Marine Operations Manual

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Document Approval

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Revision Change Notices

Rev	Location of Change	Brief Description of Change
3	All	New requirements for PSV with DNV Ice class and/or X-bow type bow
2	Appencix B	Requirements for ERRV / Standby vessel at Gjøa field
1	All	Supersedes old: " Offshore IMR Vessel requirements (C097-GDF-U-SP-0012)

Table of Contents

1. INTRODUCTION

This document outlines Neptune Energy`s requirements to marine operations performed for Neptune Energy on the Norwegian continental shelf. The document is intended to be used as basis for the planning and execution of marine operations. It also sets the requirements to the marine vessel assurance process mandatory for all vessels on contract for Neptune Energy.

2. PURPOSE

This purpose of this document is to set the requirements of Neptune Energy to marine operations performed for Neptune Energy on the Norwegian continental shelf.

3. SCOPE

The scope of this document is marine operations carried out at Neptune Energy offshore installations and subsea assets. Requirements to planning and execution of subsea operations, such as pipelay and ROV inspections are described in the Neptune Energy Subsea Operations Manual.

4. OWNERSHIP AND ADMINISTRATION

Ownership and maintenance of this document is the responsibility of the Structure & Marine Lead Engineer, Neptune Energy Operations.

5. TERMINOLOGY/ABBREVIATIONS

Terminology	Definition
DP System	Dynamic Positioning system (DP system) means the complete installation necessary for dynamically positioning a vessel comprising, but not limited to, the following sub-systems: • power system; • thruster system; and • DP control system.
Safety Zone	The area around an installation, including all subsea installations, within which entry is prohibited without permission of the OIM or his deputy.
Shall	The word 'shall' mean that compliance is mandatory
Should	The word 'should' indicate a preferred action
Abbreviation	
AHTS	Anchor Handling Tug and Supply
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
ARPA	Automatic Radar Plotting Aid
ASOG	Activity Specific Operating Guidelines
CAM/CAMO	Critical Activity Mode
CDSR	Company Designated Site Representative
CMID	Common Marine Inspection Document
CPA	Closest Point of Approach
DP	Dynamic Positioning
DPO	Dynamic Positioning Operator
ETA	Estimated time of arrival
FMEA	Failure Mode and Effect Analysis
FMECA	Failure Mode Effects and Criticality Analysis
FRC	Fast Rescue Craft
GOMO	Guidelines for Offshore Marine Operations
HAZID	Hazard Identification
HITRA	Hazard Identification Risk Assessment
HPR	Hydroacoustic Positioning Reference
HSEQ	Health, Safety, Environment and Quality

IMCA	International Marine Contractors Association
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organisation
ISM	International Safety Management
LOLER	Lifting Operations and Lifting Equipment Regulations
LSA	Life Saving Appliances
MOU	Mobile Offshore Unit
NCS	Norwegian Continental Shelf
NOROG	Norwegian Oil and Gas Association
SDPO	Senior Dynamic Positioning Operator
SMC	Safe Manning Certificate
SMS	Safety Management System
TCPA	Time to Closest Point of Approach
UMS	Unmanned Machinery Space
UPS	Uninterruptible Power Supply

6. EXPECTATIONS, STANDARDS & POLICIES

The standards and policies contained within this manual are to be considered in addition to relevant national and international regulations and industry guidelines. All personnel engaged in marine operations for Neptune Energy must understand and comply with all applicable regulations and guidelines in addition to the standards and policies defined in this standard.

Any deviation from this manual shall be subject to Management of Change in accordance with Neptune Management System.

6.1 Context and Application

This standard complements applicable international and national regulations and guidelines. Each asset shall have processes and procedures relevant to their activities and operations to comply with this standard and applicable regulatory requirements.

6.2 List of Relevant Standards and Guidance Documents

The following standards are regarded as a Company requirement and shall be complied with. The latest revision available shall always apply.

6.2.1 Marine Operations:

- Norway's Regulation relating to health, safety and the environment in the petroleum activities and at certain offshore facilities (The Framework Regulations)

- Norway's Regulation relating to conducting petroleum activities (The Activities Regulations)
- NOROG 091- Recommended Guidelines for Securing Supplies and Materials
- Guidelines for Offshore Marine Operations (GOMO)
- GOMO Regional Supplement for Norway: Selskap spesifikke retningslinjer for Neptune Energy
- IMO: The polar code (MSC Res.385(94))
- DNV GL ST-N001 Marine operations and marine warranty
- DNVGL-RP-N101 Risk management in marine and subsea operations
- IMCA M 203 Guidance on simultaneous operations (SIMOPS)

6.2.2 Dynamic Positioning:

- IMO MSC 645 Guidelines for Vessels with Dynamic Positioning Systems
- IMO MSC 1580 Guidelines for Vessels and Units with Dynamic Positioning (DP) Systems
- IMCA M 103 Guidelines for the design and operation of dynamically positioned vessels
- IMCA M 117 The training and experience of Key DP personnel
- IMCA M 166 Guidance on failure modes and effects analysis
- IMCA M 182 International guidelines for the safe operation of dynamically positioned offshore supply vessels
- IMCA M 190 Guidance for developing and conducting annual DP trials programmes for DP vessels
- IMCA M 220 Guidance on operational activity planning

6.2.3 Anchor Handling and towing operations:

- Norwegian Maritime Authority regulation for positioning and anchoring systems on mobile offshore units (Anchoring Regulations 09)

6.2.4 Diving Operations:

- NORSOK U-100 Manned Underwater Operations
- NORSOK U-101 Diving Respiratory Equipment
- IMCA D 010 Diving operations from vessels operating in dynamically positioned mode
- IMCA D 023 Diving Equipment Systems Inspection Guidance Note (Design) for surface orientated (air) diving systems
- IMCA D 024 Design for saturation (bell) diving systems
- OTH 90 336 Guidelines for Air Range Diving Support Vessels
- DMAC-12 Safe Diving Distance from Seismic Survey Operations

6.2.5 ROV Operations:

- NORSOK U-102 Remotely operated vehicle (ROV) services

- IMCA R 004 Guidance for the Safe and Efficient Operation of Remotely Operated Vehicles

6.2.6 Lifting Operations:

- NORSOK R-002 Lifting equipment
- NORSOK R-003 Safe use of lifting equipment
- IMCA M 187 Guidelines for lifting operations

6.2.7 Personnel transfer:

- NORSOK R-003 Safe use of lifting equipment
- Guidelines for Offshore Marine Operations (GOMO)

6.2.8 Pipelay / Umbilical / Cable Lay Operations:

- DNV GL ST-F101 Submarine Pipeline Systems or equivalent

6.3 Contractor's Policies and Standards

Marine activity contractors contracted by Neptune Energy shall have a certified and documented Safety Management System (SMS) comprising various policies, practices, and procedures. Neptune Energy will expect the contractor to manage their own worksite in accordance with their own SMS. If there is a lack of alignment with Neptune Energy policies and expectations identified through the assurance process, or where the contractor's SMS does not address a specific issue, then Neptune Energy policies and expectations shall be applied. The specific application of Neptune Energy and contractor systems shall be as agreed and documented in SMS interface documents where applicable.

7. ROLES & RESPONSIBILITIES

7.1 Offshore Installation Manager

The Offshore Installation Manager (OIM) on the Offshore Installation is the senior representative of Neptune Energy in the field. He/she is responsible for ensuring all activities in the field are carried out safely, efficiently, in accordance with Neptune Energy governing documents and in accordance with Norwegian legislation.

Contractor's vessels are not permitted to commence operations within the Offshore Installation safety zone or adjacent to any Installation subsea assets without the permission of the OIM or his/her designate. Marine activities in the field require a Neptune Energy work permit. These shall be approved by the OIM, or his designate on the Offshore Installation.

7.2 Deck & Marine Manager

The Deck & Marine Manager stationed on the Offshore Installation is the main point of contact for day to day decision making, assistance requests, and advice from the Neptune Energy offshore team. If no other person is designated for the task, he/she will assist with permit to work applications and authorisation, and coordinate any marine operations activities requiring actions by personnel onboard the Offshore Installation. The Deck & Marine Leader is responsible for verifying that all vessels contracted by Neptune Energy in Norway are suitable for their intended operation..

7.3 Lead Engineer, Structure & Marine

The Lead Engineer, Structure & Marine is responsible for the content and maintenance of this document. This to ensure compliance to governing regulations and standards for offshore marine operations.

7.4 Vessel Assurance Provider

Specialist Company or person appointed to undertake the vessel assurance process and advice on specialist marine matters on behalf of Neptune Energy.

7.5 Vessel Master

The vessel master is ultimately responsible for the safety of the crew, vessel and cargo. The master shall ensure that all international and local regulations are followed and ensure compliance to Contractor`s management policies and procedures.

The vessel master shall follow sailing instructions from Neptune Energy Logistic Operation and maintain economical speed if not instructed otherwise. It is expected that the vessel master will be proactive and continuously evaluate if it is necessary to make changes to the sailing instructions received.

If the vessel master is in doubt if mission information received is adequate the master shall contact Neptune Energy Logistic Operations or the onboard Company Representative and inform about this.

7.6 Company Representative

The Company Representative shall be the formal point of contact for Neptune Energy onboard contractors' vessel. On behalf of Neptune Energy, lead the work and ensure that regulatory requirements, internal requirements and project specific marine operations procedures are followed. Roles and responsibilities are summarized in "Vessel Offshore Company Representative Roles and Responsibilities".

7.7 Marine Warranty Surveyor

Marine Warranty Surveyor (MWS) shall be contracted as necessary in order to satisfy the insurance warranty. When required as a condition of the insurance the MWS shall approve specific marine operations activities. This will usually involve review and approval of marine operations procedures and documentation and site / vessel attendance.

8. RISK MANAGEMENT

8.1 Risk management

The DNV GL standard *DNVGL-RP-N101 Risk management in Marine Operations and Subsea operations* shall be considered for planning and execution of marine operations. Neptune Energy Management System processes shall be used for the risk assessment process when planning activities for Neptune Energy. Relevant personnel from Company and third-party representatives shall be invited in due time to attend risk assessments, HAZIDs and HAZOPs.

High-level Hazard Identification (HAZID) should be performed as soon as possible after identifying the work scope.

The following should be present during the HAZID process for marine activities, but not be limited to:

- Appropriate marine subject matter expert(s) as necessary
- Competent representation from the vessel or vessel operator
- Appropriate representatives from Neptune Energy

Safeguards against all identified hazards should be implemented and included in task-specific procedures. Hazards shall be identified during the Hazard Identification (HAZID) process and managed during the Hazard Identification Risk Assessment (HIRA) process. Identified hazards including residual risk which have been reduced to As Low As Reasonably Practicable (ALARP) are to be included in procedures, toolbox talks, and safety meetings. All Asset-specific marine hazards are to be identified within the relevant site-specific marine documentation.

Prior to commencement of any marine operational work-scopes for Neptune Energy it is mandatory that all relevant risk assessments, safe job analysis and toolbox talks have been completed, documented and reviewed by all personnel involved in the operation. The necessary permits to work shall be in place.

8.2 Contingencies

Contractors are required to have contingency procedures in place in the event of incidents, mechanical breakdown, or adverse weather, as identified and found necessary from the risk assessment process. The contingency procedures shall be reviewed by Neptune Energy.

9. EMERGENCY PREPAREDNESS

Contractor's vessels and their marine and senior project personnel shall be audited for emergency preparedness. Emergency preparedness for the vessel and personnel on board is expected to include as a minimum:

- Vessel Emergency Procedures
- Project / work scope specific bridging document that contains emergency contact details.
- Functioning and regularly maintained firefighting and emergency evacuation equipment.
- Designated firefighting / emergency rescue teams that practice regularly.
- Facilities for dealing with injured personnel and their evacuation from the vessel if required.
- Fully equipped and operational lifeboats and / or life rafts, as required to maintain vessel certification.
- Regular crew musters and abandon ship drills.
- A functioning man overboard boat (MOB).
- Regular wet tests of the MOB.
- Appropriate emergency signposting and markings.

9.1 Bridging document

In advance of all marine operations, the Contractor shall prepare and issue for Neptune Energy approval a bridging document. The purpose of the bridging document is to bridge the safety management system (SMS) of the Contractor and Neptune Energy for the duration of the work.
The bridging document shall also contain contact details for the Offshore Installation and the Contractors intervention vessel, their emergency response personnel and senior management onshore. Also listed will be emergency contact details for both Neptune Energy and the Contractor.

If the work is split into separate phases, for example involving a different vessel, or a large gap between mobilisations, a separate bridging document shall be prepared for each phase.
If the Contractor's work involves any SIMOPS with other vessels of his own or third parties, the Contractor will also bridge his SMS and those of all third parties for the duration of the work. This may be addressed either in a single combined Bridging Document, or separate documents if more appropriate.

The bridging document(s) shall be specific to the work to be carried out and the vessel(s) carrying out the work. A copy of the bridging document shall be issued for Neptune Energy approval in advance of mobilisation of the vessel(s) involved. The Contractor's vessel(s) will not be allowed to enter any Neptune Energy safety zone until the bridging document(s) have been approved by Neptune Energy, and copies have been issued to the Offshore Installation, Neptune Energy Emergency Response Control Room. The OIM, and the Offshore Installation control shall have access to a copy.

The bridging document shall contain an emergency notification flow chart (ENF). The purpose of the ENF is to provide details that can be viewed or printed in a single page format, for quick access in the event of an emergency, a basic description of the intervention vessel(s), the primary contact details of the vessel(s), the Offshore Installation, the field standby vessel, and the Contractors and Neptune Energy emergency response teams onshore. The emergency notification flow chart shall be presented in a format suitable for display in locations such as the Offshore Installation control room and Neptune Energy's emergency response room.

10. INCIDENT MANAGEMENT

For the purposes of this document "incident" mean any emergency, or reportable accident or near miss that affects the marine operations being carried out by the Contractor and his subcontractors for Neptune Energy. Such an incident may occur on, or affect the vessel, Contractor's personnel, or equipment, during mobilisation / demobilisation, transit to or from the field, or whilst in-field.

It is important that incidents are managed in an appropriate and consistent manner. This section outlines the Neptune Energy process and expectations for management of incidents that affect Neptune Energy marine operations, Contractors, and their subcontractors.

In the interest of shared learning and continuous improvement, Neptune Energy contractors are expected to advise Neptune Energy of any significant incidents that occur in any of their operations and to follow this with safety flashes, investigation reports and lessons learnt as they become available.

10.1 Incident Response

The Contractor and his subcontractors shall have carried out hazard identification and risk assessment processes prior to commencing all subsea activities. Work procedures will incorporate appropriate safety measures. The Contractor and his subcontractors shall also have prepared in advance contingency procedures for use in the event of all reasonably foreseeable accidents or emergencies, whether subsea or marine, on the vessel or in the proximity of the vessel.

The OIM on the Offshore Installation has prime responsibility for directly managing the response to incidents occurring on the Offshore Installation or originating from any field subsea assets. The OIM and the Control Room on the Offshore Installation shall have access to a copy of the Contractor's bridging document which shall contain emergency contact details for the Contractor`s vessel, his emergency response personnel and senior management onshore.

The Emergency Notification Flowchart (ENF) shall be available.

Where any such incidents will or may affect the Contractor's vessel, the OIM, or the offshore Control Room shall contact the Vessel Master on the Contractor's vessel as soon as practicably possible, and advise what measures should be taken by the Contractor's vessel.

However, in the event of an incident on Offshore Installation, the OIM and the Control Room personnel may be too busy to advise the Vessel Master in the initial stages of the incident. Therefore, in the event that the vessel is within the safety zone and alarms can be heard on the installation, or it appears that an incident may be occurring, the Vessel Master shall ensure that marine operations halt, the worksite is made safe, and then await instructions from the OIM or the Control Room.

If it is clear that the incident on the Offshore Installation is major, or the Vessel Master cannot get advice from the installation, the Master shall halt all marine operations and move his vessel outside the safety zone until he is advised by the OIM or the Control Room that it is safe to return.

The Vessel Master on the Contractor's vessel has prime responsibility for directly managing the response to incidents occurring on his vessel. The Vessel Master shall have access to a copy of the Contractor's bridging document which shall contain emergency contact details for the Offshore Installation, Neptune emergency response contacts onshore, and the Contractor's emergency response personnel and senior management onshore.

Where any such incidents will or may affect the Offshore Installation or any of the field subsea assets, (for example a DP failure on the vessel), the Vessel Master shall halt operations, make the worksite safe and move the vessel outside the Offshore Installation safety zone as quickly as possible, if the vessel is inside the safety zone, or at least 500m away from any field assets, until the incident is resolved and the OIM approves resumption of the operation.

11. HSEQ

All contractors` activities shall be carried out in accordance with their Safety Management System (SMS) and their HSEQ policy.

Neptune Energy HSEQ requirements to Contractors marine operations include the following:

11.1 General

- A project briefing shall be carried out on the vessel during mobilisation. Neptune Energy values, safety rules and expectations shall be communicated. The work scope shall be explained to the personnel on the vessel.
- All Contractor's work shall be carried out using approved procedures.
- Contractor's work shall be carried out under appropriate Neptune Energy or drill rig or vessel work permits.
- Toolbox talks and Safe Job Analyses (SJA) shall be carried out on the vessel, and include personnel who will carry out the work, prior to the start of each new work task.
- All personnel on the Contractor's vessel, including sub-contractors during mobilisation and demobilisation, shall use appropriate PPE.

11.2 Vessel

- All new personnel on Contractor's vessels shall go through a vessel induction process.
- Emergency drills /personnel musters shall be carried out on Contractor's vessels on a regular basis.
- Entry to hazardous areas shall be restricted to authorised personnel who have appropriate PPE and / or breathing equipment and work and / or entry permits.
- Lifts carried out entirely onboard the vessel shall be controlled by the Contractor's safety management system, and where appropriate under a vessel permit to work.

12. COMMUNICATION

Neptune Energy shall provide the vessel with all relevant information and instructions prior to departure from port. In field communication methods, notifications and reporting requirements is described in the following. Installation specific communication details can be obtained at GOMO and Offshore Norge, Norwegian Guidelines, Neptune Energy.

Communication in the event of an emergency shall be in accordance with established Bridging document and Emergency Notification Flowchart.

12.1 Offshore Activity Notification

Offshore Activity Notification (OAN) shall be sent by the vessel to the installation as follows:

1. 48 hours prior to Estimated Time of Arrival (ETA)
2. 24 hours prior Estimated Time of Arrival
3. 2 hours ETA
4. 1 hour ETA

12.2 Voyage Reporting

All vessels except PSV and Standby Vessels shall provide a Daily Progress Report (DPR) daily. Vessels working in the Field or on associated pipelines and subsea infrastructure shall maintain regular communications with the Offshore Installation and any other vessels operating in the vicinity.

13. THIRD PARTY OPERATIONS AND SIMOPS

Third party operations are those carried out by third parties at the same time as the Contractor's operations, without conflict, and without the need for special procedures to allow the operations to be carried out safely.

SIMOPS are operations carried out simultaneously by non-moored intervention vessels in close proximity which require special procedures to allow the operations to be carried out safely.

Marine activity coordination and SIMOPS evaluations shall performed in accordance with Neptune Energy management system.

In the event that the Contractor is required to carry out operations defined as SIMOPS, Contractor shall prepare a SIMOPS procedure. This shall describe in detail how the operation will be carried out safely. In particular:

- Positioning of the adjacent vessels.
- DP reference systems to be used
- Subsea equipment to be employed such as ROVs will be detailed, as well as
- Aspects such as tide and weather and daylight or night-time working.

If a third party non-moored vessel can be temporarily moved out of the vicinity of the Contractor's vessel, a SIMOPS procedure will not be required.

14. ADVERSE WEATHER

The North Sea is an extreme environment, weather forecasts are of variable reliability and the weather can change at short notice. All mobilisations of Contractor's vessels must be coordinated with Neptune Energy. This is partly to prevent work conflicts. It is also to avoid as far as possible vessels arriving in the field during unambiguous forecasts of bad weather.

The Master of any vessel in the Gjøa field is responsible for the safe operation of his vessel. This includes deciding when to stop work, or not commence work, not to transit to the field, or run for shelter because of adverse weather. Neptune Energy does not expect Contractor's vessels to transit to or from the field in severe weather, or ride out such weather in the field unnecessarily. All Contractors' operating procedures shall specify weather limits at which operations should cease or not commence. The controlling weather limits may be swell or current or wind or a combination of all three.

Contractors are also required to have contingency procedures in place in the event of sudden weather deterioration part way through operating procedures. An example could be to wet store a subsea lift on the seabed if weather suddenly deteriorates. Operating and contingency procedures also need to address "blow on" and "drift on" scenarios.

15. PERMIT TO WORK

Neptune Energy operates a permit to work system, all marine operations for Neptune Energy require an approved Neptune Energy work permit prior to start up.
All marine activities within the Offshore Installation safety zone will require a level one work permit. Operations within the safety zone of field producing structures, or drill rigs anywhere in the field will require a Neptune Energy work permit. For these activities, the work permit will normally be approved by the OIM on the Offshore Installation. For activities within the safety zone of drill rigs, the work permit will normally be issued by the drill rig.
Intrusive activities on producing structures, riser bases, pipelines, or umbilicals will require a Neptune Energy work permit as a minimum. Depending on the scope of work, a hot work permit may be more appropriate. Some intrusive activities may also require isolation and / or well handover certificates.
Welding or burning operations required on the deck of Contractor's vessels are not permitted within the Offshore Installation safety zone or within safety zone of any drill rigs in the field. However, welding or burning operations required on Contractor's vessels may be permitted if it is carried out in an enclosed space within the vessel, and approved by the OIM on the Offshore Installation or drill rig.
The Neptune Energy Offshore Representatives shall handle Neptune Energy work permits where they are required. If Neptune Energy does not provide Offshore Representatives for a particular marine

operation, senior Contractor's personnel from the vessel shall handle the Neptune Energy work permits.

Project specific Bridging Documents shall cover more details about obtaining work permits.

16. MARINE VESSEL ASSURANCE

16.1 General

The marine vessel assurance process is an auditable system that shall be undertaken by qualified personnel. The extent of the vessel assurance is depending on the type of vessel and intended operation. A Marine Assurance Service Provider shall be contracted when considered necessary depending on availability and competency of internal resources. The marine vessel assurance process shall be complete with all actions closed prior to any work being carried out on behalf of Neptune Energy.

The marine vessel assurance process shall demonstrate that all vessels on contract for Neptune Energy fulfil the following :

- Meet minimum required Industry and Neptune Energy standards
- Are fit for purpose and suitable for their intended operation
- Minimise the risk to the people, environment, vessel / installation, and business

16.2 Application

The vessel assurance process is applicable to all vessels on contract for Neptune Energy and to all third-party vessels operating within Neptune Energy controlled areas. It does not apply to third party activities on board Neptune Energy chartered vessels.

16.3 Third Party Vessel Assurance

Any third party performing vessel activities within Neptune Energy controlled areas shall provide the following information to Neptune Energy:

- Confirmation that a marine assurance processes have been conducted for the respective vessel(s)
- Description clarifying the extent of the marine assurance process, including documents reviewed and vessel inspections/audits.
- Confirmation that the marine assurance process has been completed and that all actions are closed
- Confirmation that the vessel is found fit for purpose, suitable for the intended operation and meet all requirements to health, safety and environment.

The marine assurance work shall be performed by qualified personnel, specialist marine assurance provider or equivalent. The technical knowledge, experience, and competence of the personnel performing the marine assurance work shall be appropriate to the type of vessel and intended operation. Neptune Energy shall review and accept the marine assurance work performed by any 3rd party prior to commencement of operations within Neptune Energy controlled areas.

16.4 Vessel Assurance Process

All vessels contracted by Neptune Energy shall be subject to the Neptune Energy HSE inspection, which is valid for 12 months from the date of the inspection. For all vessels, the assurance process shall include the following as found relevant by Neptune Energy:

- Annual general marine safety inspection using the OCIMF Offshore Vessel Inspection Database (OVID) format
- Crane inspection when deemed necessary
- Personnel certification, training, competence, experience, and manning review
- Dynamic positioning systems audit to ensure compliance with IMCA guidelines when deemed necessary.
    - Valid DP FMEA document with reviews minimum every fifth year.
    - 5-yearly DP Trials.
    - Annual DP Trials (as per IMCA M190 Guidelines).
- Project-specific and/or mission systems audits shall be determined on a case-by-case by Neptune Energy.
- DP capabilities review with respect to the intended operation as deemed necessary by Neptune Energy.
- A bridge team audit shall be conducted if any Master or Chief Officer has less than 6 months experience in rank.
- Bridge team audits shall be conducted annually per crew for all long term chartered vessels.
- Annual IMCA Design Diving System (D023 and D024) Audit for Diving support vessels.
- Diving support vessel shall provide compliance matrix towards NORSOK U-100 and NORSOK R-003 requirements prior to audit of vessel dive system.
- Annual IMCA ROV System (R006) Audit for ROV and Diving support vessels.

For vessels that have been contracted for Neptune Energy within the last 12 months and have been subject to the marine assurance process, a reduced marine assurance process may be considered. This will be defined on a case by case basis based on the planned scope of work. The reduced assurance process could be conducted by a desktop review and/or onsite inspection as considered necessary.

16.5 New build, Laid Up vessels or Newly Converted Vessels

For new-build or newly converted vessels the assurance shall take into consideration the lack of operating experience of the vessel and crew. The extent of the assurance process shall be addressed on a case by case basis but as a minimum include review of the following:

- Commissioning and FMEA trials (including DP where applicable)
- Operator's acceptance trials
- Experience of personnel on similar or identical vessels and systems
- Supervised programme of on-board training and familiarisation

- Demonstration that all planned maintenance tasks can be completed successfully, and critical spare parts are in place on board
- Validity and robustness of vessel and operator's management systems, manuals, procedures
- Verification of certification and associated systems
- Vessel contingency and emergency drills and exercises

16.6 Reporting

The results of the vessel assurance shall be communicated to Neptune Energy by:

- Observations that may cause delays to the project, shall be informed to Neptune Energy as soon as possible.
- Written assurance report within two workdays
- Prioritized and tracked within appropriate timescales

When it is concluded that the vessel satisfy Neptune Energy requirements to Health, Safety and Environment, and the vessel is found suitable for the intended operations, a Marine Assurance Acceptance Letter (MAAL) is issued by the Deck & Marine Manager on behalf of Neptune Energy.

17. REQUIREMENTS APPLICABLE TO ALL VESSELS

All vessels on charter to Neptune Energy shall comply with the requirements of this section. These requirements are not intended to conflict with:

- Duties and responsibilities of a Master with regards to the safety of the vessel and crew
- Regulatory requirements
- Industry guidelines
- Vessel operator's management systems
- Good marine practice and seamanship

17.1 General

The vessel and associated equipment on board shall be suitable and fit for purpose for the contracted scope of work. All relevant documents and certificates related to the vessel and the safe operation of the vessel shall always be accessible for Neptune Energy during the contract period. The vessel shall carry a recognised flag. The flag shall be listed on the Paris MoU white list. Reference is made to www.parismou.org/. The IMO rules shall be ratified by the flag state.

17.2 Application

These requirements apply to:

- All MOUs, barges and vessels chartered by, or on behalf of, Neptune Energy

- All offshore installation supervisory staff who are involved in, or responsible for, marine activities
- All barges and vessels performing work within the safety zone of a Neptune Energy operated offshore installation or subsea asset.

17.2.1 Field/asset

All marine activities within a Neptune Energy safety zone or within a controlled area (including pipelines) shall have a Neptune Energy Permit to Work prior to the commencement of the activity.

17.2.2 Controlled area

In the presence of subsea assets with a defined safety zone, strict control shall be exercised over marine activity within their vicinity. This is known as a controlled area.
Masters and OIMs of all vessels and barges shall contact the appropriate platform control room to receive Permit to Work prior to entering a controlled area.

17.2.3 Collision Risks to Platform Structures and Risers

Vessels should have adequate contingency plans for potential problems near offshore installations, particularly various mechanical or control systems failure modes. These should be regularly exercised and tested.

17.2.4 Vessels Entering a Neptune Energy Safety Zone

Vessels entering a Neptune Energy Safety Zone must comply with this Marine Operations Manual and asset specific procedures and entry requirements.
The OIM or his delegate shall be immediately informed and advised of any deficiency or breakdown of vessel's equipment which may limit the performance or impair safe operation of the vessel in any way when inside the safety zone.

17.3 IMO requirements.

The vessel shall meet the requirements of IMO including all underlying conventions such as (but not limited to):

- SOLAS/LSA
- MARPOL
- STCW
- ISM Code
- MLC 2006

If a vessel deviates from any of the above listed items, this shall be evaluated on a case by case basis.

17.4 Classification Societies.

The vessel shall be classed by one of the following societies:

- DNV GL
- Lloyds Register of Shipping (LRS)
- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- Registro Italiano Navale (RINA)
- Nippon Kaiji Kyokai (NKK)

The vessel shall hold the following DNV GL notations, or equivalent by the applicable classification society:

- COMF-V(3) and C(3)
- CLEAN-DESIGN
- NAUT-AW
- DYNPOS AUTR or AUTRO
- DK(+)

Note! If a vessel deviates from any of the above listed items, this shall be evaluated on a case by case basis.

17.5 Manning of vessels

All vessels shall be manned to as a minimum satisfy their Flag State requirements, and hold a 'Safe Manning Certificate'.
It is the vessel operator's responsibility to ensure that the vessel is adequately manned to:

- Allow effective and safe operation, on a 24-hour basis if necessary
- Met operational requirements, in accordance to statutory and industry requirements
- Ensure crew have the necessary competence to undertake their assigned duties and in possession of the required certificates.

For manning during marine operations, this Marine Operations Manual and GOMO shall be followed.

17.6 Work Conditions

Offshore vessels shall comply with all relevant national and international maritime regulations regarding working conditions.

17.7 Safety Management

Each vessel shall have a Safety Management System appropriate to the vessel type and activity, and where required under the provisions of the ISM Code, shall be approved by the Flag State.

17.8 Planned Maintenance

There shall be a demonstrable planned preventative maintenance system in use on all vessels. This shall include certification of all relevant vessel and personal equipment in use. All uncertified equipment shall be isolated or quarantined to prevent unauthorised use.

17.9 Equipment Defects

The vessel shall immediately report any equipment defects that may affect the vessel performance, to project or vessel representative. The OIM shall be informed if working inside a Neptune energy controlled area.

17.10 Spark Arrestors

All vessels required to enter the safety zone of an installation must have spark arrestors or silencers that perform the same function fitted to all engine exhausts.

17.11 Lifting Equipment

All lifting equipment shall comply with the following standards:

- NORSOK R-002 Lifting equipment
- NORSOK R-003 Safe use of lifting equipment

Any items that do not satisfy the above requirements shall be clearly identified, removed from service and quarantined.

17.12 Lifting Operations

Norsok R-003 shall be used as basis for planning and execution of lifting operations. The necessary lift plans shall be prepared. Lift plans shall include a contingency plan covering unforeseen events during the lifting operation. Risk assessments, HAZID / HAZOP shall be performed. This lift plan must be approved in advance of the lift by the Neptune Energy Representative.

Lifts exceeding 50 tonnes shall be considered as heavy lifts. Heavy lifts should be planned and executed in accordance with DNVGL-ST-N001 Marine operations and marine warranty, supplemented by DNV-RP-H101 Risk Management in Marine and Subsea Operations.

Lifts carried out entirely onboard the vessel shall be controlled by the Contractor's safety management system, and where appropriate under a vessel permit to work. All such lifts shall be carried out outside the safety zone of the installation, drill rig or subsea asset.

Lifts from monohull vessels to monohull vessels are not permitted when working for Neptune Energy. For example, between Contractor's monohull vessels, or between the Installation standby vessel and Contractor's vessel, even with one vessel in the lee of the other. This is to prevent lifts between vessels

that are both moving. In the event that an item needs to be transferred in the field between such monohull vessels, it should firstly be lifted onboard the installation, and then lowered onboard the destination vessel.

Lifting over any subsea assets shall be avoided. Special consideration shall be given pressurized hydrocarbon-carrying systems and other safety critical systems. The planned lift path shall have sufficient clearance to any subsea assets and the evaluation shall be documented and risk assessed.

17.13 Life Saving Appliances (LSA) and Drills

As a minimum all LSA shall be maintained and inspected in accordance with flag state requirements. All drills shall be performed in accordance with flag state requirements. Records shall be maintained and available to Neptune Energy upon request.

17.14 Dumping at Sea

All vessels, barges and offshore Installations either owned or on charter to Neptune Energy are required to comply with the current International Convention for the Prevention of Pollution from Ships (MARPOL) Legislation, and all local Flag State regulations. Adequate arrangements shall be made to segregate and retain wastes safely for onshore collection. Only specified materials can be discharged at sea under controlled conditions.

17.15 Activities and Operations

17.15.1 Safe Access to Vessels

Security arrangements shall comply with the International Ship and Port Security (ISPS) requirements. All vessel and Neptune Energy representatives shall comply with and demonstrate their understanding of the relevant port authority and quayside operator requirements.
The master is responsible for ensuring safe access to and from their vessel.

17.15.2 Personnel Transfer at Sea

Personnel transfer at sea on Neptune Energy chartered vessels is not a routine practice unless it is performed by helicopter, and shall generally be avoided. In special events a requirement to transfer personnel offshore may arise. This may be permitted if other means of transport is not possible or appropriate. Methods for transferring personnel offshore shall be subject to documented risk assessment processes in advance of the activity. Vessel Master and OIM shall approve such activities on location immediately prior to the transfer. Personnel should be suitably briefed and wearing appropriate PPE as identified in the risk assessment in all cases. When deemed necessary, such transfer shall be planned and executed in accordance with NORSOK R-003 and GOMO.

17.15.3 Weather and Environmental Conditions

All marine operations must take into consideration the actual and forecasted weather, in correlation with the defined environmental criteria:

- Wind speed and direction
- Sea state / wave height and direction
- Tidal currents
- Visibility
- Water depth
- Snow and ice
- Heat
- Day / night
- Bright sunlight and glare

Appropriate weather limits and the necessary weather window shall be defined for each operation at the planning stage and included in the risk assessment process. Reference shall be made to the relevant Offshore Installation guidelines or industry guidelines appropriate to the vessel and activity. Masters and OIMs shall be aware or the agreed working limits and ceases all activities prior to exceedance of such limits.

17.15.4 Voyage Planning

The voyage shall be properly planned in accordance with international regulations.
The regulations authorise the Master to take voyage planning decisions for safety or environmental reasons and does not permit the owner, charterers, or Neptune Energy to overrule any such decision.
To reduce emissions, the voyage should be executed at economical speed unless requested otherwise by Neptune Energy.

17.16 Emergency Response

Neptune Energy and vessel operators shall have emergency response procedures in place and contact details which shall be communicated to each other and all relevant parties appropriate to the operation. Search and Rescue has priority over all other operations. Reference is given to section 8.

18. DYNAMIC POSITIONING

18.1 General

Dynamically Positioned (DP) vessels are designed to be capable of maintaining station or moving position, by having their propulsion system and other thrust generation units controlled by a central processing unit.

Vessel Operators of DP vessels shall be aware of the requirements which have been stipulated in this document. Vessel operators shall comply with current regional rules and/or guidance. Vessel Operators shall ensure that DP vessels are manned and operated in accordance with the standards laid down in IMCA M182, 'The Safe Operation of Dynamically Positioned Offshore Supply Vessels' and IMCA M 103 'Guidelines for the design and operation of dynamically positioned vessels', as a minimum.

18.2 Authority and Responsibility

This standard should be used in conjunction with any applicable legislations.
Vessels chartered by Neptune Energy, shall comply with the latest revision of IMCA Guidelines for the Design and Operation of DP Vessels.
Vessel audits shall comply with the guidelines for auditing DP vessels. It is recognized that an older vessel may not comply in all areas of current design criteria.
The IMO guidelines shall always apply. Vessel Operators shall fully appraise all regional rules and/or guidelines when planning operations.
The Operator of the vessel shall clearly define the responsibilities and authority of the crew.

18.3 DP Definitions, Classification and Guidelines

DP vessels shall comply with IMO MSC 645, or IMO MSC 1580 as applicable, both which defines the design criteria for different classes of DP vessel (DP 1, 2 and 3).
Classification societies have specific rules in addition to IMO requirements. IMCA guidelines provide industry best practice. Vessel operators and charterers may have additional requirements.

18.4 Operations

Neptune Energy shall stipulate the minimum DP requirements depending on the type of operation at the vessel selection and on-hire stage. Any deviation from the intended work scope shall be subject to Neptune Energy's management of change process.
The project should define the required operational criteria for the vessel based on, but not limited to:

- Mission critical equipment (gangway, crane, moonpool, risers etc.)
- Capability plots, including normal operation and worst-case failure weather limitations
- Operational level (reference to 18.7 Manning)

Vessels on charter to Neptune Energy shall not operate in DP mode without approval from Neptune Energy or delegate. The vessel's Master shall ensure the OIM is given the opportunity to fully appraise the vessel's capabilities, limitations and approved DP operating criteria.

18.5 Responsibilities

The responsibilities of key personnel shall be identified and defined in the vessel's DP operation manual.

18.6 Operator Training and Competence

DP vessels shall have certified and competent DP Operators, Engineers and Maintenance Technicians for the equipment specific to the vessel. The operator shall have a suitable training and competency system that ensures familiarisation with vessel specific DP systems and comply with *IMCA M117 The Training and Experience of Key Personnel*. Records of DP Drills shall be available upon request from Neptune Energy. All DP personnel must be aware of the actions to be taken as a result of a consequence analysis alarm being displayed on the DP control system.

Masters of DP vessels shall have a minimum of 5 years experience in a relevant senior role.
Chief Officers of DP vessels shall have a minimum of 3 years' relevant experience.
Key DP personnel shall have a minimum of 50 hours assisted DP familiarisation / training if new to the type of vessel or DP system on board. If the training and competence requirements of the vessel's operators cannot be met, a further review of the training and competence of the crew shall be performed, and approved by Neptune Energy.

18.7 Manning

The manning of DP vessels shall be based the Operation Levels in accordance with *GOMO*.

18.7.1 Operation Level A:

Basic operations - Not linked to vessel type Function/Typical Operations

- Operations outside any safety zone
- All response and rescue support.
- Transits (including Towing) in order to do ANY JOB, this level must be met, as this is safe manning (SMC) requirement from Flag State.

Manning: Safe Manning Levels. According to SMC and vessel's safety management system.

18.7.2 Operation Level B:

Standard Operations - Medium Complexity Function/Typical Operations

- Cargo operations within safety zone, including those supported by dual-role stand-by vessels.
- Simple low-load anchor handling operations.
- ROV operations outwith safety zone.
- Towing Operations

Manning Bridge: 2 Fully Certified STCW Officers. If required, winch operator as described in vessel's SMS. If operating on dynamic positioning, bridge manning should consist of one operator certified in accordance with the vessel class notation and a second operator who, as a minimum, has attended the basic DP Induction course. Dependent on the qualifications and previous experience of the second operator, a period of equipment familiarisation in accordance with IMCA, MTS or equivalent recommendations may also be desirable.

Engine: Not in UMS mode (active monitoring). During these operations, all machinery functions are to be actively monitored by the current watch-keeping engineer from a location adjacent to the machinery space so that, should physical intervention be required, the response time for such intervention is minimised.

18.7.3 Operation Level C:

Advanced Operations - High Complexity Function/Typical Operations

- Complex anchor handling operations, typically piggybacking, pre-laying or in deep water
- Close approach/internship operations
- Subsea construction
- Diving support

- Complex ROV operations, near surface assets
- Simultaneous/multi-vessel operations
- Vessel supported lifting operations within the safety zone.

Manning Bridge: Subject to risk assessment, but likely to include: 2 Fully Certified STCW Officers.
If required, winch operator as described in vessel's SMS.
If operating on dynamic positioning two fully certified DPOs one of whom should be a SDPO and the other a DPO in accordance with IMCA, MTS or equivalent requirements.

Engine: Not in UMS mode. During these operations, all machinery functions are to be actively monitored by the current watch-keeping engineer from a location adjacent to the machinery space so that, should physical intervention be required, the response time for such intervention is minimised.

18.7.4 Vessel Competency Matrix

The requirements of Operational Levels A, B and C in relation to bridge and engine room personnel are summarised in the table below.

Manning		Operational Level		
		A	**B**	**C**
Watch Keeping	Bridge	As per Safe Manning and SMS	2 x STCW	
	Engine Room	UMS allowed (if classed)	Not UMS (active monitoring)	
Dynamic Positioning (if used)	Bridge	1 x Restricted DPO	1 x Unlimited DPO 1 x Restricted DPO	2 x Unlimited DPOs
	Engine Room	UMS allowed (if classed)	During DP operations within an installation's safety zone, the engine room shall be manned by a duty engineer.	
Desk (marine) excl. project personnel		As required by the activity	Subject to risk assessment	

Table 18-1: Vessel Competency Matrix

Notes to the table:

1) Unlimited DPO as defined by IMCA, MTS or similar.
2) Restricted DPO to have attended basic DP induction course and had appropriate equipment familiarization.

18.8 DP Class requirements

Note that the following section is not applicable to standby vessels whilst performing Emergency Response and Rescue duties within safety zone. The following table from 'The Activities Regulation' are applicable for all DP operations in the Norwegian sector.

Activity	DP Class
a) Manned underwater operations where loss of position entails a high risk for divers or diver platforms	3

b) Other manned underwater operations where loss of position entails risk for divers or diver platforms	2
c) Support vessels for manned underwater operations conducted from work boats where loss of position for the support vessel has direct consequences for the work boat	2
d) Drilling and well activities where well control is ensured by a facility with dynamic positioning	3
e) Facilities that produce or store hydrocarbons	3
f) Flotels with gangway connected Two reference systems may be accepted for arrival and departure	3
g) Activities carried out by lifting vessels or pipe-laying vessels in the vicinity of the facility (here permanently placed and mobile/floating) It may be acceptable for only two out of three reference systems to be operational upon arrival and departure	3
h) Other activities within the safety zone, where the vessel represents a risk to the facility The requirement applies if the vessel exceeds the vessel size the facility is designed for with regard to withstanding a collision. Two reference systems may be accepted for arrival and departure	2
i 1) Tank vessel loading from facilities handling hydrocarbons i 2) Tank vessel loading from subsea loading and off-loading installations where the tank vessel is not moored or anchored to these installations i 3) Tank vessel loading from subsea loading and off-loading installations where the tank vessel is moored or anchored to these installations	2 2 1* or 2*
j) Loading operations from buoys	1
k) Other well activities The requirement applies to well maintenance facilities if well control is handled by another facility	2
l) Shallow drilling if encountering hydrocarbons is not expected	1

Table 18-2 DP Class Matrix

**Class 1 if the distance between associated facilities and tank vessel is 2.5 km or more, Class 2 if not.*

Notes to the table:

1) For dynamic positioning, consideration should be given to the reference systems' limitations as regards reliability, availability and quality.
2) High risk as mentioned in row a), means the cases when the diver does not have an un-restricted return to the diving bell, or where loss of the vessel's position can lead to loss of or damage to the diving bell, and possibly the associated bottom weight.
3) The requirement relating to Equipment Class 3 for drilling and well activities as mentioned in row d), does not apply to shallow drilling and core drilling. For shallow drilling, however, other requirements in the table may be relevant, such as the requirement relating to Equipment Class 2 for other activities within the safety zone without risk to health, environment and safety. Well activities that require Equipment Class 3, included well intervention, such as wireline operations. Other well activities as mentioned in row l), with requirements for Equipment Class 2, where the production facility has well control equipment, may be well stimulations and unmanned underwater operations, including the use of remote-controlled sub-sea vessels or subsea tools.
4) The recommendation for Equipment Class 2 for tank vessels as mentioned in this table, is conditional upon the preparation of a positioning capacity plot for the dynamic positioning system.

18.9 Failure Modes and Effects Analysis (FMEA)

The vessel operator shall provide FMEA documentation for DP2 and DP3 vessels identifying the worst-case failures and trials documentation that verifies this. Upon alteration of the vessel/equipment

involving DP capabilities, redundancy and or performance, the FMEA shall be revised. The revision of the FMEA shall have been updated at least every fifth year. The FMEA shall have been developed in accordance with *IMCA M166 Guidance on Failure Modes and Effects Analyses*.
The FMEA proving trials report shall be revisited minimum every five years. In addition, compliance with IMO Guidelines requires survey and testing after defects are discovered and corrected, after a DP related accident, upon reactivation after cold stacking, or whenever significant repairs or alterations are carried out, to demonstrate full compliance with applicable parts of the guidelines.

18.10 Vessel DP Trials and DP Setup

DP vessels shall be configured for Critical Activity Mode (CAM) or Task Appropriate Mode (TAM) as required by Neptune Energy for each DP operation (activity) to be undertaken.
Checklist used for DP setup should be of such format ensuring DP setup follows defined DP Class and mode of operation, e.g. Open or Closed bus-tie. This means that checklist should not only "log" setup used but should provide sufficient guidance ensuring setup is in line with guidance (CAM, TAM, ASOG etc.), DP FMEA and anticipated operations. This means that status for minimum running DGs, thrusters, powering of changeable thrusters/equipment, SWBD bus-ties, Isolation valves, redundancy links, etc. is clearly defined.

<u>Power system setup:</u>

- In the case of activities requiring Critical Activity Mode, the DP system shall be configured as two or more independent power and propulsion systems each capable of maintaining position and heading either alone or in combination with other independent groups which remain fully operational following the defined worst case failure. For propulsion systems based in full or in part on electric power generation and propulsion, all bus-ties between independent power systems will be in the open position.
- The vessel's DP system FMEA will have proved the DP system is single fault tolerant in respect of the failure criteria defined for the assigned IMO DP equipment class (IMO MSC 645 and 1580) and assigned DP class notation.
- The DP system FMEA will have proved the DP system is single fault tolerant in the independent power system configuration (bus-ties open) in addition to any other configuration.
- Neptune Energy may require the vessel owner to seek class approval for configuration changes where review of the DP system FMEA indicates that identified risks are not adequately addressed.
- The power system configuration for Task Appropriate Mode is to be approved by Neptune Energy. The use of TAM will be justified based on suitable and sufficient risk assessment process undertaken.

- Consideration should be taken to isolate all cross connections between the redundant DP equipment groups while in Critical Activity Mode configuration – (Circuit breakers for back-up or dual supplies will be open, crossover valves will be closed and auto-changeovers will be locked such that it is not possible to create a cross connection or propagate a failure effect between redundant DP equipment groups).
- A power system configuration for Task Appropriate Mode based on closed bus-ties may be approved on a case-by-case basis. A prerequisite for approving closed bus-ties configuration will be a class approved DP system FMEA covering the closed bus-ties configuration however the existence of such an approved document may not be sufficient on its own.
- The DP System FMEA for closed bus-ties shall include, but is not limited to proof that the power and propulsion plant is single fault tolerant in respect of a comprehensive range of failure modes including (but not limited to):
    - Over and under voltage (loss of sensing)
    - Over and under frequency
    - Short circuit, open circuit, earth fault at all points in the power generation and distribution system
    - Generator over and under excitation (reactive power imbalance and instability)
    - Generator over and under fuelling (active power imbalance and instability)
    - Crash synchronisation of generators and/or power systems
    - Inadvertent connection of a stopped generator
    - Connection of a load without pre-charge or pre-magnetisation
    - Power regeneration from loads with regenerative capability
- IMCA Annual DP Trials shall be carried in a manner that satisfies IMCA M190 and IMO (MSC 645 and 1580) requirements for annual DP trials.
- DP setup should reflect required redundancy for the planned operations for Neptune Energy.
- The test programme shall demonstrate appropriate levels of redundancy, protection, detection, and performance, as described in IMCA M190 for each subsystem in the DP system.
- The annual DP trials will prove the conclusions of the FMEA in respect of single failures and include tests to prove that the vessel will not blackout (and position and heading can be maintained) at the limit of the vessel's post failure DP capability in all defined and agreed configurations. In particular:
    - Acceptance of load by remaining power plant after worst case loss of power generating capacity without associated loss of load e.g. loss of a single or multiple engines/generator failure (trials should demonstrate 100% power and thruster performance).
    - Any sensor or transducer fault (including status circuit breaker status) for power management functionality (FMEA should demonstrate independence of PMS for each redundant DP equipment group).

- When only one bus-tie breaker is provided between redundant power systems (or multiple bus-ties are in master/slave configuration) it should be proven that any fault in the single or master bus tie breaker and its control system (e.g. unscheduled closure or flashover) cannot black out the vessel.

All DP vessels shall have been subjected to a comprehensive testing and trials procedure. Copies of the latest trials report shall be kept on board. The DP trials document will have been developed in accordance with *IMCA M190 - Guidance for developing and conducting annual DP trials programmes for DP vessels*.

All chartered DP vessels shall have an Annual or Proving DP Trials report on board which shall have been completed within one year.

Note! Remote verification is not considered to be in line with IMCA M190 and will not be considered as an acceptable trials method for Annual DP Trials.

18.11 Operations Manual

DP vessels shall have a DP Operations Manual specific to the vessel. It shall cover all the work for which the vessel is designed or likely to be used for. This document shall comply with IMCA M103 and IMCA M109.

18.12 System Failure

Any DP vessel that suffers a critical failure or fault in the DP system and its sub-systems must immediately take the appropriate action. The vessel must immediately cease DP operations and move the vessel to a safe location. The Master shall inform all relevant parties of the problem. Prior to recommencing operations, they shall satisfactorily complete full DP system setup test. Acceptance to recommencing DP operations after system failure shall be given by OIM. See 10.1 Incident Response.

18.13 DP Incidents

DP Incidents shall be recorded and reported in accordance with IMCA DP Station Keeping Event Report Form and retained for a minimum of 5 years. All corrective actions shall be recorded.

18.14 Position References

There must be a minimum of three independent reference systems where two shall be of a different principal. There can be exemptions for this as per outlined in Table 18-2 DP Class Matrix or as per IMCA M103. A dual DGNSS does not constitute two separate systems.

Use of relative position reference should be evaluated prior to be used against a moving target.

The suitability of the position reference systems shall be subject to risk assessment.

Temporary position reference systems may be used if Customer Acceptance Test (CAT), performance test, and failure analysis towards the initial installation has been performed by recognised third-party company. Selection of position references should be in such way that a single failure like loss of UPS do not cause all position references in use lost.

18.15 Sensors

Use of sensors should meet minimum requirements of defined operational DP class as outlined in IMO 645/1580 and class requirements. Selection of sensors should be in such way that a single failure like loss of UPS do not cause all sensors in use lost.

19. PLATFORM SUPPLY VESSELS (PSV)

This section applies to any offshore vessels performing deck or bulk cargo transfers with a Neptune Energy offshore installation or vessel. This includes but is not limited to PSVs, MPSVs and AHTSs undertaking cargo operations.

19.1 General

Cargo handling between supply vessels, offshore installations and quayside facilities shall be carried out in accordance with latest revision of GOMO and NOROG Guidelines 091.
Any cargo or operations that do not comply with the guidelines and best practice should be rejected reported to the relevant installation, quayside facility and Neptune Energy.
All cargoes carried to and from an installation shall be accompanied by a manifest, identifying the goods in transit, including details regarding size, weight, content, and destination. Special attention should be given to heavy lifts. Dangerous goods will be marked in accordance with current statutory and regulatory requirements and shall be stowed in accordance with the International Maritime Dangerous Goods (IMDG) Code.

19.2 Propulsion

Any vessel engaged in supply operations shall have DP Class 2 notation. All propulsion and thrusters must be fully operational when alongside an offshore installation and operating on 45% available power or less. One person on the bridge shall be capable of controlling all propulsion units. The vessel shall be capable of 10 knots ahead minimum.
Operations on windward/drift-on side of a Neptune installation and bulk operations with bulk cargo containing “marine pollutants” shall be carried out with open bus-tie configuration. Vessels with ice class (DNV ICE-C or equivalent) and/or X-bow type bow, shall in addition operate in according to Critical Activity Mode (CAM).

Changing between open/closed bus-tie operation should be performed outside the safety zone or in a drift off position.

19.3 Manning

Vessels shall be manned with qualified and experienced personnel to enable 24-hour cargo activities. Reference is made to Section 18.7 for manning in DP Operations.

19.4 Specific Requirements

Upon arrival at installation after transit, field arrival checks shall be carried out. Such checks should include testing of manual levers, independent joystick and setting vessel up for DP operations.

20. STANDBY VESSELS

This section applies to any offshore support vessels undertaking emergency response, rescue or standby duties at a Neptune Energy offshore installation.

20.1 General

The standby vessel shall be compliant to national regulatory requirements and guidelines. The primary role of the standby vessel is to:

- Respond to installation emergencies
- Provide routine and emergency support for helicopter operations
- Provide routine and emergency support for over side work including man overboard
- Rescue persons from the water and provide medical aid
- Act as On-scene Co-ordinator in the event of an emergency
- Act as a reserve radio station
- Monitor passing vessels and communicate any potential collision situation including unauthorised entry into the safety zone
- Assistance with oil spill response
- Provide fire fighting support if needed

As a secondary function, Standby vessel may be also engaged to perform annual inspection scope of the subsea assets while it maintains the standby vessel function.
Standby vessels may be requested to check and confirm the positions on any surface buoys in the field. If a buoy is found to be out of position or at drift, or a navigation mark or light is missing, it is to be reported through the proper lines of communication.
If the standby vessel is providing any secondary function or involved in any operation other than its primary support, the state of readiness and response time shall not be compromised in any way.

20.2 Propulsion

Vessel performing the standby vessel function shall have DP Class 2 notation.

20.3 Manning

Vessels shall be manned with qualified and experienced personnel to enable 24-hour response. Manning on board standby vessels shall be at a level that ensures that tasks described in the contract are delivered effectively. Personnel shall be competent and experienced in any secondary activity undertaken.

20.4 Specific Requirements

20.4.1 Contingency Planning

Neptune Energy shall provide standby vessels in accordance with the Emergency Response Plan (ERP). The vessel operator shall prepare written procedures covering the response of the standby vessel in the event of an incident.

20.4.2 Capabilities

The vessel's performance, capabilities and capacity shall be known, verified, and validated. This includes number of Rescue Craft, mechanical means of rescue, survivor capacity, bollard pull capability, and pollution response capability.

20.4.3 Training and Exercises

All Term Chartered Vessels contracted to provide Emergency Response and Rescue duties shall as a minimum conduct:

- Annual independently witnessed trials per crew
- Monthly self-initiated trials (unwitnessed) that, as a minimum, include the use of Rescue Craft and Mechanical Means of Rescue.
- Quarterly Personal Locator Beacon (PLB) trials (2 per crew, per annum)
- Bi-annual night-time trials per crew (Conducted prior to daybreak for safety reasons)
- Vessels equipped with oil spill response/dispersant spraying equipment, shall undertake a minimum of one exercise per month deploying dispersant spraying booms to test their function with water.

All spot hire or ad-hoc chartered vessels shall also meet the criteria described above. There is an expectation that a PLB trial will have been completed within the preceding 12 months.

20.5 Communications

The normal method of communication will be on VHF channels as designated by the installation. Radio checks with the installation shall be made at frequent intervals and logged. The frequency of such checks should be increased during heavy weather. Distress frequencies will be used only for initial calling or in an emergency.

20.5.1 Helicopter Communications

Helicopter communications and homing/tracking equipment shall be available on the standby vessel for the following purposes:

- Enable the standby vessel to locate a ditched helicopter by homing onto the emergency locator beacon
- Search and rescue communication concerning aeronautical emergencies
- Standby vessel/helicopter communications concerning the safety of life

20.6 Pollution Control Equipment

Pollution control dispersant spraying equipment is carried on vessels where there is a requirement under the relevant Oil Pollution Emergency Plan (OPEP). Neptune Energy's OPEPs shall be provided and carried on board all standby vessels.

Pollution spray equipment is to be tested with water only on a monthly basis.

20.7 Collision Risk Management

The standby vessel shall be responsible for monitoring all passing, disabled or drifting vessels utilising radar and AIS, and ensure that the risk of ship collision is always minimised. Additionally, a radar early warning system (REWS) may be used to alert both the standby vessel and the installation. Clear instructions for monitoring safety zones, and actions required by the standby vessel, shall be included in the Offshore Installation Emergency Response Plan and in the associated standby vessel procedures.

21. IMR AND CONSTRUCTION VESSELS

This section applies to any vessels undertaking IMR or construction work at a Neptune Energy Offshore Installation, including but not limited to IMRs, MPSVs, PSVs and AHTSs undertaking IMR or construction operations.

21.1 Operational requirements

Within the safety zone

Safe working limits shall be based on the vessel's station keeping capability and the location of any structures or asset in the proximity of the worksite. This shall be agreed between the vessel operator and Neptune Energy during the planning phase. Safe working limits shall be documented in task specific procedures and or vessel operations manuals.

See chapter 18 Dynamic Positioning.

Within a 2000m radius of the installation, outside safety zone

Redundant propulsion/thrusters are not required for ROV and survey work where loss of position does not represent a hazard to personnel or assets.

The minimum position control requirement is a single automatic control system with a joystick.

If the activity requires passing within 200m of a subsea structure while the vessel operates on automatic control, the system shall not be capable of changing course or direction suddenly, without alarm. It is essential that propulsion and thrusters can be stopped and/or reversed immediately to prevent collision.

For Offshore Construction vessels, all operational criteria and limitations shall be identified as part of HIRA and HAZID/HAZOP and adequately addressed in the Contractor's marine operations manual.

Operating Limits

Operating limits for ROV / Construction vessels working near installations shall be assessed for each vessel individually and agreed with Neptune Energy and the OIM. The assessment will consider the vessel's thruster configuration, manoeuvrability, redundancy of power, weather limitations, DP capability, reference systems characteristics, duration of the operation and the possibility to abandon the site. The size and displacement of the vessel compared to installation's impact resistance shall be considered.

21.2 Planning and Communications

Planning, communication and co-ordination of ROV and Construction vessel operations is required to avoid conflict with other activities. Marine activity coordination and SIMOPS evaluations shall performed in accordance with Neptune Energy management system. Reference is given to section 13 Third Party Operations and SIMOPS.

The main steps of a subsea project planning and execution is summarised below:

- Subsea Request Call-off
- Prepare for execution
- Engineering follow-up and interfaces
- Equipment/tools mobilisation
- Vessel mobilisation and inspection
- Offshore execution
- Vessel demobilisation
- Equipment and tools demobilisation
- Close out

21.3 ROV launch and recovery

The ROV Vessel shall have procedures for the launch, recovery and operation of the ROV including measures in place to minimize the risk of entanglement of the ROV tether with vessel thrusters and any nearby structures or hazards.

21.4 Offshore crane system operations

Any offshore lifting operations at Neptune Energy assets shall be in compliance with Company standards for management of lifting operations and lifting equipment.
The Offshore Construction vessel shall have procedures for use of offshore crane system in place. Cranes and other lifting equipment on the vessels must be in a fully functional condition, and operate safely. A project specific lift plan shall be developed for the proposed lifting operation. It`s preferred that the vessel has a valid Crane FMEA for their lifting system, and a valid Ballast FMEA for the heeling system.

21.5 Propulsion

Any vessel engaged in ROV/Construction operations shall have fully redundant (duplicate) means of main propulsion and thrusters used for station keeping as outlined in section 18 Dynamic Positioning in this manual.

21.6 Manning

Vessels shall be manned with suitably qualified and experienced personnel to enable 24-hour operation activities. Reference is made to Section 18.7 for manning in different operations.

22. ANCHOR HANDLING VESSELS, TOWING & MOU MOVE OPERATIONS

22.1 General

This section applies to any vessels undertaking anchor handling, towing and MOU move operations. Mobile Offshore Units (MOUs) includes Semi-submersibles, Jack-up Drilling Rigs, Flotels, accommodation units and any multi anchored vessel. This section does not apply to emergency towing or to tanker assist operations.

22.2 Manning

The crew of any contracted vessel to undertake anchor handling / towing activities must be sufficient to support continuous operations with the personnel deployed. Reference is made to Section 18.7.
In addition, the following requirement shall be met:

- Bridge – in addition to ship-handler and communications officer, the vessel shall be manned by a qualified winch operator. Winch Operator shall have sufficient knowledge about the winch, safety systems including emergency stop and release, functions and limitations.
- Deck - 2 persons available to support deck work at all times
- The vessel operator shall have a training and competence assurance system in place for all anchor handling duties.
- In the event a vessel is operating in DP mode, manning shall be in accordance with the DP Manning outlined in Section 18.7.

22.3 Training and Competence of MOU Move Personnel

All MOUs shall be manned with sufficient personnel to enable 24-hour MOU move operation. The MOU move personnel must be aware of the actions to be taken as a result of an emergency during towing and anchor handling operations offshore.
Tow Master should have a minimum of 3 years of experience with the relevant MOU type.
Marine Representative should have a minimum of 1 year of experience with the relevant MOU type.
Less experienced Tow Masters and Marine Representatives may be considered on a case-by-case basis particular to the intended operation. Relevant installation personnel shall be aware vessels' operational capabilities and limitations.

22.4 Procedures

The following procedures are in addition to GOMO and national requirements. Procedures for a proposed MOU move shall be developed by or on behalf of the MOU owner or operator and shall be submitted to Neptune Energy for approval. Details of vessels, anchor patterns, clearly outlined duties and requirements for each involved vessel, stability calculations, preload calculations, and roles and responsibilities of key personnel must be included.
Vessels chartered for MOU moves may also require the approval of the MOU operator.

Company Representative(s) must be appointed and be in attendance on board for the period of the activity..

22.5 Acceptance of anchor patterns

At least 3 weeks prior to commencement of the work, the proposed anchor pattern drawings must be submitted to Neptune Energy for approval.

Anchor pattern drawings shall give details of:

- Position and type of anchors
  - Main anchors - Number, type, weight in air and water.
  - Back-up Anchors - Number, type, weight in air and water.
- Categories of wires or chains
  - Mooring Wires/Chains - Number, conditions, age, individual lengths, size and weight in air and water.
- Pennants - number, individual lengths, size and weight in air and water.
- Buoys - Type, material and buoyancy.
- Towing Bridles - Position, size and make-up.
- Heights of lower fairleads above or below water surface at operating draught.
- All above details should include:
  - Spare equipment carried.
  - Clearly outlined procedures for the deployment and recovery of anchors including anchor deployment sequence and vessel designation
- Vessels will not be permitted to lay anchor patterns or deploy moorings until the proposals have been considered and approval has been given by Neptune Energy.

22.6 Anchor Handling and Moorings Positioning

Anchors shall be laid as far as possible from subsea assets, and normally not closer than 200 m of any subsea asset. By exception, this may be reduced to 100 m if subject to risk assessment and the necessary mitigation measures in place. The anchor line tension shall not be pointing towards the asset. Vessel(s) shall be at least 50 m horizontally clear of subsea assets before lowering, decking, and/or transferring anchors. Anchors shall be decked and secured inboard of the towing pins, double secured and/or disconnected whenever crossing pipelines or subsea assets.

22.7 Catenary curves

Curves for the appropriate water depth, covering the full range of working tensions, shall be supplied showing normal operating tension range and maximum mechanically induced tension for pre-tensioning purposes.

22.8 Moorings pre-lay operation

The mooring pre-lay operation shall be undertaken according to pre-lay procedures and as per Neptune Energy approved anchor pattern. All requirement for the MOU move operation are applicable to mooring pre-lay operation.

22.9 Testing of mooring

Before a mobile unit is accepted as safely moored all anchors will be satisfactorily cross tensioned as agreed with Neptune Energy Company Representative (CR). If the cross tensioning indicates an anchor may have dragged, its location must be accurately determined, and re-laid if necessary. Tension test should be done according to MOU operational procedures and shall satisfy the mooring analysis requirements.

23. APPENDICES

23.1 Appendix A Marine Operations within Gjøa Safety Zone

Marine Operations within Gjøa Safety Zone

The Safety Zone for the Gjøa semi area extends 500m from the riser touch down points and also 500m from the semi including excursion zone. In effect this means that the safety zone area is significantly larger than 500m. The safety zone is specified in document C097-GJO-A-RF-0017 Gjøa A Semi – Field layout. The document can be obtain at GOMO and Offshore Norge, Norwegian Guidelines, Neptune Energy.

Contractor's vessels may not enter or commence work within the Gjøa Semi safety zone without permission from the Gjøa OIM.

Vessels shall not enter the Gjøa Safety Zone prior to completion of the checklist for entering. The checklist is available at GOMO and Offshore Norge, Norwegian Guidelines, Neptune Energy.

On completion of DP checklist and before approaching Gjøa, the vessel shall plot its drift for a short period without using power to maintain station – i.e. simulating loss of powered station keeping. A drift plot print (e.g. screen grab from the positioning display) showing the resultant drift trail clearly shall be submitted to the Neptune Energy representative – this shall be forwarded to Gjøa CCR and Deck & Marine Manager before the vessel is given permission to commence work. If required, Gjøa Standby vessel can be used to continuously monitor drift conditions.

The duration of marine operations inside the Gjøa Safety zone shall not be longer than necessary, and the work shall be carefully planned to ensure effective operations. The weather forecast shall be regular evaluated with respect to the planned operations and defined weather criteria.

The platform hull structure can withstand approximately 28MJ of vessel head-on/bow collision. The vessel bow shall under no circumstance be pointing towards the platform structure, power cable, or risers during operations.

Subsea operations at the Gjøa field shall be performed in accordance with MSD-OANO-OD-05 Gjøa Subsea Operations Manual

It is important to understand the 'Subsea Operations Caution Zone' outlined in the drawing – this shows the limits of the area in which the risers and mooring lines are lifted off seabed into the water column. Extreme care must be taken in this area regarding the relative position of the subsea assets,

the ROV, its TMS, and also any vessel deployed crane or down line cables/hoses. Within the Caution Zone the direction of drift created by all forces acting on the vessel shall be considered, from this the vessel shall always be positioned such that it will drift clear without any vessel deployed equipment coming into contact with Gjøa production assets in the water column or entering the Red Zones in the event of a loss of position keeping. This shall also be considered for the vessel route when exiting the Safety Zone.

Task plans shall take this into account and include approved vessel positions for the operation, define the operational depth(s), and specify the methods to be employed to positively mark the actual positions and depths of the closest components which the deployed equipment has the potential to come into contact with. These task plans shall be reviewed prior to work commencing by the Gjøa OIM or Deck & Marine Manager as part of the work permit application. In practice this will likely mean that the first operation is for the vehicle to plot headings and depths of particular risers and moorings in the water column of the intended work area before the vessel moves into position or changes position.

For all operations with the vessel located to the North and South of Gjøa, the vessel may work in drift on conditions provided points 1 – 7 below is fulfilled. This also apply to platform supply vessel operations.

1. Sea state does not exceed 3m Hs
2. Wind remains below 25kts
3. Good visibility
4. The vessel bow or stern heading shall not be pointing towards power cable and risers
5. The vessel position shall be such that in the event of loss of position it cannot move into either East or West 'Red' zones.
6. Documentation of “drift on” or “drift off” shall be available.

Operations within Riser and Power Cable Red Zones shall be subject to full HAZOP prior to operations and appropriate work permit shall be in place. Further, operations inside the Red Zones shall not be conducted in a blow on/drift on situation and project specific weather criteria shall be established during engineering and subject to HAZOP.

When vessel is approaching 50m outside risers, power cable, or moorings ROV TMS position shall be maintained at a minimum of 20m directly behind the ROV, and minimum 20m above the ROV at all times. At the HOG bend of the riser, the ROV TMS shall be 20m above the shallowest riser HOG bend and shall not descend below this level as the vehicle moves down the SAG bend closer to the Semi. This is to ensure TMS cannot contact risers or mooring cables as the ROV and vessel move. An illustration of the above details can be found in the appendix. The TMS position relative to the ROV shall be continuously monitored by the ROV supervisor and DPO by means of a dedicated transponder. If this condition cannot be maintained for any reason operations shall not proceed.

The detailed requirements for marine operations within the Gjøa Safety zone are summarized in the table below.

Requirements for Vessel Operation in Gjøa Safety Zone, Subsea Caution Zone, North and South sides, Riser and Power Cable Red Zones						
	Level 1 WP	**Position of adjacent components plotted**	**Shut down Production and depressurize HC risers**	**Blow/Drift Off Condition**	**Neither vessel bow or stern pointing towards risers or power cable**	**CCR Informed of performed activity**
Vessel in Safety Zone	**X**					**X**
Vessel in Subsea Caution Zone	**X**	**X**		**X** [1)]	**X**	**X**
Vessel in North or South side of Gjøa	**X**	**X** (moorings)			**X**	**X**
Vessel in Red Zone of risers – East side	**X**	**X**	**X**	**X**	**X**	**X**
Vessel in Red Zone of risers & power cable – West side	**X**	**X**	**X** [2)]	**X**	**X**	**X**

[1)] Blow/drift-off condition requirement in Caution Zone is to ensure the vessel position in such way it cannot enter the RED zone

[2)] Requires shut-down of Vega Production and depressurisation of Vega riser

If loss of control occurs on vessel, CCR shall be informed immediately. CCR will then act in accordance to relevant DFU.

Lifting operations

All lifting operations over open sea or subsea should be in compliance with NORSOK R-003.

Lifts carried out entirely onboard the vessel shall be controlled by the Contractor's safety management system, and where appropriate under a vessel permit to work. All such lifts shall be carried out outside the Gjøa Semi safety zone, and at least 100m* distance horizontally from any Gjøa subsea assets.

The Contractor shall prepare and follow a lift plan in advance of all subsea lifts. This lift plan must be approved in advance of the lift by the on-shift Neptune Energy Representative.
Subsea lifts could typically include the raising or lowering of template choke bridge modules, or subsea tools requiring guide wire assistance, as well as opening or closing of panels or hatches in subsea structures.

The launching and recovery of ROVs does not require lift plans.

Lifts of most heavy items (e.g. choke bridge modules) to or from templates or satellite well F are expected to be carried out using a tower and multi guide wire system through the moonpool of the intervention vessel. Also when the item is on the vessel, it must be restrained in a heavy lift/module handling system. The overboarding or recovery onboard of such items with the load simply hung below a crane should be avoided and only undertaken after careful formal risk assessment has taken place.

Where an item must be lowered to the seabed; but the use of a tower and / or guide wires is not appropriate or not possible, the vessel shall initially lower the item to within approximately 20m above the seabed (or a safe height bearing in mind adjacent seabed structures) at a safe sideways distance (normally 100m)*, and down current from the nearest subsea asset. When the item is at this depth, the vessel and load can be moved to their final location. Recovery of such items to the surface shall be carried out in a similar manner but in reverse.

(*The safe distance of 100m has been arrived at assuming a water depth of 370m and a dropped object drifting sideways at an angle of 15 degrees as it falls to the seabed. However, common sense should always be applied in such situations, e.g. lifts between two pipelines may lead to an unnecessary large offset for the vessel and potentially impose a larger risk due to towing the load over a long distance).
Where an item is lowered to the seabed with the use of a tower and guide wires, the vessel shall offset 50m down current from the structure for the initial deployment phase of the lift, and with minimal tension in the guide wires, then as the load reaches 20m above the seabed, step into position in controlled increments while increasing tension in the guide wires for the final approach to landing. Retrieval of equipment should also be done this way but in the reverse order.

Neptune Energy only permit certain vessel to vessel lifts offshore, and then only when local conditions permit.

Lifts involving items within DNV approved containers and baskets are permitted between the Gjøa Semi and Contractor's vessels and vice versa.

Lifts from monohull vessels to monohull vessels are not permitted in the Gjøa field: for example, between Contractor's monohull vessels, or between the Gjøa standby vessel and a Contractor's vessel, even with one vessel in the lee of the other. This is to prevent a lift between vessels that are both moving.

In the event that an item needs to be transferred in the field between such monohull vessels, it should firstly be lifted onboard the Gjøa Semi, and then lowered onboard the destination vessel. Lifts involving items within Neptune Energy approved containers and baskets shall be permitted between Contractor's vessels if one vessel is a monohull and the other is a barge or multihull vessel larger and more stable than the monohull, and if the Offshore Neptune Energy Representatives and the Gjøa Semi OIM approve the lift.

Any vessel to vessel lifts that are necessary but cannot meet the above requirements must be carried out either in port or in sheltered water close inshore.

23.2 Appendix B Requirements for ERRV / standby vessel availability at the Gjøa field

23.2.1 General

Reference is given to Synergi #39989 ERRV Availability - Risk Assessment. On a regular basis the Gjøa standby vessel needs to leave the field for shorter durations to perform crew changes. The vessel may also need to leave the field for maintenance work, to perform platform supply services or to attend regulatory classification activities. In future the standby vessel may also be part of an area preparedness agreement with Equinor and upon request the vessel may need to leave the Gjøa field to provide services for Equinor. This appendix defines the requirements to availability of an Emergency Response and Rescue Vessel (ERRV) at the Gjøa field.

23.2.2 Primary functions of the ERRV and performance requirements

The ERRV must be prepared to assist the Gjøa platform in every situation that may occur. The main tasks of the ERRV is to support the platform in the Defined Situations of Hazard and Accident (DSHA) in accordance with the emergence preparedness plan: *MSD-OANO-OA-05-00005 - Neptune Energy Beredskapsplan Gjøa semi.* The main tasks of the ERRV is listed in the table below. In the event that the ERRV is not located at the Gjøa field this should be compensated by implementation of the safeguards listed in the table.

ERRV function	Performance requirement	Safeguard
DSHA Man overboard • Rescue of man overboard • One scene commander	Ref. NOG 064: 8 min response time for rescue of personnel.	Work above sea is controlled by PTW system. No work above sea shall be performed without a MOB boat with crew on standby.
DSHA Evacuation, personnel in sea • Rescue of personnel from sea / personnel evacuated to sea	Ref. NOG 064: 120 min response time. Rescue of 5% of the POB.	This performance requirement is met by the SAR on standby service.
DSHA Fire and Explosion • Assist with FiFi equipment and cool down exposed structure	No requirement. Platform FiFi systems is sufficient. Critical systems are protected by Passive Fire protection	The performance requirements are met by the platform FiFi and PFP systems.
DSHA Oil Spill • Oil spill management, monitor, verify and response. • On scene commander during acute pollution situations until relieved by NOFO personnel.	Ref. MSD-OANO-EA-10- 00001 Beredskapsplan mot akutt oljeforurensning PL153 Gjøa-feltet. System 1, Oil Recovery (OR) vessel shall be available at the field within 6 hours.	An OR vessel with NOFO system onboard in position capable to serve the Gjøa field within 6 hours.

DSHA Vessel on collision course: • Monitor and enforce the safety zone. • Monitor, alert and if possible, intercept vessel or drifting objects on collision course	Ref. NOG 064: Notification time for vessel on collision course: 50 min. Drifting vessel / object detection: Small vessel: 12 n.m Large vessel / installation: 20 n.m	A vessel with towing capacities in position capable to serve the Gjøa field within 5 hours.