

**This and the following 49 pages comprise Schedule 4 referred to in the foregoing Contract between the Scottish Ministers and Serco Ltd.**

**SCHEDULE 4 – VESSELS**

**Part A: Specification of Vessels**

1.1. NOT USED.

**Part B: Operator's Obligations in Relation to the Vessels**

1.2. The Operator will provide Vessels that are adequate to the Services.

**Interpretation**

1.3. References herein to the Vessel apply to each and/or all of the Vessels, as appropriate. References herein to the Fleet Bareboat Charterparty Agreement apply to the Fleet Bareboat Charterparty Agreement entered into in respect of the relevant Vessel and/or to all of the Fleet Bareboat Charterparty Agreement as appropriate.

**Information and Compliance Undertakings**

1.4. The Operator must throughout the Grant Period and so long as any obligations are owing by the Operator in terms of the Contract:

- (1) comply with the terms of the Insurances at all times;
- (2) comply with the provisions of the Fleet Bareboat Charterparty Agreement at all times;
- (3) ensure that at all relevant times all licences, approvals, consents and permits required under Applicable Law which are (i) required for the use and operation of the Vessel, and (ii) the absence of which would either expose the Scottish Ministers to any risk of any liability or expose the Vessel to any material risk of arrest, detention or sale, are, in each case, obtained and maintained in full force and effect;
- (4) furnish the Scottish Ministers promptly with all such information as they may from time to time reasonably require regarding the Vessel, her insurance, condition, maintenance, particulars of all towages and salvages; and

(5) comply with all undertakings given by it in the Fleet Bareboat Charterparty Agreement as set out in full in this Schedule 4.

### **Protection of Scottish Ministers' Rights**

1.5. The Operator must throughout the Grant Period and so long as any obligations are owing by the Operator in terms of the Contract:

(1) not sell or attempt to sell, agree to sell, transfer or otherwise dispose of or (except to avoid loss of life or personal injury) abandon the Vessel, or any share or interest therein;

(2) promptly pay and discharge or procure that there are paid or discharged all debts, damages, liabilities and outgoings whatsoever which have given or may give rise to statutory, possessory or maritime liens on, or claims enforceable against, the Vessel or the Insurances or any part thereof and, in the event of the Vessel being arrested, seized or detained or the Insurances or any part thereof being arrested, attached or levied upon pursuant to legal process or purported legal process procure the release of the Vessel and the Insurances from such arrest, attachment or levy within 10 Business Days thereof; and

(3) notify the Scottish Ministers promptly by facsimile or e-mail of any arrest, seizure or detention of the Vessel or any exercise or purported exercise of an arrest, attachment, lien or other claim on the Insurances or any part thereof.

### **Possession**

1.6. The Operator must not at any time without the prior consent of the Scottish Ministers and, if such consent is given, only subject to such conditions as the Scottish Ministers may impose, part with the possession or operational control of the Vessel.

### **Title, Registration and Name**

1.7. The Operator must during the Grant Period do all that may be necessary on its part to maintain in force the registration of the Vessel as a European ship. The Operator will not do, or knowingly or recklessly suffer to be done, anything whereby the registration of the Vessel will be forfeited or imperilled.

1.8. The Operator must not without the prior consent of the Scottish Ministers (and then only on and subject to such terms as the Scottish Ministers may agree) change the name of the Vessel.

1.9. Throughout the Grant Period the Operator must not create or agree or purport to create any encumbrance over the Vessel, any share or interest therein or in the Insurances or requisition compensation or any part thereof (other than with the prior consent of the Scottish Ministers).

### **Maintenance and Operation**

1.10. The Operator must throughout the Grant Period:

(1) at its sole cost and expense maintain the Vessel and every part of the Vessel (which includes any Transferring Assets on or fixed to the Vessel) and keep it in a good and efficient state of repair and safe operating condition, seaworthy in all respects and in accordance with good maintenance practice (fair wear and tear excepted and having regard to the age and type of the Vessel) on a non-discriminatory basis with other vessels owned and/or operated by the Operator and in accordance with good industry practice for United Kingdom ferry operators and procure that all repairs to, or replacement of, any damaged, worn or lost parts or equipment are effected in such a manner (both as regards workmanship and quality of materials) as not to diminish the value of the Vessel and (without prejudice to the generality of the foregoing) the Operator must ensure that at all times:

(a) the Vessel maintains the classification of the Vessel with the relevant Classification Society and to the extent any additional class notations are registered or proposed for registration with the Classification Society, the Operator must ensure that the Vessel maintains such additional class notations in compliance with the requirements of the Classification Society provided that any such additional class notations are consistent with the specification of the Vessel;

(b) the Vessel complies with all other regulations and requirements (statutory or otherwise) from time to time applicable to vessels registered in the Flag State or otherwise applicable to the Vessel, her Master, officers and crew (including without prejudice to the foregoing generality in relation to the number of crew) wherever the Vessel may proceed or trade and (without prejudice to the generality of the foregoing) at its own expense maintain in force for the Vessel all safety, radio, loadline and other certificates whatsoever and all licences and permits which may from time to time be prescribed by any legislation in force in the Flag State, any relevant port state or other applicable jurisdiction;

(c) ensure the Operator complies at all times with any terms of the Insurances relating to the condition or inspection of the Vessel.

(2) permit the Scottish Ministers by surveyors or other persons appointed by them for such purpose to board the Vessel at all reasonable times (but no more than twice in any year during the Grant Period other than in circumstances where an Event of Default has occurred) for the purpose of inspecting her, including giving access to such persons to the Master's Log and afford all proper facilities for such inspections and for this purpose give the Scottish Ministers reasonable advance notice of at least 30 days of any intended drydocking (or other underwater inspection of the Vessel) of the Vessel (whether for the purpose of classification, surveyor otherwise) and the Scottish Ministers will be entitled to be represented at such dry dock. The proper and reasonable costs of such inspections and surveys must be paid by the Operator. All inspections and surveys of the Vessel will be carried out at such times and in such places and in such manner as to minimise delaying the use and operation of the Vessel, but the Scottish Ministers will not be obliged to carry out such inspections only during periods of drydocking;

(3) notify the Scottish Ministers forthwith upon becoming aware of the same by facsimile transmission thereafter confirmed by letter and in reasonable detail of:

(a) the hijacking, confiscation, seizure, impounding, arrest, taking in execution, forfeiture or detention of the Vessel or any major part thereof or any requisition for hire at any time of the Vessel;

(b) any requirement or recommendation made by the Classification Society or by any insurer or any competent authority which is not, or cannot be, complied with in accordance with its terms;

(c) any death or serious or potentially serious injury to a third party or substantial damage to property, caused by, or in connection with, the Vessel;

(d) any single casualty or other accident or damage to the Vessel which may be or become a Total Loss (as that expression is defined in the relevant Fleet Bareboat Charterparty Agreement) or which may involve repairs or maintenance costing more than £100,000 which may affect the Services;

(e) any assistance which has been given to the Vessel which has resulted or may result in a lien for salvage being acquired over the Vessel;

(f) any collision or other accident or incident involving damage to the Vessel (the repair cost of which is likely to exceed £100,00 or the then equivalent in any other currency) and which may affect the Services;

(g) any other event which occurs in connection with the Vessel which affects or may reasonably be expected to affect the rights of the Scottish Ministers or involves or may reasonably be expected to involve any loss or liability;

(h) the occurrence of any litigation involving, or criminal proceedings against, the Operator;

(i) any notices, requirements or recommendations made by or on behalf of a governmental or statutory body or agency. This includes, but is not limited to, notices, requirements or recommendations made by or on behalf of:

(I) an Inspector under the Animal Health Act 1981;

(II) the Health and Safety Executive (HSE) or any other agency of the Health and Safety Commission;

(III) the Scottish Environment Protection Agency (SEPA);

(IV) Maritime and Coastguard Agency (MCA).

(4) in the event of a casualty or maintenance referred to in paragraph 3(d) above, the Operator will notify the Scottish Ministers orally within 48 hours of discovery and in writing within 72 hours after the discovery of the event. The Operator must notify the Scottish Ministers of the plan and time frame for rectification (if applicable) as soon as possible thereafter;

(5) maintain all such records, logs, manuals, technical data and other materials and documents which are required to be maintained in respect of the Vessel to comply with any Applicable Laws or the requirement of the Classification Society and, on reasonable advance notice from the Scottish Ministers, permit the Scottish Ministers or their representatives at any time to examine and take copies of such logs and other records;

(6) procure that the Scottish Ministers are not at any time represented by the Operator, its contractors, agents, employees, representatives and/or subcontractors as carrying goods or passengers or providing any other service on or from the Vessel or as having any operational interest in, or responsibility for, the Vessel;

(7) do or cause to be done all things necessary to comply with all national, international and state conventions and laws (and any rules and regulations thereunder) applicable to the Operator and/or the Vessel including, without limitation, the Merchant Shipping Act 1995, the International Convention for the Safety of Life at Sea (SOLAS) 1974 as amended from time to time the IMO document International Convention for the Prevention of Pollution from Ships (MARPOL) and to the extent applicable, the Oil Pollution Act of 1990 of the United States of America (including, without limitation, the requirements thereunder relating to manning and the establishment of financial responsibility), the Comprehensive Environmental Response Compensation and Liability Act of the United States of America, other federal and state laws of the United States of America and international conventions, laws, rules and regulations relating to environmental matters, including those relating to discharges of oil, petroleum, petroleum products and distillates, chemicals, pollutants and other substances and the Terrorism Act 2000;

(8) maintain an emergency response plan and undertake the appropriate exercises for training purposes.

### **Insurance Undertakings**

1.11. The Operator hereby covenants and undertakes that throughout the Grant Period it will insure and keep every Vessel insured at its own cost and expense in respect of all matters of whatsoever nature and howsoever arising in respect of which insurance would be maintained by a prudent owner of the Vessel having regard to the situation, nature and method of operation of that Vessel.

1.12. The Operator hereby covenants that it will not do, consent to or permit any act or omission which might invalidate or render unenforceable the whole or any part of the Insurances and not (without first obtaining the consent of the insurers to such employment and complying with such requirements as to extra premium or otherwise as the insurers may prescribe) employ any Vessel or suffer any Vessel to be employed otherwise than in conformity with the terms of the Insurances (including any warranties expressed or implied therein).

1.13. Apply all sums receivable under the Insurances which are paid to the Operator in repairing all damage and/or in discharging the liability in respect of which such sums have been received.

1.14. In the event of a Vessel becoming a wreck or obstruction to navigation during the Grant Period the Operator must indemnify and hold harmless the Scottish Ministers against all costs, expenses, payments, charges, losses, demands, any liabilities, claims, actions, proceedings (whether civil or criminal) penalties, fines, damages, judgements, orders or other sanctions which may be made or asserted against the Scottish Ministers by reason that the Vessel becomes a wreck or obstruction to navigation -including, (without limitation), in respect of the removal or destruction of the wreck or obstruction under statutory powers.

**Part C: Maintenance Programme for Vessels**

1.15. The Operator will maintain the Vessels as set out in the maintenance programme.

<b>Contents</b>	<b>Glossary of Terms.....</b>	<b>174</b>
	List of relevant management procedures.....	174
	<b>A1/V3 Vessel Maintenance.....</b>	<b>176</b>
	<b>1. Executive Summary .....</b>	<b>176</b>
	1.1. Serco's Approach to the Vessel Maintenance Delivery Plan.....	176
	<b>2. Introduction.....</b>	<b>177</b>
	2.1. Reviewing the current approach.....	178
	<b>3. Understanding the requirements.....</b>	<b>179</b>
	<b>4. Vessel Maintenance – V3.....</b>	<b>179</b>
	4.1. Statutory maintenance requirements.....	179
	4.1.1. RoPax vessels.....	179
	4.1.2. RoRo vessels.....	179
	4.2. Planned maintenance system.....	180
	4.2.1. Planned maintenance systems proposed.....	180
	4.2.2. Planned Maintenance System Process.....	181
	4.2.3. Unplanned Maintenance process.....	182
	4.2.4. Maintaining vessel critical systems.....	182
	4.2.5. Failure Modes and Effects Analysis of Critical Systems.....	182
	4.3. Organisational capability and technical competence.....	183
	4.3.1. Technical vessel management.....	183
	4.3.2. Vessel organisation.....	184
	4.4. Supply Chain.....	187
	4.4.1. Fuel and Lubricating Oils.....	187
	4.5. Appropriate investment.....	188
	4.6. Dry Docking of Fleet Vessels.....	189
	4.6.1. Statutory compliance.....	189
	4.6.2. Dry Docking arrangements.....	190
	4.6.3. Dry docking programme.....	193
	4.6.4. Fleet Relief for Planned Dry Dock and Unplanned Maintenance.....	195
	4.7. Potential vessel upgrades.....	196
	4.7.1. RoPax.....	197
	4.7.2. RoRo.....	199
	4.7.3. Environmental considerations.....	199
	4.7.4. Future Vessel Considerations.....	200
	4.8. Proposals for Vessel Maintenance.....	201
	4.9. Vessel Critical Systems.....	202
	<b>5. Monitoring and review.....</b>	<b>207</b>
	5.1. Use and retention of Records of Inspection (ROI).....	207
	5.2. Serious Deficiencies.....	207
	5.3. Risks and Mitigation.....	209
	<b>Appendix A1 V3-1: Vessel Details.....</b>	<b>210</b>



<b>Figures</b>	Figure 1: Planned Maintenance System Flowchart.....	181
	Figure 2: Technical vessel maintenance.....	184
	Figure 3: Crew structure for MV Hildasay and MV Helliar.....	185
	Figure 4: Crew structure for MV Hamnavoe.....	186
	Figure 5: Crew structure for MV Hrossey and MV Hjaltland.....	186
	Figure 6: Decision tree for dry docking.....	192
	Figure 7: Flow diagram showing the process for developing a dry dock specification.....	194
	Figure 8: Proposed new passenger accommodation – Hrossey.....	197
	Figure 9: Proposed new passenger accommodation – Hjaltland.....	198
	Figure 10: Non-compliance flowchart.....	208
<b>Tables</b>	Table 1: Assessment of the Challenges – Vessel Maintenance.....	179
	Table 2: Existing supplier base.....	187
	Table 3: Fuel Consumption comparison at start of contract in 2012 and at end in 2018.....	188
	Table 4: Energy Consumption Comparison at Start of Contract in 2012 and at end in 2018.....	188
	Table 6: Potential capability for fleet relief.....	195
	Table 7: Proposals for Vessel Maintenance.....	201
	Table 8: Vessel Critical Systems.....	202
	Table 9: Risk and mitigations.....	209

## Glossary of Terms

Term	Definition
CMAL	Caledonian Maritime Assets Limited
DNVGL	Det Norske Veritas Germanischer Lloyd Classification Society
ECR	Engine Control Room
EU MRV	EU Monitoring, Reporting, Verification of Co2 Emissions
FMEA	Failure Mode and Effects Analysis
IMO	International Maritime Organisation
IOPP	International Oil Pollution Prevention
ISM code	International Safety Management code
LNG	Liquefied Natural Gas
LSA	Life Saving Appliances
MARPOL Annex I to VI	Additional IMO regulations relating to pollution
MGO	Marine Gas Oil
MRV	Monitoring Repairing Verification
NCN	Non-Conformance Notice
NOx	Nitrogen Oxides
OEM	Original Equipment Manufacturer
PMS	Planned Maintenance System (AMOS / SIS)
ROI	Record of Inspection
RoPax	Roll on, roll off passenger vessel
RoRo	Roll on, roll off freight vessel
SEEMP	Ship Energy Efficiency Management Plan
SOLAS	International Convention for the Safety of Life at Sea
SOx	Sulphur Oxides
STCW 95	Standards of Training and Certification of Seafarers 1995
UPS	Uninterrupted Power Supply

# List of relevant management procedures

Redacted

- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....
- .....



# A1/V3 Vessel Maintenance

## 1. Executive Summary

### 1.1. Serco's Approach to the Vessel Maintenance Delivery Plan

The purpose of this Vessel Maintenance Delivery Plan is to demonstrate Serco's understanding of the objectives that Scottish Ministers have set for the operation of the Northern Isles Ferry Service, with respect to Vessels.

The proposed Vessel Maintenance Delivery Plan provides a comprehensive and robust approach to ensure through the Vessel Maintenance Programme that the vessels operate an efficient, reliable RoRo and RoPax ferry service. The sections below provide details of the systems and procedures. It outlines the necessary steps for satisfying all statutory requirements and explains how compliance is monitored and measured within the plan.

The Vessel Maintenance Delivery Plan is mindful of the Scottish Government's (SG) high level objectives, to:

- Be safe, sustainable and efficient
- Be resilient to social and commercial stresses
- Be aligned with Scottish Ministers Ferries Plan 2013 to 2022

The Vessel Maintenance Delivery Plan has been structured around the requirements of the ITT Vol 2 – A1-V3 as follows:

- 1) Understanding the challenges – technical, logistical and management
- 2) Approach and methodology – utilising the best practice that has been developed in the previously awarded contract
- 3) Proposals for improving operations during the new contract term

Set out below are our proposals which will form part of the agreement between Scottish Ministers and Serco and showing where there are areas of continuous improvement which will be targeted throughout the term of the contract. The areas of continuous improvement may require Transport Scotland, CMAL or third-party approvals, feasibility studies or business cases in order for them to be delivered, and thus are to be viewed as having the potential to be implemented.

Serco has an in-depth knowledge of the risks that could affect the reliability of NorthLink's ferry services, and we have identified the high-level risks and the actions required to mitigate them, or to bring them to as low a level of risk as reasonably practicable.

Costs associated with the delivery of the objectives are not included in the sections below, but they can be found in the financial model. However, where there is a requirement for additional investment or resource, this has been indicated.

Suitable evidence has been provided to support the delivery of the requirements throughout the plan, however, where this evidence is part of a larger document this has been referenced or provided in full in the supporting annex.

This element of the proposal has been developed on the basis that the levels of expenditure will support the service in a manner which provides reliability of service in line with good budgetary control. As an example, the option of cutting maintenance to the minimum level was discounted as being one which delivers early savings at the cost of considerable expenditure later to return the vessels to a reliable condition.

## 2. Introduction

The tender for the Northern Isles Ferry Services has provided the option to use alternative vessels from the ones currently in service. Serco has chosen to continue to use the existing vessels in the next Contract. The fleet has proven itself to be reliable and suited to delivering the timetable that Scottish Ministers require.

We have a high level of understanding and expertise of the maintenance requirement of the current fleet. Serco has invested substantial resource effort and analysis of vessel maintenance systems to deliver and maintain a high level of service performance and resilience. Redacted

The fleet we propose will comprise the following vessels for the Aberdeen–Kirkwall–Lerwick routes:

- MV Hrossey – RoPax passenger ferry
- MV Hjaltland – RoPax passenger ferry
- MV Hildasay – RoRo freight ferry
- MV Helliar – RoRo freight ferry

And for Scrabster – Stromness route:

- MV Hamnavoe – RoPax passenger ferry

Caledonian Maritime Assets Limited (CMAL) are providing the vessels under bareboat charter party arrangements.

These lifeline ferry services, on which Orkney and Shetland depend, require vessels that are both reliable and maintained to a high standard to assure high service resilience and continue to provide high safety and performance standards.

The Vessel Maintenance Plan is designed to:

- Meet the maintenance obligations of our charter party agreements with CMAL for each class of vessel and provide expert input to design specification or upgrades to vessels
- Provide a vessel maintenance programme that is compliant with Class and Flag State requirements
- Apply consistent standards across all vessel types

Redacted

The case study below shows Serco's extensive maritime experience:

#### Case Study

#### Serco's Maritime Experience

Serco has an extensive presence in the wider maritime sector, in addition to the current NorthLink contract. Serco Maritime Services is part of Serco's defence business unit and provides and operates 117 support vessels for the UK Royal Navy, Royal Australian Navy and International Nuclear Services. In these contracts Serco is required to meet extremely high performance and availability benchmarks across a fleet that includes vessels from 100 to 25,000 tonnes.

This depth of experience has enabled Serco in the current contract to draw on best practice vessel maintenance procedures, processes and systems, and to raise standards since 2012.

NorthLink has also been able to draw on the extensive relationships Serco has in the maritime supply chain to drive efficiency and improve supply chain resilience with machinery and equipment suppliers.

### 2.1. Reviewing the current approach

In preparing this plan Serco has worked independently with marine consultants and naval architects Redacted to review and assess the existing maintenance arrangements and

how these can be further improved in the new contract. These include plans and programmes for both planned and unplanned repair maintenance requirements.

We have carried out visual inspections with CMAL during site visits to include:

- Underwater areas and topside inspection during dry dock of Hrossey and Hjaltland
- In-water topside inspections of Hamnavoe, Hildasay and Helliær

All of the above will have included:

- Public areas
- The Ship's Bridge
- Machinery spaces
- Accommodation
- Underwater areas

We have validated compliance with maritime legislation and inspected and reviewed existing records on maintenance.

Serco's approach to vessel maintenance has resulted in high levels of performance and reliability with minimal disruption through the life of the current contract. Redacted

Serco has met with CMAL to confirm their expectations for the standard of maintenance and upkeep. The feedback from CMAL has confirmed the vessels meet their expected standards and that the new operator will maintain this standard throughout the life of the new contract. Our well-structured maintenance programme gives us confidence that we will continue to meet this requirement.

### 3. Understanding the requirements

Table 1: Assessment of the Challenges – Vessel Maintenance

Technical	Maintaining the fleet of vessels for high service reliability and performance through and beyond the life of the contract Accommodating additional survey and inspection and docking requirements; usable life; increase in maintenance load; ageing equipment or obsolete equipment; environmental impact improvement and efficiency
Logistical	Maintaining service levels with port facilities available; shutting of ports and alternative berthing; geographic location
Management	Ensuring contact is maintained with such a geographically diverse operation

### 4. Vessel Maintenance – V3

This section describes how Serco will manage vessel maintenance to ensure the safe and reliable delivery of the Service. Essential to achieving this is a focus on budgetary control and investment planning, which covers:

- Statutory maintenance requirements
- Planned and unplanned maintenance
- Vessel upgrades – owners, statutory, operators
- Organisational capability and technical competence
- Supply chain management

#### 4.1. Statutory maintenance requirements

The NorthLink fleet consists of two vessel types that have different mandatory maintenance requirements as determined by their Classification Society – Det Norske Veritas Germanischer Lloyd (DNV-GL).

We are compliant with the regulations and standards of the Flag State (Maritime and Coastguard Agency (MCA), Isle of Man Ships Register (IoMSR) and Classification Society.

##### 4.1.1. RoPax vessels

The RoPax fleet are Hamnavoe, Hjaltland and Hrossey. At the time of bidding there are no known conditions of Class. General particulars are as follows:

- **Age** – 17 years - built 2002
- **Class** – Lloyds 100 A1, RoRo cargo / passenger ferry
- **Ferry capacity** – passengers: 600; cars: 125 for Hjaltland and Hrossey; passengers: 600; cars: 95 for Hamnavoe

##### 4.1.2. RoRo vessels

The RoRo fleet are Hildasay and Helliær. At the time of bidding there are no known conditions of Class. General particulars are as follows:

- **Age** – Hildasay: 23 years (1996) and Helliær: 22 years old (1997)
- **Class** – DNV-GL 1A1 general cargo carrier RoRo container ice (1A)
- **Ferry capacity** – passengers: 12; trailers: 88



These RoRo vessels will be nearing the end of their usable life within the new contract term. We are expecting CMAL to outline their plans for replacement or life extension in the early stages of the new contract. For full vessel details see Appendix A1 V3-1.

## 4.2. Planned maintenance system

The International Safety Management Code (ISM) requires each vessel to have an approved Planned Maintenance System (PMS) to meet its safety and environmental objectives and as an investment to protect assets and optimise management. The PMS is audited annually by the Flag State (MCA, IOMSR).

The PMS captures a complete database of machinery, equipment and fittings on the vessels and sets out the periodic maintenance demands for each category. Complying with Class and manufacturer requirements and all applicable regulations, the system enables the vessel's Chief Engineer and Chief Officer to plan, perform and document vessel maintenance at intervals, recording maintenance activity against each of the tasks, to ensure safe and reliable vessel operations. This allows access to detailed analytical data of the vessel status, i.e. technical performance, accuracy of inventory and the state of defect list. In turn, this provides the management team onboard and ashore with the means to monitor and guide safety activities and to deliver greater fleet efficiency and associated cost reductions.

### 4.2.1. Planned maintenance systems proposed

Serco will continue to use two software systems:

Redacted

Redacted

The PMSs are set up with details of all components on each vessel and maintenance tasks relevant to them, based on the equipment manufacturers' recommendations. The PMS includes cross-reference to specific sections of these numbered technical manuals to provide guidance on where our vessel maintenance staff can find detailed maintenance task information. The PMS is set up with a summary of the tasks for quick reference.

Maintenance tasks are detailed for those components where maintenance demand is based on operating hours set by the Original Equipment Manufacturer (OEM), i.e. main and auxiliary machinery. Whereas those based on a calendar period are defined by regulations or guidelines, i.e. life-saving appliances (LSA), fire-fighting equipment (FFE).

Although much of the vessel maintenance activity will be routine service and inspection designed to keep vessels operating in good condition, Redacted

The PMS will schedule routine maintenance activities and provides our vessel maintenance teams with visibility on the status and condition of machinery and equipment on the vessel. It will also be used to document defects and ensure that there is full traceability, from discovery to defect rectification. As an audit tool, our PMSs will enable us to plan for preventative maintenance tasks and identify any repeated maintenance issues that are out of scope of

equipment or machinery manufacturer tolerances. This is a powerful tool to investigate underlying cause-and-effect issues and amends the PMS to remove or mitigate the potential for future reliability issues.

The PMS will also provide detailed record-keeping for improving organisation of maintenance activities, workload planning and on-the-job training of shipboard personnel.

#### 4.2.2. Planned Maintenance System Process

Planned maintenance activities are an essential part of ensuring vessel safe operation, reliability availability. Its effective use assures that the vessels are operating in optimal condition and with lowest operational risk.

The flowchart and description provided in Figure 1 below illustrates the methodology that Serco will use in our PMS to ensure its effectiveness. This will be documented within our overall Vessel Management System, as approved by the MCA.

---

Redacted

*Figure 1: Planned Maintenance System Flowchart*

---

This flowchart sets out the overall structured use of the PMS, how activities are driven from it and how unplanned activities are included into it.

Planned maintenance jobs will be undertaken within a specific timeframe, as set out in the PMS scheduling system. Redacted

### 4.2.3. Unplanned Maintenance process

Unplanned activities are maintenance tasks that are not scheduled by the PMS. By definition, these are unexpected maintenance activities that need addressing, such as machinery or equipment not performing to its expected performance standard.

In the event of equipment malfunction or failure to operate in the expected manner, it will be recorded in the PMS and appropriate remedial action taken to rectify the fault. Defects will be rectified in a manner that is safe and sympathetic to the environment and in accordance with any statutory instruments or company procedural requirements. Attached to each PMS record is an audit trail of relevant documentation, including but not limited to; condition or inspection sheets and email correspondence.

Redacted

### 4.2.4. Maintaining vessel critical systems

The Classification Society defines the critical systems and equipment, and the minimum spares level, for each vessel's safe operation and reliability. These are inspected, monitored and maintained to ensure optimal efficiency.

Redacted

The level of spares will be reviewed periodically with priority on the replenishment of critical spares. The tables in section 4.9 of this plan details the critical spares for the fleet that underpin continuous operation.

### 4.2.5. Failure Modes and Effects Analysis of Critical Systems

Serco will continue to use a Failure Modes and Effect Analysis (FMEA) – a structured process of determining root causes of system fragility – in maintaining critical systems and machinery. This will be undertaken to enhance the current PMS at NorthLink and to give greater assurance that all systems critical to the provision of the service are maintained correctly and the level of spare parts maintained on board minimises downtime risk. This process assists in the identification of single point failures and enables measures for mitigation to be defined and implemented.

FMEA requires a PMS system capable of recording performance data over a long period, as system weak points may only be identifiable over time. Redacted

FMEA identifies machinery and equipment vulnerabilities, enabling preventative and proactive maintenance planning to be scheduled into the PMS, including evaluation of upgraded or enhanced parts. Serco will work with equipment suppliers to feedback findings to improve the overall long-term reliability of the fleet, providing an opportunity to expand on current DNV FMEA requirements.

### 4.3. Organisational capability and technical competence

#### 4.3.1. Technical vessel management

Redacted

Our maintenance schedule ensures maintenance is implemented in a diligent and cost-effective safe manner.

Redacted

Redacted

The Operational management organisational structure is shown in the following Figure 2.

Redacted

---

*Figure 2: Technical vessel maintenance*

---

### 4.3.2. Vessel organisation

Redactes

Redacted  
Redacted

---

*Figure 3: Crew structure for MV Hildasay and MV Helliar*

---

---

Redacted

*Figure 4: Crew structure for MV Hamnavoe*

---



---

Redacted

*Figure 5: Crew structure for MV Hrossey and MV Hjalmland*

---

#### 4.4. Supply Chain

In developing our maintenance plans we have carefully considered the range of suppliers needed for routine maintenance and dry docking, and we have sought to use as many local suppliers as possible. In doing this we can robustly control the forecasting and budgeting throughout the life of the contract. We will continue to use the existing supplier base and will enter into Service Level Agreements to cover the new contract. The purpose is to enable us to react quickly in the event of unplanned maintenance or repair demands.

Redacted

##### 4.4.1. Fuel and Lubricating Oils

Supply agreements are in place for fuel and lubricating oil from Redacted Serco has

achieved savings with our current suppliers which will continue in the new contract. We will enter into hedging arrangements as instructed to do so by TS.

As referred to in Schedule 12 and Section C, Clause 14.3 of the Draft Agreement, we will submit to the Scottish Ministers a Fuel Management Programme, not less than 30 business days before the Commencement Date.

Fuel and lubricating oils will be loaded via road tanker onto the vessels; these operations are carried out in Aberdeen and Stromness. In the latter case the road tanker will transit with the vessel to Stromness before bunkering takes place. In each case the tanker is driven onto the vehicle deck, and strict bunkering procedures are adhered to and appropriate oil spill response equipment will be mobilised. This has the benefit that in the unlikely event of a spillage during the bunkering operation any spill will be contained on the vessel.

##### 4.4.1.1. Fuel Consumption

*Fuel Consumption comparison at start of contract in 2012 and at end in 2018*

Fuel usage is a major cost factor in the operation of a fleet of vessels. The maintenance programme is essential to ensure that fuel is used efficiently. The comparison given below, in Table 3, of energy consumption in 2018 as compared to 2012 shows how the process of maintaining and evolving the vessel and the methodology of maintenance have assisted in reducing overall energy consumption. Serco are committed to continuing this process and keeping abreast of developments that can assist in maintaining an efficiently operated vessel.

Redacted

#### 4.5. Appropriate investment

Short-term cost savings in vessel maintenance can result in problems that are challenging and expensive to rectify. Also, inadequate maintenance can potentially reduce service resilience and increase the risk of service disruption because of breakdown or technical failures. Redacted

Redacted

Each vessel's anticipated maintenance budget will be properly costed, and we will monitor year-on-year spending on vessel maintenance to determine the ongoing budget. Variation and the drivers of unexpected additional maintenance activity will be reflected in future budget setting.

As the fleet ages we anticipate investment in maintenance will increase and we will plan accordingly. Our PMS, supplemented with OEM data on lifecycle expectations of major machinery and equipment, will enable us to budget for major replacements, more comprehensive work necessary at dry dock and review our stockholding of strategic spares, especially for components with long replacement lead times.

#### 4.6. Dry Docking of Fleet Vessels

This section outlines our arrangements for dry docking the NorthLink fleet.

##### 4.6.1. Statutory compliance

The Flag State Authority, MCA, and the Classification Society DNV-GL defines a structure for compliance with safety standards and hull and machinery maintenance respectively. These bodies conduct inspections to determine that the standards are maintained. Serco will work with both bodies to ensure compliance with their requirements as a minimum and will, where deemed appropriate, exceed these statutory requirements.

We will comply with International Maritime Organization (IMO), 1988 SOLAS Protocol adopted by the International Conference on the Harmonized System of Survey and Certification. Annual surveys are held on the anniversary of the first Annual Classification Survey as described in SOLAS chapter 1.

The survey requirements include checking the validity of relevant certificates, which must be retained on board:

- Last special survey certificates for hull and certificate of class for machinery
- Latest issued interim certificate for hull and machinery
- Statutory certificates:
  - Safety construction
  - Safety equipment
  - Safety radio
  - Load line
  - International Oil Pollution Prevention (IOPP)
  - Ship sanitation certificate
  - Passenger certificate

Under the terms of the regulations, it is an offence for any vessel, to which these regulations apply, to proceed or attempt to proceed to sea without the requirements of the regulations being complied with. Serco will comply with the above requirements for all vessels in the NorthLink fleet.

#### 4.6.2. Dry Docking arrangements

Dry docking is a routine part of maintaining and operating a fleet of vessels. This provides the opportunity to undertake maintenance on the thrusters, propellers and stern seal as well as vessel anti-roll stabilisers. It provides access to the underwater sections of the vessel, including train shaft, propellers, stabilisers, sea chests and bow thrusters, rudders and other parts that are immersed in water and are normally inaccessible during normal sailing periods. Inspection and cleaning of hull coating determines its effectiveness in reducing drag, which has a significant effect on the service speed and fuel efficiency, as well as effectively preventing hull wastage – rust or corrosion. An example of our application of paint coatings to reduce energy consumption is shown in the case study below.

##### Case Study Intersleek underwater paint coatings of RoPax vessels to improve efficiency

We applied Intersleek underwater paint coating to the RoPax vessels under CMAL ownership in 2012 and again in 2019. As part of continuous vessel maintenance, we applied paint to the propellers, and through inspection and cleaning have maintained improved efficiency between dry dockings as described in 4.4.1.1. This process has assisted in reducing the energy consumption of the vessels.



- Serco has approached the dry docking of vessels with the objective of minimising the impact of disruption on the service by reducing the time off service. Our approach was to seek a better overall solution that met our quality requirements, supported work in Scotland and would reduce sailing times to and from dock Redacted We are still in negotiations with other sub-contracted dry docking companies to agree further efficiencies. These negotiations will be included in the mobilisation period of the new contract.

Redacted

Because of the age and type of the vessels (Passenger) currently in the fleet, dry dockings are currently undertaken annually. If appropriate, in-water inspections will be undertaken to ensure that no anomalies exist that could impact on the future viability of the vessels' capability to deliver a reliable service.

We will agree the dry docking programme with TS in advance, ensuring it reflects feedback from key stakeholders. This is particularly important to freight customers who depend on continuity of service and advanced notice of service availability, enabling them to work with their own customer supply chains in planning for reduced services. The process for dry docking is shown in Figure 6.

---

Redacted

*Figure 6: Decision tree for dry docking*

---

### 4.6.3. Dry docking programme

All merchant vessels over 500grt require a complete inspection of hull in a dry dock twice within a five-year period, based on the Class renewal anniversary date as stated in the Certificate of Class (special survey) and within 2.5 years (intermediate survey). The intermediate survey must be undertaken within 36 months of the special survey date.

A dry docking programme has been created for the vessels. This follows a routine pattern of 1, 2.5, and 5-year docking surveys. Table 5 shows the programme for the eight years of the Contract.

Redacted

The flow diagram, Figure 7, below illustrates the process for developing a drydock specification, from initiation to returning the vessel back into service.



---

*Figure 7: Flow diagram showing the process for developing a dry dock specification*

---

Applying the above process ensures we retain control of the scope of work and engage with the dry docking company and subcontractors to meet the budgeted forecast. This forward planning minimises emergent work and cost overruns. Redacted

#### 4.6.4. Fleet Relief for Planned Dry Dock and Unplanned Maintenance

Serco will provide fleet relief for the duration of the contract, ensuring scheduled maintenance, dry dockings and unforeseen breakdowns will be effectively managed to ensure continuity of our efficient ferry service from one contract to another. We will follow the instructions of Transport Scotland where they have sourced alternative fleet relief. Table 4 shows the potential capability for fleet relief within the current vessels. This is dependent on availability and will be supplemented with externally resourced vessels where necessary.

---

Redacted

---

Assessing the market availability of vessels with suitable specifications to meet the requirements of a relief asset, we have identified the following potential vessels:

Redacted

Redacted

Redacted

Redacted

---

*Figure 8: Proposed new passenger accommodation – Hrossey*

---

---

Redacted

*Figure 9: Proposed new passenger accommodation – Hjalmland*

---

## 4.7.2. RoRo

### 4.7.2.1. Bow Thrusters

Redacted

### 4.7.2.2. Stabilisers

Redacted

## 4.7.3. Environmental considerations

Redacted

#### 4.7.4. Future Vessel Considerations

Every vessel has a finite life and as responsible operators Serco recognise that the operating criteria of vessels will change over time. The need to change vessel capacity, either by altering the current vessels or by constructing new tonnage will be examined in conjunction with TS and CMAL. The port facilities available will also have a major bearing on the size and type of vessel which may be suitable. As such the vessels maintainability and operability will need to be considered in the future to take into account the following:

- The construction of the new port area at Aberdeen, south of the current harbour facility and the future availability of this facility. It is understood that there is no planned availability for this facility; to support a permanent ferry terminal, however, this would have to be confirmed at the time of any change of vessel capability.
- The possible future demands on the routes for local residents and freight requirements
- The possible future demands for peak and off-peak demand due to the tourist demand

These considerations will need to be explored during the period of the next Contract award, to ensure that at the end of the contract period suitable plans are in place, and that suitable provision for the future of the services can be actioned.

The plans should examine the possibility of life extension on the current RoPax vessels or the construction of new vessels. Either option will need to take into consideration the future needs of the communities which they serve and the ability of the option chosen to deliver that service for the design period.

##### 4.7.4.1. Alternative Fuelling Arrangements

Redacted

#### 4.8. Proposals for Vessel Maintenance

Table 7: Proposals for Vessel Maintenance

Proposals	Timing and duration	Responsibility	Stakeholders involved	Assumptions/dependencies	Method for measuring results
Drydocking	Redacted				
..... Drydocking ..... PMS task completion and system updates ..... Maintenance of Ship Energy Efficient Management Plan (SEEMP) ..... Monitoring of fuel consumption to minimise operating cost and emissions					



#### 4.9. Vessel Critical Systems

Table 8: Vessel Critical Systems

Hamnavoe Critical Systems	Associated Equipment	In continuous use?	Standby and Backup arrangements	Measures to promote reliability	Other comments
Bilge System	Redacted				
Control Air System					
Emergency Electrical Stops					
Emergency Generator					
Emergency Switchboard					
Fire Detection System					

Hamnavoe  
Critical Systems

Associated Equipment

In continuous use?

Standby and Backup  
arrangements

Measures to promote  
reliability

Other comments

---

Bilge System	Redacted				
Control Air System					
Emergency Electrical Stops					
Emergency Generator					
Emergency Switchboard					
Fire Detection System					

---

Hrossey and  
Hjaltland  
Critical System

Associated Equipment

In  
continuous  
use?

Standby and Backup arrangements

Measures to promote  
reliability

Other comments

---

Bilge System

Redacted

---

Control Air System

---

Emergency  
Electrical Stops

---

Emergency  
Generator

---

Emergency  
Switchboard

---

Fire Detection  
System

---

Main & Auxiliary  
Engine Cooling  
Systems & Controls

---

Main Switchboard

---

Hrossey and  
Hjaltland  
Critical System

Associated Equipment

In  
continuous  
use?

Standby and Backup arrangements

Measures to promote  
reliability

Other comments

---

Public Address  
System

Redacted

---

Quick Closing  
Valves

---

UPS Systems

---

Helliar and Hildasay  
Critical System

Associated Equipment

In  
continuous  
use?

Standby and Backup arrangements

Measures to promote  
reliability

Other comments

---

Steering Gear

Redacted

---

Emergency Fire  
Pump

---

Navigation  
Equipment

---

Communication  
Equipment

---

Helliar and Hildasay  
Critical System

Associated Equipment

In  
continuous  
use?

Standby and Backup arrangements

Measures to promote  
reliability

Other comments

---

Lifeboat

Redacted

---

Emergency  
Generator

---

Fire Detection  
Equipment

---

Fixed firefighting  
system (CO2)

---

Drencher System

---

Quick Closing  
Valves

---

Emergency Pitch  
Control

---

## 5. Monitoring and review

Serco, as a responsible ship management company, undertakes an effective process of annual vessel inspections. Redacted

The survey and certification regulations state that owner and master of every vessel must maintain the condition of the vessel and its equipment to conform with the provisions of the regulations. This will ensure that our vessels remain fit to proceed to sea without danger to the vessel integrity or people on board. CMAL will undertake vessel inspections as part of their annual process of due diligence. Alongside the audit process, it will continue to ensure that vessels are being operated and maintained in accordance with legislative and company requirements and industry practice.

Redacted

### 5.1. Use and retention of Records of Inspection (ROI)

Maintaining a record of the inspections conducted provides a valuable historical record of a vessel's performance. This record provides information that can be used to assess the past performance of a vessel and provides indicators where the vessel performance is below the standard expected over a period of time. Serco will use this information as part of a continuous improvement programme to identify areas of improvement and to refine the maintenance system where this is appropriate.

On conclusion of every vessel inspection a Record of Inspection (ROI) is completed. If no notable deficiency is identified, then the record of inspection is completed with a relevant comment or observation. This remains onboard the vessel for future reference and as documentary evidence that the inspection has taken place. The ROI is completed by allocating each deficiency with a sequential number and an action code. Action codes are consistent with those used by the administration and the Paris Memorandum of Understanding on Port State Control, which prevents confusion. A list of the action codes is contained on the reverse of the ROI.

In accordance with all ROIs or Non-conformance Notices (NCN) issued to the vessel, any ROI following an inspection remains under the ownership of the Master. If the items raised states the need for shore-side action, the deficiency still remains under the control of the Master and is only closed-out by the Master onboard the vessel. Once the deficiency has been satisfactorily addressed, the date of satisfactory completion is to be annotated on the ROI and the date on which the lead inspector was advised of close-out. An electronic copy of the completed ROI is forwarded to the lead inspector for close-out of the inspection process. The ROI will be stored in accordance with Company requirements.

### 5.2. Serious Deficiencies

Serious deficiencies have the potential to disrupt the provision of service. It is necessary to have a system in place that can identify these deficiencies at the earliest opportunity. Serco will use the planned maintenance system as a vehicle to monitor systems and identify potential deficiencies that could disrupt the service. The methodology we will use is outlined below.

A serious deficiency is defined as one that breaches a regulation or convention requirement or has caused a disruption to scheduled service or has the potential to do so. Where a deficiency has been noted, an action code is allocated to that deficiency. Redacted

This type of 'self-regulation' is regarded highly by the authorities, showing the will of the company to ensure that rules and regulations are followed, regardless of the financial or commercial pressure, which is an important and underpinning aspect of the International Safety Management (ISM) code. If a vessel is held through an internal 'preventative detention', the Management Inspector must ensure that all reasons for its issue are duly noted. The vessel will be released when it is determined that there is no compromise to its safety, integrity and personnel.

Some equipment failures (e.g. navigation equipment, LSA or Marpol Annex I pollution prevention equipment) are granted a temporary exemption by the Administration only on condition that a satisfactory assessment of the risk has been undertaken by the company and that suitable and sufficient mitigation is set in place for the period that the dispensation has been requested. Figure 10 illustrates the non-compliance flowchart that Serco will utilise as part of the Non-conformance recognition methodology.

---

Redacted

*Figure 10: Non-compliance flowchart*

---

### 5.3. Risks and Mitigation

Risk is a part of any operation. In certain areas the risk requires more careful control, dependent on the severity of the harm that can be done. Part of the risk reduction strategy is to ensure that the risks that could potentially seriously impact the service are identified and suitable mitigation measures are put in place to control or eliminate them. Serco is committed to continuing to monitor the hazards present and evaluating the risk they present. Where the hazard identified has a high probability of causing disruption, we will take action to put suitable barriers in place to control that risk.

Table 9: Risk and mitigations

Risk area	Risk description	Redacted
Vessel maintenance	Vessel breakdown	
Vessel maintenance	OEM requirements change requiring updating of the PMS	
Vessel maintenance	Arising and latent defects	
Vessel Operation / Maintenance	Vessel breakdown could have an impact on reliability and performance	
Vessel Operation	Change of crew and staff could cause resentment	
Vessel Operation	There is a dependency on Harbour Authorities to provide safe ports and facilities	
Vessel Operation	There could be health, safety and environment issues as a result of inconsistently applied procedures and standards	
Vessel Operation	Cost of upgrades may not result in the returns predicted in any cost benefit analysis	



## Appendix A1 V3-1: Vessel Details

Serco will continue to use the vessels used in the current contract to ensure continuation of service at its current level. These vessels are well suited to the facilities available at the ports and we will continue to ensure effective interaction with local services. The following tables outline the details of the CMAL vessels that we will use to deliver the service:

MV Hrossey	
Owner	CMAL
Operator	NorthLink
Flag / Port of Registry	UK / Kirkwall
Class	100 A 1, RoRo Cargo / Passenger Ferry + LMC, UMS, LI, NAV1 Lloyds
Type	RoRo/ Passenger Vessel
Built	Aker Finnyards 2002
IMO	9244960
MMSI	235448000
Call-Sign	VSTY6
Passenger Certificate	Yes
Gross Tonnage	11,230
DWT	1,563
Main Engines	4 x 5,400 kW (MaK6M43),500 rpm, total 21,600 kW
Number & type of propellers	2x KaMeWa 4.1m controllable pitch propellers
Rudder(s) including type	2
Bow Thruster(s)	2
Stern Thruster(s)	0
Speed	24 kts
Length (m)	125
Beam (m)	19.5
Draft (m)	5.3
Doors	2
Capacity	600 passengers, 125 cars

## MV Hjalmland

---

Owner	CMAL
Operator	NorthLink
Flag / Port of Registry	UK / Kirkwall
Class	100 A 1, Ro-Ro cargo / passenger ferry + LMC, UMS, LI, NAV1 Lloyds
Type	RoRo / Passenger Vessel
Built	Aker Finnyards 2002
IMO	9244958
MMSI	235450000
Call-Sign	VSTY8
Passenger Certificate	Yes
Gross Tonnage	11,230
DWT	1,563
Main Engines	4 x 5,400 kW (MaK6M43),500 rpm, total 21,600 kW
Number & type of propellers	2x KaMeWa 4.1m controllable pitch propellers
Rudder(s) including type	2
Bow Thruster(s)	2
Stern Thruster(s)	0
Speed	24 kts
Length (m)	125
Beam (m)	19.5
Draft (m)	5.3
Doors	2
Capacity	600 passengers, 125 cars

---

## MV Hamnavoe

---

Owner	CMAL
Operator	NorthLink
Flag / Port of Registry	UK / Kirkwall
Class	100 A 1, RoRo Cargo / Passenger Ferry + LMC, UMS, LI, NAV1**Lloyds
Type	RoRo / Passenger vessels
Built	Aker Finnyards 2002
IMO	9246061
MMSI	235449000
Call-Sign	VSTY7
Passenger Certificate	Yes
Gross Tonnage	8,780
DWT	1,200
Main Engines	2 X Mak 9M32C
Number & type of propellers	2 CPP
Rudder(s) including type	2
Bow Thruster(s)	2 X TT 1650CP 1
Stern Thruster(s)	0
Speed	19 kts
Length (m)	112m
Beam (m)	8.5m
Draft (m)	4.4m
Doors	2 bow and stern
Capacity	600 passengers, 95 cars

---

**MV Hildasay**

---

<b>Owner</b>	CMAL
<b>Operator</b>	NorthLink
<b>Flag / Port of Registry</b>	IoM Douglas
<b>Class</b>	DNV-GL ✕ 1A1 General cargo carrier RoRo Container Ice (1A)
<b>Type</b>	320 – Roll-on, roll-off carrier
<b>Built</b>	1996
<b>IMO</b>	9119426
<b>MMSI</b>	235087121
<b>Call-Sign</b>	2EPP6
<b>Passenger Certificate</b>	Cargo Max 12 passengers
<b>Gross Tonnage</b>	7606
<b>DWT</b>	5708
<b>Main Engines</b>	2 X Wartsila 9R32LN
<b>Number &amp; type of propellers</b>	2 CPP Wartsila PR100 / 4I
<b>Rudder(s) including type</b>	2
<b>Bow Thruster(s)</b>	1 X Ulstein 150TV
<b>Stern Thruster(s)</b>	0
<b>Speed</b>	17.2 kts
<b>Length (m)</b>	122.32
<b>Beam (m)</b>	19.8
<b>Draft (m)</b>	5.1
<b>Doors</b>	1 stern door
<b>Capacity</b>	12 passengers, 88 trailers

---

**MV Helliar**

---

Owner	CMAL
Operator	NorthLink
Flag / Port of Registry	IoM Douglas
Class	DNV-GL ⚡ 1A1 General cargo carrier RO/RO Container Ice (1A)
Type	320 – Roll-on / roll-off carrier
Built	1997
Official No	09733
IMO	9119317
MMSI	235087119
Call-Sign	2EPPS
Passenger Certificate	Cargo Max 12 passengers
Gross Tonnage	7,606
DWT	5,758
Main Engines	2 X Wärtsilä 9R32LN
Number & type of propellers	2 CPP Wärtsilä PR100/4I
Rudder(s) including type	2
Bow Thruster(s)	1 X Ulstein 150TV
Stern Thruster(s)	0
Speed	17.2 kts
Length (m)	122.32
Beam (m)	19.8
Draft (m)	5.1
Doors	1 stern door
Capacity	12 passengers, 88 trailers

---