



Landelijke Aanbesteding Nautische Radars Vraag Specificatie Eisen (VSE)

Description of

Supply Radar Installations of category Offshore

Case number: 31211138

This document has been translated to English to make it easier for non-Dutch entities to determine whether or not they want to participate in this tender. In case of contradictions between the Dutch and English variants of this document, the Dutch variant will prevail.



Colophon

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1 Introduction

1.1 Identification

The System Requirements Tender Specification [*Vraagspecificatie Systeemeisen*; VSE] is part of the tender documents of the European tender "Supply Nautical Radars", with case number 31211138. The total set of tender documents forming part of this European tender is set out in the Descriptive Document [**Beschrijvend document; BD**].

This document concerns the VSE for 'Offshore Radars'.

1.2 Purpose of this document

The purpose of this document is to list all functional and qualitative requirements that the systems and products to be supplied must satisfy.

1.3 Reader's guide

Requirements are identifiable because they are included in boxes and have unique numbers [**xxx-yyy**] and titles, both displayed in **bold text**, where the requirement is described in more detail in the following manner:

[Requirement] defines the requirement in more detail, in which the included sub-requirements are numbered to allow unique references, where:

- If reference is made to a [Requirement], this means that this must be satisfied *unconditionally* and *without reservation*. If this is not satisfied, the tender will be disregarded.
- If reference is made to a [Wish], that means that it is not required to be satisfied. Satisfying the [Wish] may result in a higher rating.

[Explanation]: (optional) provides an additional explanation of the requirement so it can be interpreted properly. These can also be references to indicate traceability, for example. Enumerations in the explanations are usually not numbered.

[Verification]: for each requirement [Requirement], it describes how verification takes place. The notation in bold text at [Verification] shows the verification method. The verification method may be supplemented by further details in non-bold text. Verification methods are described in section 1.4.

In all other respects:

- All other texts serve to introduce, explain or provide background information and context;
- The **definitions and abbreviations** should be read first so as to properly interpretate the requirements and texts. These are included in the [**VSP**];
- If the [**VSP**] is referred to, this should be construed as a reference to the [**VSP**] and all underlying documents listed in the tables as referenced documents;
- References in a specific [**XXX**] document should be interpreted as a reference to that document and all referenced documents indicated in this document and (in the relevant tables).

1.4 Verification methods

The verification methods indicated for the requirements have the meanings given below.



Method	Description
Analysis	The use of documentation data, test data, simulations, and/or calculations, or simulations under predefined conditions, to demonstrate that one or more requirements are satisfied under prescribed/defined conditions.
Certificate	If present: the submission of the certificate, or if not present: verification by an independent expert on the subject from a party authorised in this regard.
Demonstration	A qualitative representation of the functional performance of one or more requirements for the system or a component of the system through use of the system.
Document check	Assessment of the content of documents such as system descriptions, design documents, test and measurement reports, drawings, diagrams etc. in terms of completeness, consistency, correctness and in accordance with the requirements specified. These may be standard documents.
Inspection	Visual inspection of the delivery for completeness and absence of (external/internal) damage.
Test	Methodical approach, through the performance of test procedures, to demonstrate that the system satisfies the requirements specified.

1.5 Definitions

Please see the **[VSP]** for the glossary.

English terms from **[IALA1111]** are also used in the Dutch text to avoid any ambiguities due to translations of these terms.

1.6 Abbreviations used

Please see the **[VSP]** for the list of abbreviations.

1.7 Referenced documents

Normative documents are documents that contain requirements for functionality, technology, process control and services to be supplied. These documents form an integral part of the contract. The following documents are normative:

Identifier	Name
[BD]	Descriptive Document 'European tender by public procedure for the supply and commissioning of nautical radars' case number 31211138, date July 21 st 2025, version number 1.0
[BIO]	Government Information Security Baseline (<i>Baseline Informatiebeveiliging Overheid</i>), 2020 version 1.04 https://bio-overheid.nl/media/13kduqsi/bio-versie-104zv_def.pdf



Identifier	Name
[CAT010]	EUROCONTROL Specification for Surveillance Data Exchange Part 7: Category 010 Transmission of Monosensor Surface Movement Data, SUR.ET1.ST05.2000-STD-07-01, edition number 1.1, edition data March 2007.
[CAT034]	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 2b Category 34 Mono Radar Service Messages, Edition: 1.29, Edition date: 15 March 2021, Reference no.: EUROCONTROL-SPEC-0149-2b
[CAT048]	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Part 4 Category 048 Monoradar Target Reports, Edition: 1.31, Edition date: 03/10/2022, Reference no.: EUROCONTROL-SPEC-0149-4
[CAT240]	EUROCONTROL Specification for Surveillance Data Exchange Asterix Category 240 Radar Video Transmission. Document identifier: Eurocontrol-spec-0149-240, edition number 1.3, edition data 13/05/2015.
[IALA1111]	G1111 Establishing Functional And Performance Requirements For VTS Systems And Equipment, edition 2.0, December 2022.
[IALA1111-3]	G1111-3 Producing Requirements For Radar, edition 1.0, December 2022.
[IRSIDD]	Interface Requirements Specification / Interface Design Description Nautical Radar (Radar Distribution Layer RDL), Nautical Radar Asterix Cat 240, date 01/06/2023, version number 1.6
[KNMI wind atlas]	Home Dutch Offshore Wind Atlas
[VSP]	Request Specifications Process (VSP) Supply Nautical Radars, case number 31211138, date July 21 st 2025, version number 1.0



2 Background

2.1 General

The Contracting Authority intends to make purchases for new locations. This VSE describes the specifications for radar systems of the 'Offshore radars' category.

2.2 Radar technology

The Contracting Authority expressly has no preference for certain technologies. These include, but are not limited to, technology such as a magnetron, solid-state and/or phased array. If a requirement specifies a component or feature of a radar that applies only to a particular type of radar, that requirement applies only when that type of radar is offered.

2.3 Area of interest

The radar systems are almost all intended for locations at the North Sea, Wadden Sea and possibly along the coast of the Netherlands and new offshore locations at the North Sea.

The offshore radar systems are primarily used by the Coast Guard and are also deployed for secondary purposes where possible.

The offshore radars are all located on the Dutch continental shelf where KNMI's wind atlas **[KNMI wind atlas]** displays wind forecasts at various altitudes. This is the wind area with severe winds with high peak loads.

The coastal radars are all located within Wind Area I according to **[NEN1991]**. This is the wind area with the heaviest winds on land in the Netherlands.

2.4 Overview of the system chain

The radar systems are to be connected to RWS's VTS system. The radar systems are also to be connected to the Radar Distribution Layer (RDL). This distribution layer handles the distribution of radar data to external parties through the ASTERIX open interface.

RWS uses Monitoring tools to monitor the functioning of the radars. Monitoring tools communicate with the radar system via SNMP and are connected to the Monitoring Distribution Layer (MDL). The figure below shows the category A radar system with the interface to other systems. The "Radar Management tools" refer to tools provided by the Contractor within the scope of this contract.

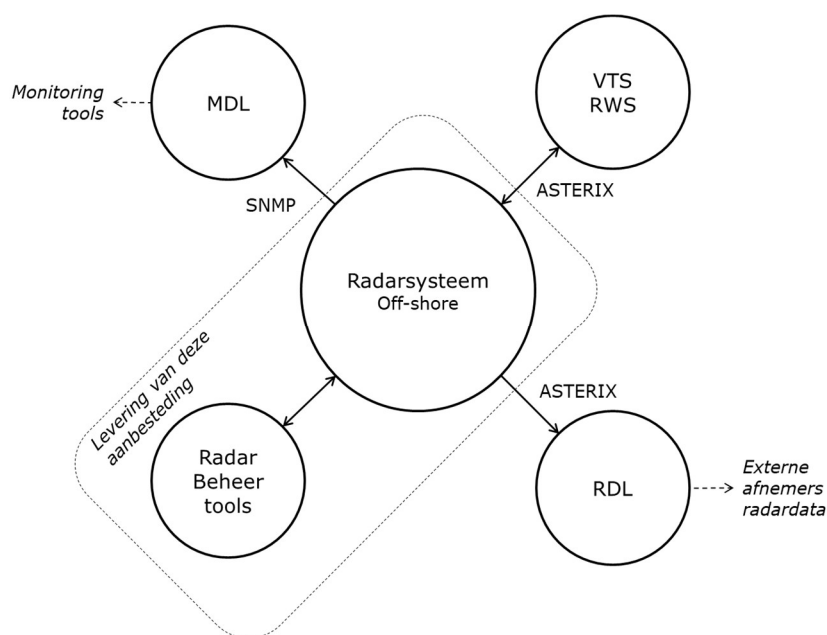


Figure 4 - System context - Offshore radar

2.5 Radar Coverage

The radars will become part of the radar coverage plan.

The radar coverage plan is under development and is constantly being updated, this will be defined per request and/or situation. At the time of the tender of the framework agreement, it is not yet known where, when and what types of radars will be installed. This is indicated in further agreements.

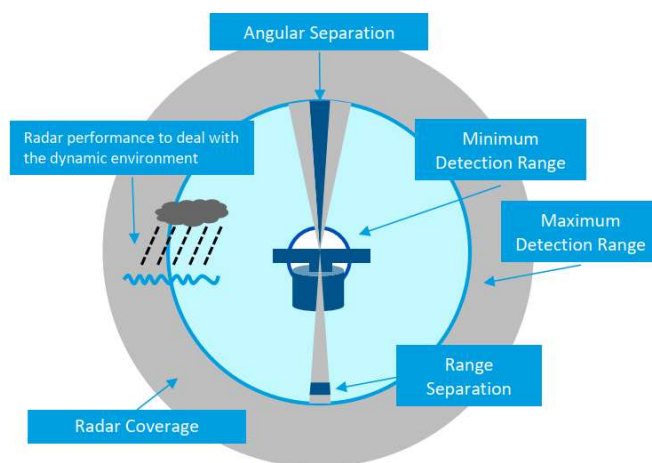
3 Functional requirements

3.1 General

IALA Guideline G1111-3 Producing requirements for Radar (December 2022) provides representative specifications for VTS radars. The present VSE elaborates these specifications from the IALA Guideline for the 'Offshore radar' category, as described in more detail in paragraph 2.3.

The figure below from **[IALA1111-3]** shows terms used in the following paragraphs. For the specification of *Target Types*, please see **[IALA1111-3]** paragraph 1.2. For *Sea State*, the classification of H.P. Douglas is used.

All specifications in this chapter are bundled in requirement VSE-100 (paragraph 4.2). Note that VSE-100 requires that at least one configuration of the radar must simultaneously meet all specifications in Chapter 3.



The radar should provide 360° visibility unless explicitly stated otherwise.

3.2 Minimum Detection Range

Minimum detection range: ≤ 1000 m. The radar system should be able to detect targets from 1000 m (≈ 0.54 NM), assuming an antenna set-up height of 100 m ASL.

Note: the Contractor must take into account that the distance between antenna and equipment in RWS's conditioned room is between 60 and 80 metres. There is no outdoor cabinet available to place equipment closer to the radar antenna.

3.3 Maximum Detection Range

The maximum detection range, with a detection rate of at least 80% (≥ 0.8) and a probability of false detection of no more than 10^{-4} , is:



	IALA Target type 2	IALA Target type 5
Sea state 3 4 mm/h rain Antenna height 100 m ASL	≥ 14.5 NM (≈ 26 km)	≥ 25 NM (≈ 46 km)

This specification applies to the processing (at least up to plot extraction) that is present in the radar.

3.4 Angular Separation

This refers to the discernment, or the resolution transverse to the viewing direction of the radar. The angular separation requirement applies to the entire detection range of the radar system.

Angular separation resolution	
<i>Smaller or equal to [m] (-3dB value)</i>	
Angular separation	≤ 18 metres at 1 NM distance
	≤ 91 metres at 5 NM distance
	≤ 181 metres at 10 NM distance
	≤ 362 metres at 20 NM distance
Calculation method:	[IALA1111-3] A.6.1. Angular separation, table 11: azimuth separation incl. sampling inaccuracies
Explanation	This refers to the discernment between two targets of the same target type at equal distance.

3.5 Range Separation

This refers to the discernment in distance, or the resolution transverse to the viewing direction of the radar. This is affected by the applied (compressed) pulse duration and the radar grating cell size in the viewing direction. The range separation requirement applies to the entire detection range of the radar system.

Range Separation	
<i>Smaller or equal to [m] (-6dB value)</i>	
River radar	
Range Separation	≤ 18 m at 0 to 5 NM distance
	≤ 53 m at 0 to 5 NM distance
Calculation method:	[IALA1111-3] A.6.2. Range Separation
Explanation	This refers to the discernment between two targets of the same IALA target type. The calculation methodology in IALA G1111-3 also considers the influence of radar grating cells on range resolution.



4 System requirements

4.1 Components

VSE-001	Components of the radar system
Requirement	The Contractor must supply a complete radar system.
Explanation	<p>A complete radar system is an installation capable of generating, transmitting and receiving radar signals, including processing systems to convert the received signals into a radar data stream.</p> <p>Set-up points, pedestals, power supply, network etc. are not part of the radar system to be supplied. The Contractor does need to supply radar-specific cables and accessories (such as fasteners), see also requirement VSE-610.</p>
Verification	Document check

4.2 Quality of radar data

VSE-100	Functional requirements
Requirement	The radar system must simultaneously comply with all specifications in chapter 3 of this VSE, within the scope described in chapter 2.
Explanation	Explanation of 'simultaneously': all specifications are assessed in conjunction. At least one configuration of the radar must simultaneously meet <u>all</u> specifications in Chapter 3.
Verification	Document check, Demonstration

VSE-101	Filter
Requirement	<p>Functionally, the following is expected from the radar system. The radar processing must in any case have filtering for:</p> <ol style="list-style-type: none">1. Noise suppression;2. Interference suppression;3. Wave clutter suppression;4. Rain clutter suppression. <p>In addition:</p> <ol style="list-style-type: none">5. Filtering must be adjustable;6. Filtering must automatically adapt to environmental conditions.
Explanation	<p>Interference suppression refers to interference from other radar systems.</p> <p>Automatic adjustment of filtering can apply to rain clutter suppression, for example. The degree of filtration then depends on the amount of rainfall.</p> <p>It is preferred that filtering setting can be stored in profiles.</p>
Verification	Document check, Demonstration

VSE-102	Plots and tracks
Wish	The radar system must be able to calculate plots and tracks from raw data.



Explanation	RWS firstly wants plots and tracks to be calculated in the underlying processing system, based on ASTERIX CAT240 data provided by the radar system. RWS wants to keep the option of having plots and tracks calculated by the radar system open. Requirement VSE-520 describes sending plots and tracks from the VTS to RWS.
Verification	Demonstration

VSE-104	Refreshing radar data
Requirement	The radar system should refresh radar data at a time interval not exceeding 6 seconds.
Explanation	This refers to the radar update rate as explained in Table 13 of [IALA1111-3] .
Verification	Document check

4.3 Technical parameters

4.3.1 Radar technology

VSE-200	Designated frequency space
Requirement	The radar system must limit the transmission of radio waves to the frequency space designated to RWS of 9.0 GHz to 9.5 GHz. A supplementary agreement may exclude the frequency range from 9.2 GHz to 9.3 GHz. In this case, the radar system should limit radio wave transmission to the frequency ranges of 9.0 GHz to 9.2 GHz and 9.3 GHz to 9.5 GHz.
Explanation	<u>All</u> frequencies used to transmit electromagnetic waves, in full bandwidth, must fall within the designated frequency range of 9.0 GHz to 9.5 GHz. This frequency space was designated in the National Frequency Plan (NFP) by the Dutch Authority for Digital Infrastructure for the Ministry of Infrastructure and Water Management for the purpose of radio navigation (VTS). The frequency space from 9.2 GHz to 9.3 GHz is shared with the Ministry of Justice. For certain areas, the Ministry of Justice may be given priority use of frequency space.
Verification	Document check

VSE-201	EMC
Requirement	The radar system is protected against external electromagnetic influences.
Explanation	Radars must comply with the generally applicable CE standards.
Verification	Document check

VSE-202	Outdoor cabinet
Requirement	There will be no outdoor cabinet, so that the Contractor must take into account that the distance between antenna and equipment in RWS's conditioned room is between 60 and 80 metres.



Explanation	An outdoor cabinet requires an air conditioner which is subject to maintenance. At the intended locations, this is not desirable, see also the requirements in paragraph 4.7 'Installation and maintenance'.
Verification	Document check, Demonstration

VSE-203	Interfering radar installations
Requirement	The radar system should be configurable in such a way that mutual interference and interference with nearby radar installations of the same brand and type can be mitigated.
Explanation	-
Verification	Document check

4.3.2 Format

VSE-210	Climatic conditions
Requirement	The part of the radar system placed in the outdoor environment should be able to withstand Dutch climatic conditions, as far as applicable within the area of interest mentioned in chapter 2: a.o. humidity, sea, salt, temperature and wind. The radar system will continue to function at temperatures between -20°C and +55°C.
Explanation	The part of the radar system placed in the outdoor environment should be able to withstand Dutch climatic conditions.
Verification	Document check

VSE-225	Peak wind load
Requirement	The radar system must be able to physically withstand hurricanes (up to and including 12 Bft) with extreme wind gusts that can be expected based on the height and location of the radar system, as specified in [KNMI wind atlas] .
Explanation	It is not required that an antenna (if applied) can still rotate during this peak load. For 'representative height' see paragraph 3.2.
Verification	Document check

VSE-226	Wind load operational radar system
Requirement	The radar system remains fully operational and available up to and including 10 Bft taking into account the representative height of the radar system and location, as specified in [KNMI wind atlas] .
Explanation	10 Bft roughly corresponds to wind speeds of 100 km/hour. For 'representative height' see paragraph 2.3.
Verification	Document check



VSE-230	Protection against weather influences
Requirement	The radar should be protected from external weather conditions.
Explanation	The radar antenna is demonstrably protected from weather influences and other external threats, belonging to the area of interest (paragraph 2.3), which will greatly increase its availability and sustainability.
Verification	Empirical figures, Document control, Inspection

VSE-231	Mounting materials, maritime conditions
Requirement	All mounting materials will be of stainless material of at least stainless steel 316L quality, resistant to maritime conditions, so that corrosion resistance is guaranteed for a period of at least 25 years (subject to VSE-210). Applied materials are supplied with a (316L) certificate. If different conductive materials are involved, insulation measures should be in place to prevent electrolytic corrosion.
Explanation	Plastic materials are allowed but should also last at least 25 years.
Verification	Document control, Inspection

4.3.3 Security

VSE-240	Fire-resistant materials
Requirement	Fireproof, halogen-free and flame-retardant materials should be used for the construction of the radar system. In case of fire, these materials should not emit any toxic substances.
Explanation	With regard to cables in offshore environments, specific norms and standards apply. The most important standard is NEK 606, which sets requirements for the properties of offshore cables, such as mud resistance, halogen-free, and fire resistance or flame retardant. There are also IEC standards such as IEC 60332-3 and IEC 60331 that deal with the fire resistance and flame resistance of cables.
Verification	Document check

VSE-245	Preventing radioactive radiation
Requirement	The radar system may not contain any radioactive substances, materials or components.
Explanation	-
Verification	Document check

VSE-246	Safe-to-touch radar system
Requirement	The radar system should be installed in such a way that it is safe to touch.
Explanation	By providing conductive parts on the outside of a radar system with earthing points, earthing on the mass of the structure can be achieved.



Verification	Document check
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4.3.4 Preventing environmental nuisance

n/a

4.3.5 Environment

VSE-260	Recyclability of materials
Requirement	The equipment and materials used must be recyclable. Materials that result in hazardous and/or toxic substances during waste processing may not be used. In this context, it must be possible to dismantle the various equipment and materials in such a way that separate waste processing is possible.
Explanation	Different parties can arrange for the waste processing, specifically with regard to the materials for components and equipment. This means that the material, when decomposed, will be separated to facilitate the different types of waste processing.
Verification	Document check

4.4 ICT security

VSE-300	Management functionality authentication
Requirement	Access to the management functionality must be secured by means of authentication.
Explanation	Management functionality comprises every activity influencing the functioning of the radar, including the start, cancel and modification of the configuration.
Verification	Document check, Demonstration

VSE-301	Passwords
Requirement	The authentication listed under VSE-300 must satisfy the following requirements: <ol style="list-style-type: none">1. Having a strong password is an obligation;2. Passwords may not be reusable;3. Default passwords must be changed on first use.
Explanation	A "strong password" refers to the definition used in [BIO] : "If no two-factor authentication is used, the password length must be at least 8 characters and complex. The complexity requirement lapses if the password is 20 characters long.
Verification	Document check

VSE-303	Blocking network services and ports
Requirement	The radar system must limit communications to necessary network services and ports: <ol style="list-style-type: none">1. Non-necessary data network services must be able to be switched off;2. Access to unused ports must be able to be blocked.
Explanation	Ports refers to any physical interface with the system, so this also includes USB ports.
Verification	Document check



VSE-304	Logging
Requirement	The radar system must retain management activities in a log for a period of up to 8 days.
Explanation	Logged activities concern security. This concerns, for example: <ul style="list-style-type: none">• Logging in (time, username)• Changing parameters• Turning on and shutting down the radar system.
Verification	Document check, Demonstration

VSE-305	Access to log
Requirement	The log must only be accessible through the management interface.
Explanation	The log referred to here is the log from requirement VSE-304.
Verification	Document check, Demonstration

4.5 Integrity

VSE-401	Mean Time Between Critical Failure
Requirement	The radar system must have a minimum Mean Time Between Critical Failure (MTBCF) of at least 35040 hours (four years). This MTBCF is based on a preventive maintenance frequency of once a year.
Explanation	Definition MTBCF: a failure that, either in full or in part, shuts down the functioning of a system or component, because of which the normal function or service can no longer be performed. Given the high cost and complex planning involved in offshore repair work, corrective maintenance is highly undesirable.
Verification	Document check

VSE-402	Duration of corrective maintenance
Requirement	In the event of a critical failure, resulting in a radar system no longer meeting radar coverage requirements, corrective maintenance on site should take no more than <u>four hours</u> .
Explanation	This time does not include the collection of the necessary tools and parts and staff travel time to and from the OSSs. Maintenance should be performed as much as possible by replacing parts in the form of LRUs (line replaceable unit) rather than repairing them, see also requirement VSE 613 - Corrective maintenance: repair by replace. These are small parts weighing up to 25 kilograms. For the larger and heavier component (e.g. replaced radar beam/plate) requiring lifting operations, this requirement does not apply. A plan of action will be drawn up with all stakeholders for this purpose.
Verification	Document check, Demonstration



4.6 Data interface

VSE-500	Multiple LAN ports
Requirement	The radar system must provide at least two independent data interfaces suitable for data communication in separate VPN environments. The radar system must have at least two RJ-45 LAN ports for this purpose.
Explanation	For security reasons, RWS wants radar data communication and communication for management purposes to take place in separate environments.
Verification	Document check

VSE-503	Multiple receivers of radar data
Requirement	The radar system must be able to send radar data to multiple receivers through the same LAN port through a logical separation of data traffic from that LAN port.
Explanation	RWS wants to be able to send radar data to multiple receivers.
Verification	Document check

VSE-510	Unicast
Requirement	The radar system must only make use of unicast when communicating on the RWS network.
Explanation	If the radar system comprises multiple components communicating internally, the limitation only applies to communication that uses the RWS network NNV. The limitation does not apply to mutual communication outside of the NNV.
Verification	Document check

VSE-511	Data compression
Requirement	The radar system must offer compressed (lossless) video data to the back-end RWS processing systems.
Explanation	<p>For video data in the ASTERIX protocol this refers to compression as defined for CAT240 Data Item I240/048, see [CAT240].</p> <p>The Contractor indicates the compression used in the interface specifications of the radar system.</p> <p>The Contracting Authority prefers to compress the data with zlib.</p>
Verification	Document check, Demonstration

VSE-520	ASTERIX
Requirement	The new radar system must be appropriate and read for data communication on the ASTERIX open interface for CAT240 "Radar video". The messages must meet the [IRSIDD] requirements.



Explanation	<p>The Interface Requirements Specification / Interface Design Documentation [IRSIDD] describes how RWS uses ASTERIX to exchange radar video data. The radar system messages must correspond with this so they can be incorporated by the RWS (RDL) Radar Distribution \layer without adjustments.</p> <p>ASTERIX message types other than CAT240 are not a requirement, but are desired:</p> <ul style="list-style-type: none"> • CAT010 – Tracks • CAT048 – Mono Radar Target Reports • CAT034 – Monoradar service message • CAT062 – SDPS Track Messages • CAT253 – Remote Station Monitoring and Control Information
Verification	Document checks, Analysis, Demonstration

4.7 Installation and maintenance

VSE-610	Cables
Requirement	The radar system must be delivered with the inclusion of any radar specific cables.
Explanation	Radar specific cables are delivered by the Contractor, generic cables such as power and network cables are present or delivered by the Contracting Authority. Radar specific cables also include the wave guide, given that it is a component within the radar technique applied.
Verification	Inspection The Contractor must check whether the supply is complete before transport to a location of RWS, and must provide a checklist in this respect. This checklist must take into account the required cable length(s) for the specific target location.

VSE-611	Threadlockers and lifting equipment
Requirement	The radar system must be delivered including the following provisions for installation: <ol style="list-style-type: none"> 1. Locking mechanisms for mounting with the new drives; 2. Lifting tools and provisions on the drives.
Explanation	Threadlockers and lifting equipment are certified and the certificate is provided by the Contractor.
Verification	Inspection The Contractor must check whether the supply is complete before transport to a location of RWS, and must provide a checklist in this respect. This checklist includes the threadlockers and lifting equipment.

VSE-613	Corrective maintenance: repair by replace
Requirement	It must be possible to repair a defective radar system on site by replacing the defective part with a spare part.
Explanation	Repair by replace contributes to higher availability by reducing the Mean Time To Repair. Think of components such as antenna, turning unit and magnetron (to the extent that they are applicable to the chosen radar technology). A modular design of the radar system allows maintenance through repair by replacement.



Verification	Document check, Demonstration
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VSE-615	Maintenance efficiency
Requirement	All applied components, equipment, etc., for preventive and corrective maintenance: <ol style="list-style-type: none"> 1. Are easily accessible; 2. Do not require special protective clothing; 3. Can be performed using standard tools and resources or using tools and resources provided by the supplier.
Explanation	-
Verification	Documentation check, Demonstration

VSE-616	Function failure due to preventive maintenance
Requirement	Functional failure of the radar system must be limited to a maximum of 4 hours per year when performing preventive maintenance.
Explanation	This refers to scheduled maintenance as prescribed by the supplier.
Verification	Documentation check

VSE-619	Power supply of the antenna system drive
Requirement	The drive of a rotating antenna system (if applied) should be equipped with a three-phase voltage 400 V / 50 Hz connection with a power consumption of up to 5 kW. A single-phase 230 V / 50 Hz connection for the antenna system with a maximum connection rating of 16 amps is allowed.
Explanation	The new radar system will be connected to (and powered by) the existing power supply with a local switch-off capability (isolation switch) and a remote switch-off capability (remote switch).
Verification	Document check, Demonstration

VSE-620	Power supply transceiver coastal and off-shore
Wish	The transceiver technology should have a single-phase voltage 230 V / 50 Hz connection with a power consumption of up to 1300 W.
Explanation	-
Verification	Document check

VSE-622	Technical lifetime
Requirement	System components must not wear or age to the extent that replacement is necessary for a period of at least 10 years after being put into use.
Explanation	This is the time period without overhaul. This requirement does not apply to a mechanical transmission (such as a gear drive).
Verification	Document check



VSE-623	Replacement and overhaul of components
Requirement	All components of the radar system must be available for replacement by the supplier for a period of at least 15 years after the commencement of this agreement and must be suitable for overhaul by the supplier.
Explanation	The Contracting Authority determines whether a component will be overhauled or replaced by the supplier.
Verification	Document check

VSE-625	Low maintenance
Requirement	It must be possible to limit the preventive maintenance of the radar system to once a year or less.
Explanation	The radar system is low maintenance.
Verification	Document check

VSE-626	Transport of material, tools and personnel
Requirement	Material, tools and personnel will mainly be transported by helicopter. The size and weight of components of the radar system must be suitable for transport by helicopter.
Explanation	Transport to the radar location will take place by helicopter. The Contractor must take into account that spare materials and tools will be delivered and picked up by helicopter.
Verification	Demonstration

4.8 Monitoring & Control

VSE-700	SNMP
Wish	The radar system must support SNMP version 3 or higher.
Explanation	SNMP traps automatically report the condition of the radar system through the RWS network.
Verification	Demonstration

VSE-701	Monitoring – basic
Requirement	<p>For management purposes, the radar system must continuously make the status information (provided by the supplier) available on the data communication interface. The data to be monitored in any event include:</p> <ol style="list-style-type: none">1. Rotating of antenna on/off (if applicable);2. Transmittance of radar data active/non-active;3. Condition and error messages. <p>The data communication interface is open and documented, allowing the Contracting Authority to have interfaces developed in client systems.</p>



Explanation	Reporting deviations and malfunctions (and acting on them) allows the radar system to be kept in operation within the supplier's specification
Verification	Demonstration

VSE-702	Monitoring – Jamming and SART
Wish	It should be possible to monitor the performance of the radar system remotely, either through a web browser or through applications provided by the Contractor. The radar system must send data on: <ol style="list-style-type: none">1. Jamming (or suspicions of jamming)2. SART signals.
Explanation	-
Verification	Demonstration

VSE-703	Local and remote control
Requirement	It must be possible to set up and maintain the radar system both locally and remotely (remote control over the network). This in any event includes: <ol style="list-style-type: none">1. Starting and stopping the radar system;2. Configuring parameters;3. Performing software updates.
Explanation	Software update patches must always be able to be installed and configured remotely. It is preferable that port numbers of message traffic is configurable.
Verification	Demonstration

VSE-705	Health status
Requirement	Health status is continuously monitored remotely. To this end, the radar system must continuously provide data.
Explanation	Real-time condition monitoring and health assessment are of great interest to ensure the (safe) operation of radar antenna system. In addition, the offshore radar locations are very difficult to reach, so the radar system is permanently fully diagnosed remotely, so that the condition of the radar is known and it is clear which components need to be taken offshore for corrective and preventive maintenance.
Verification	Demonstration