

Project Title	Seagreen Wind Energy Ltd
Document Reference Number	LF000009-CST-OF-PRG-0004

# Operations and Maintenance Programme (Offshore Transmission Assets)

OTA Marine Licence MS-00010467, Condition 3.2.3.2

For approval of the Scottish Ministers

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### **Purpose of the Programme**

This Operations and Maintenance Programme (Offshore Transmission Assets) (OTA OMP) is submitted to address the specific requirements of the relevant conditions attached to the Marine Licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 on 10 October 2014, as amended by the Marine Licences granted by the Scottish Ministers on 6 March 2019 (reference 04678/19/0), 10 October 2022 (reference MS-00010078) and 29 November 2023 (reference MS-00010467) in respect of the Seagreen Offshore Transmission Assets (OTA) associated with the Seagreen Alpha and Seagreen Bravo Wind Farms (OWFs) (the 'OTA Marine Licence').

Seagreen Alpha and Seagreen Bravo associated OTA is referred to as the 'Seagreen Project'.

The overall aims and objectives of the OTA OMP are to set out the procedures and good working practices for the operation and maintenance (O&M) of the Seagreen OTA infrastructure. A separate OMP (LF000009-CST-OF-PRG-0001) has been prepared for the O&M of the Seagreen OWFs.

The OTA OMP demonstrates that operations and maintenance procedures to be employed align with those set out within the Environmental Statement (ES) and ES Addendum.

All Contractors (including their Sub-Contractors) involved in the operation and maintenance of the Seagreen OTA are required to comply with this OMP through conditions of contract.

Note that the OTA is subject to the OFTO process. At the point of transfer of the OTA (and the OTA Marine Licence) to the OFTO, the OFTO will be responsible for the operation and maintenance of the OTA, for compliance with the OTA Marine Licence and for compliance with and ongoing update of the OMP.

## Operations and Maintenance Programme Overview

### Structure of the Plan

The OTA OMP is structured as follows:

- |            |   |
|------------|---|
| Section 1  | Provides an overview of the consent requirements that underpin the content of this OTA OMP, identifies linkages with other consent plans and describes the process for making updates and amendments to the programme |
| Section 2  | Provides an overview of the OTA   |
| Section 3  | Describes the approach to safety, health and environmental management and the Environmental Management System (EMS)   |
| Section 4  | Describes and provides indicative timings for routine servicing and maintenance activities, and sets out potential unscheduled activities that are anticipated during the operational lifecycle of the assets         |
| Section 5  | Describes relevant environmental sensitivities to be considered when planning and O&M activities, and good working practices to be adopted  |
| Section 6  | Demonstrates compliance with the original application   |
| Section 7  | Lists applicable reference documents used to inform this OTA OMP  |
| Appendix A | Lists the abbreviations and defines terms used in the OTA OMP   |
| Appendix B | Sets out the OTA OMP Change Management Procedure  |
| Appendix C | Lists good practice guidance applicable to offshore wind operations and maintenance   |
| Appendix D | Summarises the O&M activities as proposed in the ES   |

### Scope of the Plan

This OTA OMP covers, in line with the requirements of the consent conditions, the following in relation to the Seagreen OTA:

- The management systems to be implemented during the O&M of the OTA;
- A description of the activities to be undertaken during the O&M phase
- The good working practices to be adopted for O&M of the OSPs, substructures and export cable network, and
- The environmental sensitivities which may affect the timing of the O&M activities

### Plan Audience

This OTA OMP will be submitted for approval to the Scottish Ministers in consultation with other stakeholders, in relation to monitoring compliance with the specific requirements of the relevant consent conditions.

Compliance with this OTA OMP will be monitored by Seagreen's Site Operations Manager and Environmental Advisor, Seagreen's appointed Contractors and the Marine Directorate Licensing and Operations Team (MD-LOT).

Copies of this OTA OMP are to be held in the following locations:

- Seagreen's head office;
- Seagreen's Marine Coordination Centre;
- at the premises of any Contractor acting on behalf of Seagreen in relation to O&M activities; and
- aboard any vessel engaged in the O&M of the OTA.

**Following transfer of the OTA and the OTA Marine Licence to the Offshore Transmission Owner (OFTO), it shall be the responsibility of the OFTO to comply with the OMP - and all other associated Consent Plans that apply to the OTA - in full**

## 1. Introduction

### 1.1 Consents and Licences

Seagreen Wind Energy Ltd (hereafter referred to as 'Seagreen') was awarded Section 36 Consents (under the Electricity Act 1989 by Scottish Ministers in October 2014 for Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (OWFs).

Marine Licences for Seagreen Alpha OWF, Seagreen Bravo OWF and the Offshore Transmission Asset (OTA) were also awarded by Scottish Ministers in October 2014 (subsequently varied) under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009. All consents and licenses have subsequently been varied on application by Seagreen.

On 12 December 2019, the Bravo Marine Licence was transferred from the name of Seagreen Bravo Wind Energy Limited (SBWEL) into the name of Seagreen Alpha Wind Energy Limited (SAWEL).

### 1.2 Project Description

The Seagreen Project is located in the North Sea, in the outer Firth of Forth and Firth of Tay region and comprises the OWFs (the wind turbine generators (WTGs), their foundations and associated array cabling connecting the WTGs to the Offshore Substation Platforms (OSPs)), together with associated infrastructure of the OTA (the OSPs, their foundations and the offshore export cables), to facilitate the export of renewable energy to the national electricity transmission grid. The location of the Seagreen Project is shown in Figure 1.1.

The Seagreen Project consists of the following key components:

- One OSP, installed on 12 pin pile foundations; and
- Three 200kV subsea export cables, totalling 189.2 km in length, to transmit electricity from the OSP to the landfall at Carnoustie and connecting to the onshore export cables for transmission to the onshore substation and connection to the National Grid network at Tealing, Angus

Export cables were buried where possible and where burial was not possible cable protection was installed.

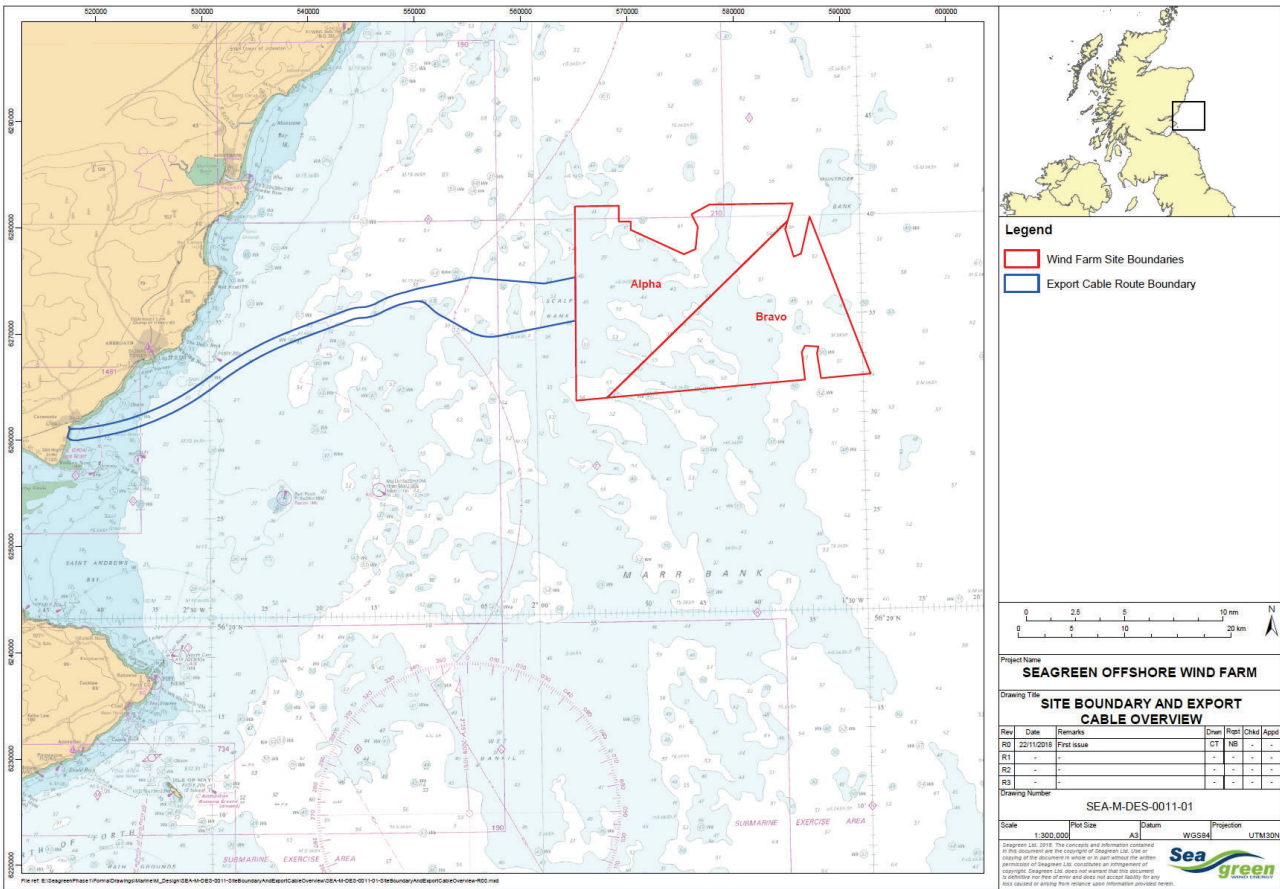


Figure 1.1 Seagreen Project Location

### 1.3 Consent and Licence Requirements

This OTA OMP has been prepared to discharge condition 3.2.3.2 of the OTA Marine Licence as set out in Table 1.1. Other conditions relevant to the OTA OMP are also listed.

Table 1.1 Consent conditions to be discharged by this Operation and Maintenance Programme

Consent document	Condition reference	Condition text	Reference to relevant section of this OMP
OTA Marine Licence (MS-00010467)	3.2.3.2	The Licensee must, no later than 3 months prior to the commissioning of the first OSP, submit an OMP, in writing, to the Licensing Authority for their written approval.	Rev02 of this OMP was submitted in advance of commissioning of the OTA and approved by the Scottish Ministers.
		Such approval may only be granted following consultation by the Licensing Authority with the MOD, the JNCC, SNH, SEPA, MCA, NLB, Angus Council and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation to be undertaken by the Marine Directorate on behalf of the Scottish Ministers.
		The OMP must set out the procedures and good working practices for the operations and maintenance of the OSPs, substructures, and cable network of the Works.	Good working practices set out in Section 5.2 with O&M procedures set out in Section 4.
		Environmental sensitivities which may affect the timing of the operation and maintenance activities must be considered in the OMP.	Set out in Section 5.1. <i>See also: LF000009-CST-OF-PLN-0001 Operations Environmental Management Plan.</i>
		The OMP must, so far as is reasonably practicable, be consistent with the EMP, the PEMP, the VMP, the NSP, the CaP and the LMP.	Set out in Section 1.4.
	Condition 3.2.4.9	The Licensee must operate and maintain the Works in accordance with the approved OMP.	This document sets out the OMP (for the Offshore Transmission Assets).
		Notification must be provided at least 3 months in advance of any maintenance of the Works where any additional deposits are required.	Set out in Section 4.
		In the event that these works are not assessed in the Application and are considered by the Licensing Authority as being material they will require further Marine Licences.	Set out in Section 4.

#### 1.4 Linkages with Other Consent Plans

This OTA OMP document sets out the intended programme of O&M activities in relation to the Offshore Transmission Assets (offshore substation platforms and their substructures, and export cables). A separate related OMP document sets out the intended programme of O&M activities in relation to the Offshore Transmission Assets (WTGs and substructures, and inter-array cables) (see document LF000009-CST-OF-PRG-0001).

Condition 3.2.3.2 of the OTA Marine Licence (see Table 1.1) requires this OTA OMP to be so far as it is reasonably practicable, consistent with a number of other specifically named Consent Plans as follows (in the order listed in the licence condition):

- Environmental Management Plan (EMP)
- Project Environmental Monitoring Programme (PEMP)
- Vessel Management Plan (VMP)
- Navigational Safety Plan (NSP)
- Offshore Transmission Assets Cable Plan (CaP)
- Lighting and Marking Plan (LMP)

Other Consent Plans required under the OTA Marine Licence are also relevant to the O&M activities. Table 1.2 summarises the linkages between this OMP and consent Plans that will endure following full commissioning.

Enduring Consent Plans are cross-referenced within this OMP as appropriate, however, the detail within these plans is not repeated within this OMP. Enduring Consent Plans have been updated in preparation for the O&M phase.

Table 1.2 Linkages between the OTA OMP and other Consent Plans

Consent Plan	Relevance to OTA OMP
Vessel Management Plan (OTA VMP)	The VMP provides details of ports and indicative vessel transit routes associated with the operation of the OTA and outlines relevant environmental sensitivities and mitigation associated with vessel movements.  Vessel activity associated with O&M activities and outlined within this OMP will be managed consistently with the procedures and mitigation presented in the VMP.
Navigational Safety Plan (OTA NSP)	<b>The NSP</b> sets out the navigational safety measures to be applied for the OTA including matters related to marine coordination, safety zones, routing, anchorages and notifications and communications for other sea users. The NSP will apply to all vessels involved in O&M activities.
Offshore Transmission Assets Cable Plan (OTA CaP)	<b>The CaP</b> sets out Seagreen's approach to monitoring for cable exposure. The O&M activities outlined within this OMP will be consistent with the procedures described in the CaP.

Consent Plan	Relevance to OTA OMP
Lighting and Marking Plan (OTA LMP)	<b>The LMP</b> provides details of aviation and navigational lighting and marking of the OTA during operation. The OMP will incorporate requirements for monitoring and mitigating any lighting failures associated with the lighting and marking strategy outlined in the LMP.
Traffic and Transportation Plan (OTA TTP)	<b>The TTP</b> confirms that no specific transport-related mitigations are necessary for the O&M phase
Fisheries Mitigation and Management Strategy (OTA FMMS)	<b>The FMMS</b> sets out the mitigation strategy relating to the commercial fishing industry in order to minimise or avoid effects on fishing.
Marine Pollution Contingency Plan (MPCP) LF000009-CST-OF-PLN-0012	Sets out the procedures to be followed in the event of a marine pollution incident or collision observed during O&M activities. The plan sets out statutory notification requirements and project-specific procedures to be followed in the event of an incident.
Project Environmental Monitoring Programme (PEMP) LF000009-CST-OF-PRG-0003	The PEMP provides an overview of the programme developed by Seagreen to monitor the environmental effects of the construction and operation of the OTA. The PEMP includes plans for benthic, scour, fish, bird and marine mammal monitoring. Where monitoring identifies any new information relating to environmental sensitivities, this may result in an update to the OMP, if required in accordance with the change management procedure set out in Appendix B.
Archaeology Written Scheme of Investigation (WSI) and Procedures for Archaeological Discoveries (PAD) LF000009-CST-OF-PLN-0002	The WSI sets out the mitigation procedures that must be followed in order to avoid damage to cultural heritage assets and targets of archaeological potential  The PAD sets out the protocols and procedures that must be followed in the event of any unexpected archaeological discoveries whilst undertaking O&M activities.
Decommissioning Programme (DP) LF000009-CST-MA-PRG-0003	Sets out the strategy for decommissioning the OTA at the end of the operational lifecycle.
Operational Environmental Management Plan (OEMP) LF000009-CST-OF-PLN-0001	Details the environmental management framework for the operation of the OTA. The O&M activities described in this OMP will be undertaken in line with the environmental management measures described in the OEMP. <i>Note the OEMP replaces the Construction EMP</i>

### 1.5 Document and Change Management Process

Should any updates to this OTA OMP become necessary, the change management process for any updates required to the OTA OMP including resubmission of Consent Plans for approval is outlined in Appendix B.



**Document Reference**

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## 2. Overview of Assets

### 2.1 Offshore Transmission Assets

The Offshore Transmission Assets that make up the Seagreen Project, and covered by this OTA OMP, consist of the following main components:

- One Offshore Substation Platform (OSP) on a jacket substructure installed on pin-piled foundations
- Three subsea 225kV export cables, totalling 189.2 km in length connecting the OSP to landfall at Carnoustie, Angus

The OSP location and export cable routes are shown on Figure 2.1. The final asset locations were confirmed upon full commissioning as required by condition 3.2.4.5 of the OTA Marine Licence.

Further details can be found in the OTA CaP.

### 2.2 O&M Base and Marine Co-ordination Centre

The Offshore Transmission Assets shall be managed out of the Seagreen O&M base in Montrose. The base houses technicians and management personnel whilst Montrose Harbour provides dedicated quayside facilities for loading and unloading of crew transfer vessels (CTVs) and waste handling. The O&M base includes office and welfare facilities, spare part storage space, and also houses the Seagreen Marine Co-ordination Centre (MCC).

The Seagreen MCC shall provide the following key services:

- Work permit activation/deactivation
- Marine surveillance - vessel and personnel tracking
- Emergency response coordination
- Monitoring of the Supervisory Control and Data Acquisition (SCADA) system and HV switching (including alarm handling)



### 2.3 Supervisory Control and Data Acquisition System (SCADA)

A SCADA system has been developed to provide an operator interface with the Offshore Transmission Assets. The SCADA system provides an interface to the OSP controllers and provides high-level performance and system information. The SCADA system will allow operatives to override automatic operation, adjust control parameters, and interrogate detailed operational and performance data.

The OTA SCADA system also provides remote monitoring and control of the MV/HV network allowing the complete network, or sections thereof, to be isolated or re-energised remotely. Data from the SCADA system and other monitoring devices will be integrated using a data historian to provide robust historical data to support proactive maintenance strategies and a performance-driven approach.

Day-to-day monitoring and control of the SCADA system will be the responsibility of the Control Room Operator based at the Seagreen Control Room and MCC. The SCADA system will be configured to notify operatives (via alarms) if system issues arise. It will also be possible to log in to the SCADA systems via a remote internet connection.

If any system issues arise then the Control Room Operator has the capacity to initiate shutdown of the OSPs if necessary. When intervention with the dedicated OSP controller is necessary, the operator will inform the Operations Manager, who will coordinate any remedial action as required.

### 2.4 Key Operation Programme Milestones

Table 2.1 sets out the key operation programme milestones for the OTA.

Table 2.1 Key operation programme milestones

Milestone	Anticipated Programme
OSP installed	March 2022
First WTG commissioned	March 2022
First power exported	August 2022
Export cables installation complete	November 2022
OSP – full commissioning	January 2023
Full commissioning of all WTGs (114) (full power)	October 2023

### **3. Approach to Safety, Health and the Environment**

#### **3.1 Introduction**

This and the following sub-sections are intended to summarise the key elements of the overarching Seagreen commitment to Safety, Health and Environment (SHE) management.

Seagreen is committed to undertaking the O&M of the OTA in a way that minimises the risks to SHE, insofar as reasonably practicable. For full details of Seagreen's overarching commitments relating to environmental management of the operation of the Seagreen Project, see Operational Environmental Management Plan (OEMP) (LF000009-CST-OF-PLN-0001).

Seagreen will require that all O&M activities have been risk assessed and that adequate control measures and actions are in place to manage the risk to as low as reasonably practicable (ALARP).

Seagreen is approaching the management of technical risk by adoption of a technical Health & Safety Management Plan in line with ALARP principles and will be producing an Operational Safety Case which will be applied to the lifecycle of the assets.

The application of the technical Health & Safety Management Plan to the O&M phase of the assets provides the necessary input to the Operational Safety Case. The Operational Safety Case provides an effective argument, with referenced substantiation, that assets are safe to operate and maintain in terms of the management of associated Significant Accident Hazard (SAH) risks to levels that are ALARP.

The overall objective of this procedure is to provide sufficient information and guidance on the process, activities, and documentation required to effectively and demonstrably manage the SAH risks associated with O&M to a level that is ALARP.

Seagreen will integrate the processes, activities, and documentation identified by the technical Health & Safety Management Plan, along with overarching company SHE policies, values and standards, via the Asset Management System (AMS).

#### **3.2 Asset Management System**

Seagreen will be implementing an overarching AMS. The AMS is a software solution specifically designed for managing physical assets through their life cycle.

The scope of the AMS shall cover the operational requirements associated with the O&M activities of the Wind Farm Assets and Transmission Assets (as described in Section 0) as well as the O&M base at Montrose.

The AMS shall include operational strategies which will govern Seagreen's approach to procurement and contract management, with the Seagreen SHE procedures required as standard through conditions of contract. The operational strategies will also govern the approach to work package management which covers such activities as the development of Risk Assessment Method Statements (RAMS) and the approach to Hazard Identification Risk Assessment (HIRA).

The AMS will include key O&M manuals, plans and procedures which will be implemented with support of the Health and Safety Management System and the Environmental Management System (EMS).

Records of all O&M activity (as described in section 4) shall be maintained for audit, monitoring and reporting purposes.

Further details on the emergency response during operations will be contained in a separate Emergency Response and Cooperation Plan (ERCoP) which will be developed in consultation with the Maritime and Coastguard Agency (MCA) and therefore does not form part of this OMP.

### **3.3 Environmental Management System**

In order to manage the environmental risks arising from the O&M of the OTA, an EMS shall be implemented.

The EMS includes processes designed to manage environmental impacts and secure environmental compliance and long-term sustainability. The EMS shall align with both the company Environmental Policy and the overarching AMS but shall also reflect the specific requirements of the consent conditions, environmental constraints, risks and opportunities specific to the OTA.

Full details of Seagreen's approach to the mitigation of site-specific environmental risks, consent and licence compliance and the management of contractor activity is set out in the Operational Environmental Management Plan (OEMP) (LF000009-CST-OF-PLN-0001).

This OMP, the OEMP, and the enduring Consent Plans (as summarised in Table 1.2) will form part of the suite of EMS documentation.

## 4. Operation and Maintenance Activities

### 4.1 Maintenance Requirements

To ensure the OTA operate safely and in an optimised state they are subjected to a number of routine maintenance activities that are carried out on a regular basis based on Original Equipment Manufacturer (OEM) recommendations and good industry practice. In addition, there are occasions when the OTA may require unscheduled visits to carry out repairs or other remedial works to return the assets to a serviceable condition.

If any maintenance works described in this section involve additional deposits<sup>1</sup> or other marine licensable activities (including any construction, alteration or improvement works), Seagreen will approach MD-LOT as far in advance of the proposed works as possible, to discuss the work plans and potential requirements for Marine Licences under the Marine (Scotland) Act 2010 and/or the Marine and Coastal Access Act 2009.

All records relating to the location and frequency of marine growth removal activities will be kept. For full details of Seagreen's overarching commitments relating to marine growth removal see, OEMP (LF000009-CST-OF-PLN-0001).

### 4.2 Routine Service Activities

All Offshore Transmission Assets are handed over to O&M with routine service recommendations and information detailing the level of servicing required. This information is used to plan and programme routine O&M activities, at appropriate frequencies.

#### 4.2.1 OSP Jackets

The specific O&M requirements and methods for the jacket foundation are provided in the O&M Manuals issued by the jacket designers.

The proposed routine inspection and maintenance activities and their indicative frequencies are listed in Table 4.1.

Remedial repairs will be made where defects are identified by visual inspection and servicing activities listed in Table 4.1.

In addition, the seabed around the pin-piled jacket foundation will be monitored for scour development, in accordance with engineering requirements. A post-installation survey will be conducted, and the findings used to understand the morphological and bathymetric conditions, magnitude and extent of any scour that occurs, the requirements for and timing of any future monitoring and the need for any rectification measures.

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<sup>1</sup> See condition 3.2.4.9 of the OTA Marine Licence

Table 4.1 Routine inspection and maintenance activities – OSP jacket foundation (indicative and subject to confirmation before final commissioning)

Component	Activity	Indicative frequency
Painted areas of jacket (all 'above water' areas)	Visual inspection	Annual
	Cleaning (removal of marine growth and guano)	As required
Boat landing areas (including ladder and buffer tubes) – subject to marine growth and paint damage	Visual inspection <sup>2</sup>	Prior to every CTV transfer
	Cleaning (jet wash)	As required
Ladders and working/access platforms	Cleaning (removal of marine growth and guano)	As required
Safety retracting lines (providing personal protection from falls from ladders)	Visual inspection <sup>2</sup>	Prior to every use
	Service and re-certification	Annual
Davit crane (for transfer of materials from CTVs and for emergency evacuation of personnel)	Visual inspection <sup>2</sup>	Prior to every use
	Service and re-certification <sup>3</sup>	Annual
Operational lighting (for general illumination of the structure for safe access and egress)	Service	Annual
Aids to Navigation (lighting, ID marker boards)	Service	Annual
Corrosion protection (CP) systems	Effectiveness checks	Every 5 years
Earth bonding	Integrity checks	Annual
Subsea sections of jacket structure	Visual inspection (by ROV)	Every 2 years
Welds	Inspection (sample)	Every 5 years (unless visual inspection indicates a defect)

#### 4.2.2 OSP Topsides

The proposed routine inspection and maintenance activities and their indicative frequencies are listed in Table 4.2.

Remedial repairs will be made where defects are identified by visual inspection and servicing activities listed in Table 4.2.

<sup>2</sup> Undertaken during routine maintenance/service visits to the OSP, not as a standalone task

<sup>3</sup> A Written Scheme of Examination will be put in place to extend the 6-month inspection of the emergency man riding point on the crane

Table 4.2 Routine inspection and maintenance activities – OSP topsides (indicative and subject to confirmation before final commissioning)

Component	Activity	Indicative frequency
HV gas insulated switchgear container	Visual inspection	6 monthly
MV gas insulated switchgear container	Visual inspection	6 monthly
Control container	Visual inspection	6 monthly
Transformer and sump	Visual inspection	6 monthly
Oil in water detector	Service	6 monthly
Radio mast	Visual inspection	6 monthly
Stairs, ladders and working/access platforms	Cleaning (removal of marine growth and guano)	As required

#### 4.2.3 Export Cables

Approximately one year following cable installation, an ROV survey will be undertaken to ensure that the cables remain as installed and to identify areas of cable at potential risk of exposure in the future. This survey will assess cable depth of burial and cable movement and identify any areas of free spanning cable. Monitoring will focus on any ‘at risk’ areas identified. Subject to the findings of the surveys, the frequency of ongoing monitoring will be adapted to the appropriate level of exposure risk.

All export cables are fitted with a thermal monitoring system that features depth of burial monitoring in near real time which will raise alarms in the control room should any variation in burial be detected. The intention is that once this system is commissioned any physical survey would be by exception to areas identified as seeing a change in burial depth and not on a specific periodic time basis.

In addition, the condition of the cable protection system will be assessed at a frequency to be determined following installation, based on the risk of damage and/or failure.

Further detail on cable exposure monitoring is set out in the OTA CaP.

#### 4.2.4 Landfall (below MHWS)

Annual visual inspections of the landfall area shall be conducted at a low spring tide to establish if any of the cable ducts have become exposed or damaged and to assess the condition of the reinstated revetment. Any necessary remedial actions will be discussed with Angus Council and MD-LOT.

### 4.3 Unscheduled Maintenance Activities

There will be occasions when the OTA will require unscheduled inspections, maintenance and/or repairs. These are typically undertaken where defects are identified during the routine activities listed in Tables 4.1

and 4.2 above. Unscheduled activities will be prioritised based on risk. For example, repairs to aids to navigation will be treated as a high priority to ensure the safety of other marine users and maintain the required operational availability. Similarly, personal safety equipment shall be treated as a high priority task. All unscheduled activity will be undertaken when weather and sea state conditions allow for a safe working environment.

Foreseeable unscheduled activities are summarised in Table 4.3 below. This table is not exhaustive, and all other works required to ensure integrity of the assets and their safe and efficient operation will be carried out as necessary.

Further details on cable exposure monitoring, reburial and cable failure are set out in the OTA CaP.

Specialist contractors shall be appointed to undertake unscheduled maintenance of the OSP jacket, jacket-mounted equipment and export cables.

Table 4.3 Indicative unscheduled maintenance activities

Jackets	Topsides	Cables (Export and Interconnector)
<ul style="list-style-type: none"> <li>• Repair/replacement of safety retracting lines and other personal safety equipment</li> <li>• Repairs to davit crane</li> <li>• Repairs to lighting (operational and navigational)</li> <li>• Repairs to navigation aids (marker boards and foghorns)</li> <li>• Paint repairs</li> <li>• ROV surveys of subsea jacket sections</li> <li>• Removal of marine growth</li> </ul>	<ul style="list-style-type: none"> <li>• MV/HV switchgear operations</li> <li>• Repairs to radio mast equipment</li> <li>• Repairs to SCADA, communications and battery equipment</li> <li>• Repairs to working platforms, handrails, lighting etc</li> <li>• Paint repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Remedial work to address exposed lengths of cable - reburial or rock placement</li> <li>• ROV surveys following a cable fault or possible damage (e.g. dragged anchor over cable trench)</li> </ul>

#### 4.4 Major Component Repairs

Major component repairs may result from unforeseen faults that could trigger emergency repairs requiring large component replacements and extensive remedial works.

For major maintenance works such as major component exchanges, Seagreen will approach MD-LOT as far in advance of the proposed works as possible, to discuss the work plans and potential associated Marine Licence requirements.

In relation to the OSPs, major component repairs could involve replacement of the entire topside, major topside components (containers/modules) or repairs to the jacket substructures. Such events would require mobilisation of specialist vessels. Timescales for repair works would largely be driven by the availability of replacement parts, specialist personnel, equipment and vessels.

In relation to the export cables, major component repairs may involve the removal and/or replacement of cables. Where ROV surveys identify a fault on a cable, damaged sections may be replaced by cutting and removing the defective section and jointing in a replacement length of cable. Such activities would be performed by specialist cable vessels. Cable re-trenching and/or installation of protection would likely be required.

All major component repair and replacement works would be planned and notified in advance to marine stakeholders who may be affected by the works (including, but not limited to, local mariners, fisheries organisations, harbour authorities and HM Coastguard) via Notices to Mariners issued by the Seagreen MCC.

## 5. Environmental Sensitivities and Good Working Practices

### 5.1 Environmental Sensitivities

Environmental sensitivities within the wind farm lease area have been identified during baseline surveys and desk-based reviews to support the Environmental Statement (ES) and Supplementary Environmental Information Statement (SEIS) supported by additional survey work undertaken as part of the PEMP.

Potential impacts from routine O&M activities (as described in Section 4.2) are associated mainly with vessel movements and the presence of vessels within the wind farm lease area. Service and inspection works will predominately take place on the OSP structures with limited interaction with marine species and habitats. No periods of increased environmental sensitivity were identified in the ES and SEIS relevant to vessel disturbance from O&M activities and no significant effects were predicted.

Unscheduled activities and, in particular, some major component replacements and repairs will have a greater interaction with environmental receptors. Table 5.1 outlines key environmental sensitivities considered in respect of the O&M activities set out in Section 4.

Table 5.1 Environmental considerations associated with O&M activities

Receptor	Sensitivities	Seasonal considerations
<b>Benthic ecology</b>	The impacts of maintenance of the OSP and export cables, including the use of jack-up vessels, were considered to be negligible in the ES and SEIS due to the localised, infrequent short-term nature of disturbance of the benthos.	None identified
<b>Fish and shellfish</b>	The ES and SEIS noted sensitive periods during spawning for herring (August-September) and cod (April). However, potential significant effects were noted as a result of pile-driving noise and there will be no such pile-driving in the O&M phase.  Effects in relation to O&M activities, including effects from major component repairs or replacements and vessel activity, were not identified as a primary concern and impacts were not assessed in the ES or SEIS.	None identified

Receptor	Sensitivities	Seasonal considerations
<b>Marine mammals</b>	The impacts of vessel activity on marine mammals in the O&M phase were considered to be negligible in the ES and SEIS in terms of vessel noise.  Effects in relation to other O&M activities were not identified as a primary concern and impacts were not assessed in the ES or SEIS.	None identified
<b>Ornithology</b>	Effects in relation to O&M activities, including effects from major component repairs or replacements and vessel activity, were not identified as a primary concern and impacts were not assessed in the ES or SEIS.	Post colony dispersal of auks takes place in the last two weeks of July and first two weeks of August. Large rafts of birds may be present on the sea at this time. Mitigation measures are described in the OTA VMP and the OEMP
<b>Commercial fisheries</b>	The impacts of vessel activity (CTV and SOV) on commercial fisheries in the O&M phase are likely to be minimal. However, fishing activity may be temporarily displaced during major maintenance and post-construction survey activity. The OTA FMMS shall be followed at all times to manage interactions and mitigate impacts.	None identified

No other sensitivities or seasonal considerations have been identified, both in the ES and subsequently. The results of the monitoring undertaken in accordance with the Project Environmental Monitoring Programme may indicate additional sensitivities which may necessitate changes to the O&M approach. In these cases, this OTA OMP will be updated accordingly.

Should additional marine licences be required for major maintenance activities, environmental assessments would be conducted prior to any licensable works commencing to ensure appropriate mitigations are in place for the duration of the works.

## 5.2 Good Working Practices

Seagreen will require that good working practice is applied by Seagreen personnel and contractors throughout O&M, seeking to minimise the risks to personnel, other sea users and the environment.

Good working practices applicable to O&M are set out in the approved Consent Plans detailed in Section 1.4 and Table 1.2.

There are a number of good practice guidance documents that have been produced for or apply in relation to the offshore renewables industry in recent years. Where relevant, Seagreen will require that such good

practice is reflected in procedures and method statements produced by Seagreen personnel and contractors, noting that all such guidance shall be applied to the specific location/jurisdiction, design, operational requirements and ES commitments of the Seagreen project. Relevant industry guidance documents are listed in Appendix C.

The OEMP sets out a range of environmental management procedures to be applied throughout the O&M phase to manage and mitigate environmental risk. The OEMP will be relevant throughout the operational lifetime of the OTA from first commissioning until OFTO transfer.

## 6. Compliance with the ES and ES Addendum

The ES and ES Addendum for the Seagreen project detailed the proposed approach to O&M and included a number of mitigation commitments that would apply to O&M activities. Appendix D presents the O&M activities described in the ES and ES Addendum and provides cross-references to where each commitment is implemented in this OMP.

A complete register of the environmental mitigation, management and monitoring commitments made in the ES and ES Addendum is set out in the Commitments Registers included as part of the OEMP.

## 7. References

Table 7.1 Seagreen Document References

SWEL Document Number	Title
LF000009-CST-OF-PRG-0004	Offshore Wind Farm Assets Operations and Maintenance Plan
LF000009-CST-OF-PLN-0001	Operations Environmental Management Plan
LF000009-CST-OF-PLN-0012	Marine Pollution Contingency Plan
LF000009-CST-OF-PRG-0003	Project Environmental Monitoring Programme
LF000009-CST-OF-PLN-0002	Marine Archaeology Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD)
LF000009-CST-MA-PRG-0003	Decommissioning Programme

## Appendix A – OMP List of Abbreviations and Definitions

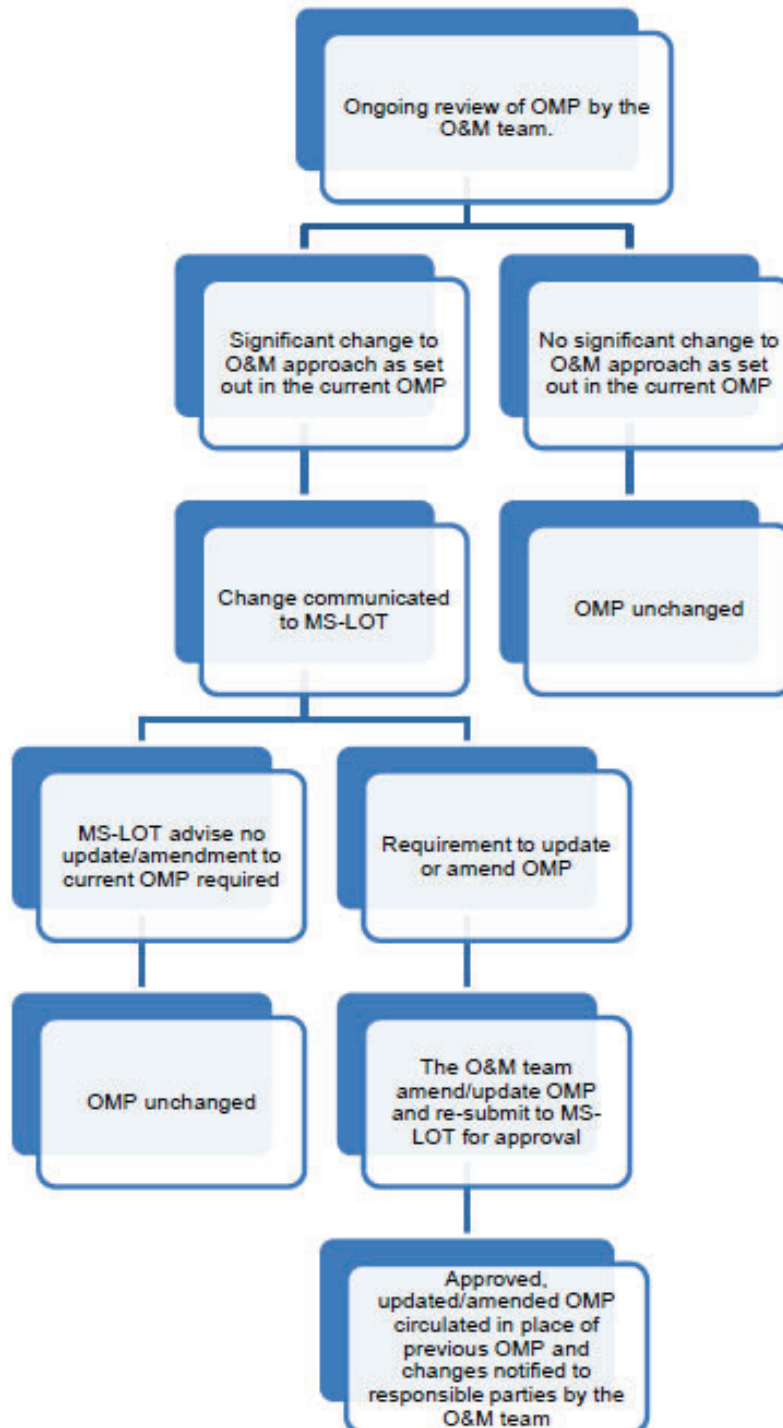
Term	Description
AC	Alternating Current
ADP	ALARP Design Procedure
AIS	Automatic Identification System
AIP	Aeronautical Information Publication
ALARP	As low as reasonably practicable
AMS	Asset Management System
ANO	Air Navigation Order
AtoN	Aids to Navigation
BEIS	Department for Business Energy and Industrial Strategy [now Department for Energy Security and Net Zero]
CAA	Civil Aviation Authority
CCTV	Closed-Circuit Television
Cd	Candela
CFWG	Commercial Fisheries Working Group
CGOC	Coastguard Operations Centre
CLV	Cable Lay Vessel
CMB	Cable Marker Board
CMS	Construction Method Statement
COLREGS	International Regulations for the Prevention of Collisions at Sea
Consent conditions	The terms that are imposed on Seagreen under the Marine Licence(s) that must be fulfilled throughout the period that the licences are valid
Consent Plan	Plan requiring approval by Scottish Ministers and as stated within the conditions of the Section 36 Consents and/or Marine Licence(s)
Contractor	A contractor appointed by to carry out O&M work packages
CPS	Cable Protection System
CTV	Crew Transfer Vessel
DGC	Defence Geographic Centre
DSLIP	Development Specification and Layout Plan
EMP	Environmental Management Plan

Term	Description
EMS	Environmental Management System
ERCoP	Emergency Response and Co-operation Plan
ERP	Emergency Response Plan
ES	Environmental Statement
FIR	Fisheries Industry Representative
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
Ft	Feet
HAT	Highest Astronomical Tide
HIRA	Hazard Identification and Risk Assessment
HLV	Heavy Lift Vessel
HTV	Heavy Transport Vessel
HV	High Voltage (220kV or above)
IAC	Inter-array cable
IALA	International Association of Lighthouse Authorities
ID	Identification
IHO	International Hydrographic Organisation
IMCA	International Marine Contractor Audit
IMO	International Maritime Organization
IPS	Intermediate Periphery Structure
ISV	Installation Support Vessel
JNCC	Joint Nature Conservation Committee
JUV	Jack-Up Vessel
KISCA	Kingfisher Information Services and Cable Awareness
kV	kilovolts
LMP	The Lighting and Marking Plan
LOA	Length Overall
Marine Coordination	The management and surveillance of people, vessels and offshore structures to ensure the safe preparation and execution of offshore activities, in order to minimise the probability of an incident, and to provide effective response if an incident does occur

Term	Description
Marine Licence	A written consent granted by the Scottish Ministers under Part 4 of the Marine (Scotland) Act 2010 and/or Part 4 of the Marine and Coastal Access Act 2009
MCA	Maritime and Coastguard Agency
MCC	Marine Co-ordination Centre
MD-LOT	Marine Directorate Licensing and Operations Team
MF	Medium Frequency
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MMSI	Maritime Mobile Service Identity
MoD	Ministry of Defence
MPCP	Marine Pollution Contingency Plan
MV	Medium Voltage (33kV)
NATS	National Air Traffic Services
NLB	Northern Lighthouse Board
nm	Nautical mile
NOTAM	Notice to Airmen
NRA	Navigational Risk Assessment
NSP	Navigational Safety Plan
NtM	Notice to Mariners
NVIS	Night Vision Imaging System
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer. The OEM is a company that produced parts and/or equipment that now forms part of the Wind Farm Assets.
OEMP	Operational Environmental Management Plan
OFTO	Offshore Transmission Owner
OREI	Offshore Renewable Energy Installation
OMP	Operation and Maintenance Programme
OSP	Offshore Substation Platform
OTA	Offshore Transmission Assets (as defined in the OTA Marine Licence): the OSPs, export cables up to Mean High Water Springs

Term	Description
OTA Marine Licence	Marine Licence granted on 10 October 2014 (as subsequently amended) authorising the construction and operation of the Seagreen OTA
OWF	Offshore Wind Farm
PAD	Protocol for Archaeological Discoveries
PEMP	Project Environmental Monitoring Programme
RAM	Restricted in their Ability to Manoeuvre
RAMS	Risk Assessment and Method Statement
ROV	Remotely Operated Vehicle
SAH	Significant Accident Hazard
SAR	Search and Rescue
SCADA	Supervisory Control and Data Acquisition
Seagreen	The organisation within SSE Renewables responsible for the O&M of the Seagreen OTA (until OFTO transfer)
SEIS	Supplementary Environmental Information Statement
SHE	Safety, Health and Environment
SMS	Safety Management System
SNH	Scottish Natural Heritage (now known as NatureScot)
SOLAS	Safety of Life at Sea
SOV	Service Operations Vessel
STCW	Standards for Training, Certification and Watch Keeping
TTP	Traffic and Transportation Plan
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
VHF	Very High Frequency
VMP	The Vessel Management Plan
VTS	Vessel Traffic Scheme
Wind Farm Assets	Assets forming the Seagreen Alpha and Seagreen Bravo OWFs: the WTGs, their foundations, and the IACs up to - but not including - the OSPs [covered under a separate OMP]
WnoO	Weekly Notice of Operations
WTG	Wind Turbine Generator
WZs	Navigational warnings

## Appendix B – OTA OMP Change Management Procedure



Note: ‘Significant’ changes to O&M approach may include changes to contracting arrangements, major emerging maintenance requirements based on manufacturer recommendations or results of ongoing monitoring, changes in response to incidents or asset failures, new/updated legislative requirements or industry good practice guidance. Seagreen will consult with MD-LOT with regard to the significance of any changes and the requirement to update this OMP.

## Appendix C – Good Working Practice Guidance

Note: Where guidance listed here is revised, the most up to date version shall apply. As guidance develops, some guidance listed here may be superseded or become obsolete. While every effort will be made to keep this Appendix up to date, contractors are required to ensure they refer to the most up to date guidance and to any other guidance not listed here that is applicable to their work scope.

Publisher	Title	Scope
G+	Working at height in the offshore wind industry (2 <sup>nd</sup> edition - July 2018)	Covering design, construction, commissioning, and operation; designed to reduce the need for work at height; topic guidance sheets, covering common hazards, personal protective equipment, training and competence, fitness requirements, and the responsibilities of those procuring, supervising and undertaking work; with supporting information, such as regulatory requirements in selected EU countries (including the UK) and technical standards
	The safe management of small service vessels used in the offshore wind industry (2 <sup>nd</sup> edition - January 2018)	Cover working with vessels that have a gross tonnage of less than 500, such as crew transfer vessels, guard vessels, survey vessels and construction support vessels. The guidelines cover audit and inspection regimes for wind farm service vessels, operating procedures for routine marine operations, training and competence of crew and passengers, and safety equipment
	Integrated Offshore Emergency Response (IOER) – Good practice guidelines for offshore renewable energy developments (1 <sup>st</sup> edition – October 2019)	Guidance on identifying offshore renewables risks and planning and delivery of an effective emergency response
	Good practice guidelines – Offshore wind farm transfer (1 <sup>st</sup> edition – July 2020)	Guidance on executing safe transfers of personnel in an offshore wind farm
	Good practice guidelines for safe helicopter operations in support of the global offshore wind industry (1 <sup>st</sup> edition – February 2021)	Guidance on the planning and execution of safe helicopter operations for logistical support and emergency response in offshore wind farms

Publisher	Title	Scope
Energy Institute	UK Wind Turbine Safety Rules (4th edition - 2021)	A model template of rules and procedures to help formalise a safe system of work to manage the significant risks associated with a wind turbine
Renewables UK	Offshore Wind and Marine Energy H&S Guidelines (Issue 2 – 2014)	H&S guidelines for the offshore wind sector covering all phases of development and identifying risks and significant safety hazards and activities
	Safety Circular: Notices to Mariners. Guidance for Offshore Wind & Marine Projects (2013)	This Circular provides a short summary of the accepted scope and format for issuing Notices to Mariners
	FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison (2014)	Sets out best practice guidance on liaison between the offshore wind industry and the fishing industry
	Guidelines for Selection and Operation of Jack-ups in the Marine Renewable Energy Industry (Issue 2 - 2013)	Industry guidance aimed at jack-up owners, operators, developers and contractors engaged in site-investigation, construction, O&M of offshore wind and marine energy installations
	First Aid Needs Assessment – Guidance for renewable energy projects (2013)	Provide basic information on how duty holders can assess the provision of adequate and appropriate equipment, facilities and personnel to ensure employees receive proper attention if they are injured or taken ill at work.
	Vessel Safety Guide - Guidance for offshore renewable energy developers (2015)	Provides guidance and insight on the selection and maintenance of vessels through all phases of wind farm development
NatureScot	The Scottish Marine Wildlife Watching Code (2017)	A code of conduct for marine users who may encounter marine wildlife during their activities, aiming to minimise the risk of harm to marine wildlife and minimise disturbance
MCA	The Workboat Code (2014)	Construction standard for small workboats (<24m load line length) in commercial use
Partnership campaign between government,	Clean-Check-Dry	A requirement for all submersible / immiscible equipment e.g., Remote Operated Vehicles (ROVs) (if required) to be subject to pre-use and post-use checks including checks for the presence of marine growth following check-clean-dry principles. All equipment will be required to be free of marine

Publisher	Title	Scope
recreational bodies and others.		growth prior to mobilisation.

**Appendix D – Summary of O&M Activities (as proposed in ES and ES Addendum) (OTA)**

Source	Reference (ES Chapter)	Details of commitment	Implementation
ES September 2012	Project Description – 5.236	Unscheduled repair activities will range from attendance on location to deal with the resetting of false alarms to major repairs.	Section 4.3 – Unscheduled Maintenance Activities Section 4.4 – Major Component Repairs
ES September 2012	Project Description – 5.238	The Project Alpha and Project Bravo operators will have an O&M team in place for the day-to-day management and control of the OWF infrastructure. This is expected to be based in purpose built onshore O&M Control Centre facilities, ideally situated on the quayside at the chosen operations port location.	Section 2.2 - O&M Base and Marine Co-ordination Centre
ES September 2012	Project Description – 5.239	In order to manage the post consent and ongoing site monitoring requirements, it is likely that a combination of dive support vessels and ROVs will be used to undertake inspection of foundations, scour protection, cables and any other subsea infrastructure.	Section 4.2 – Routine Service Activities



**Document Reference**

LF000009-CST-OF-PRG-0004

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