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## Revision History

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<th>Date</th>
<th>Section</th>
<th>Changes</th>
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<tr>
<td>1</td>
<td>Sept – 2018</td>
<td>11.1 - Introduction</td>
<td>Chapter 11 content wording updated</td>
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<tr>
<td></td>
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<td>11.1.1 – Definitions and Abbreviations</td>
<td>Change to heading and content, various definitions and abbreviations from previous revision moved into this table</td>
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<td>11.2 – Jointly Agreed Procedures and</td>
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<td>11.2.6 – Offshore Marine Representative</td>
<td>New role and content added</td>
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<td>11.2.7 – ROV Supervisor</td>
<td>New role and content added</td>
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<td>11.2.8 – Equipment Supplier</td>
<td>New role and content added</td>
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<td>11.2.9 – Survey and Positioning Supplier</td>
<td>New role and content added</td>
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<td>11.3 – Preparations</td>
<td>Reference to “Appendix 11-A” removed as the suggested works specification contents is now included at 11.3.1</td>
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<td>11.3.1 – Contents of Work Specification</td>
<td>Content updated in relation to above change</td>
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<td></td>
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<td>Guidance on Cross Track Distances</td>
<td>Section 11.3.1.2 from previous revision removed as this is now outdated. Stability calculations for worst case are now valid for entire operation</td>
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<td>11.3.2 – Pre-Operation Meeting Onshore</td>
<td>Content updated</td>
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<td>11.3.3 – Vessel Preparations</td>
<td>Change in heading and sub-sections</td>
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<td>11.3.4 – MOU Preparations</td>
<td>New section added similar to Vessel Preparations</td>
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<td>11.4 – The Execution Phase</td>
<td>Major change: Section 11.4 and 11.6 from the previous revision have been merged into one section. Sub-sections from previous revision have been moved into new 11.4 section and content has been updated. The reason is to reflect how the planning, preparation and execution phase for, to and of the offshore operation is actually done today. Pre-lay operation has been added as sub-section due to the increased amount of such operations. Anchor and anchor lines recovery has been moved and updated as separate sub section since this is part of the Anchor handling operation. Content and drawing updated</td>
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<td>11.5 – Marine Operations - Tow</td>
<td>Major change: Taking into consideration the findings from the Transocean Winner incident report, the content of this section has been significant changed.</td>
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<td>11.6 – Heading Control Operations</td>
<td>Major change: Previous section moved to 11.4 and new section on Heading Control added</td>
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<td>11.7 – Communications</td>
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<td>11.8 – Vessel Stability</td>
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<td>11.9 – Guidance on the Bollard Pull and</td>
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<td>Vessel Working Limits</td>
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<td>11.10 – Winch Operation: Emergency Release</td>
<td>Change of heading and update of content</td>
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<td>and Emergency Stop</td>
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<td>11.11.1 – Considerations for Deeper Water</td>
<td>Updated content</td>
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<td>Breaking Out of Anchors</td>
<td>Section 11.11.12 from previous revision moved to 11.4</td>
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<td></td>
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<td>11.12 – Reference of Best Practice</td>
<td>New section added</td>
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11 Anchor Handling & MOU Moving

11.1 Introduction

Anchor handling and MOU Moving operations are among the most difficult and demanding operations in the offshore industry. High tensions, combined with heavy equipment, requires good planning, close attention during operation, good communication and qualified and trained personnel to carry out the various types of anchor handling operations.

All personnel should appreciate their joint responsibilities as defined in Section 11.2 below.

Safety of crew, Environment, MOU and vessel is paramount.
The guidance in this section applies equally to all types of MOUs.

11.1.1 Definitions and Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AH</td>
<td>Anchor Handling</td>
</tr>
<tr>
<td>AHV</td>
<td>Anchor Handling Vessel</td>
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<tr>
<td>COLREGS</td>
<td>Convention on the International Regulations for Preventing Collisions at Sea</td>
</tr>
<tr>
<td>DP</td>
<td>Dynamic Positioning</td>
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<tr>
<td>Towing-gog</td>
<td>A fixed block or chock located in the centre of a tug-vessel where the towing wire runs through.</td>
</tr>
<tr>
<td>HIRA</td>
<td>Hazard Identification &amp; Risk Assessment</td>
</tr>
<tr>
<td>HSE</td>
<td>Health, Safety and Environment</td>
</tr>
<tr>
<td>MBL</td>
<td>Minimum Breaking Load</td>
</tr>
<tr>
<td>MOC</td>
<td>Management Of Change</td>
</tr>
<tr>
<td>MODU</td>
<td>Mobile Offshore Drilling Units</td>
</tr>
<tr>
<td>MOU</td>
<td>Mobile Offshore unit. Includes but are not limited to all types of MODU, FPSO, Barges, Accommodation Units, Jack-ups and other types of self-elevating units.</td>
</tr>
<tr>
<td>OIM</td>
<td>Offshore Installation Manager</td>
</tr>
<tr>
<td>Operating Company</td>
<td>In the context of this Chapter, Operating Company means the company that has overall responsibility for the operation, and acting as</td>
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</table>
charterer of the MOU subject for the operation.

<table>
<thead>
<tr>
<th>R/M</th>
<th>Risk Management</th>
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<td></td>
<td>Is the identification, evaluation, and prioritization of risk followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events.</td>
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</table>

<table>
<thead>
<tr>
<th>ROV</th>
<th>Remote Operated Vehicle</th>
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<tr>
<td></td>
<td>In this context, referring to an underwater remotely operated vehicle (ROV) designed to perform aquatic work and inspections.</td>
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<table>
<thead>
<tr>
<th>SIMOPS</th>
<th>Simultaneous Operations</th>
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<table>
<thead>
<tr>
<th>SJA</th>
<th>Safe Job Analysis (part of the Risk Management)</th>
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<tr>
<td>SWL</td>
<td>Safe Work Load</td>
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<tr>
<td>TBT</td>
<td>Toolbox Talk (part of the Risk Management)</td>
</tr>
<tr>
<td>USBL</td>
<td>Ultra-short Baseline</td>
</tr>
<tr>
<td>Vessel</td>
<td>In the context of this Chapter, vessel means anchor handlers or tugs used to assist the MOU moving from and to location and to work on, deploy or recover MOU moorings.</td>
</tr>
<tr>
<td>QC</td>
<td>Quality Control</td>
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</table>

11.2 Jointly Agreed Procedures and Responsibilities

The parties involved will agree who will be responsible for the preparation of the Work Specification. In most instances this will be the MOU Management Company, who may delegate this task to an independent contractor acting on his behalf.

All parties are jointly responsible for ensuring adequate planning, risk management, documentation and execution, including contingencies.

Focus on sustainable operations during planning and execution of any Marine Operations should be taken into account, in order to minimize the effect on environment.

All parties should also agree on the risk management procedures to be observed and are jointly responsible for ensuring that this is complied with throughout the entire operation.

A MOC process should be included in the risk management procedures. Major deviation from the Work Specification should be permitted in accordance with this agreed management of change.
Reference should be made to Chapter 4 relating to the risk management process.

Each party involved should determine how its interests will be represented during the operation, and ensure that others are advised of the relevant arrangements.

A Work Specification that covers the entire operation shall be prepared. The Work Specification should be in the English language, unless otherwise agreed.

Identify who will have the responsibility and authority to specify necessary equipment in accordance with the Work Specification.

Ensure that satisfactory anchoring/mooring analyses have been prepared in compliance with national/industry requirements where relevant.

As early as practicable organise the pre-work specification meeting, to include risk management, if required.

Ensure that the work specification has been reviewed and is understood by all personnel that participate in the operation.

Arrange Inspection of selected vessels' technical specifications and certificates to verify suitability in accordance with marine assurance protocols agreed between the parties involved.

Inform vessels and MOU about the status of the operation at all times.

Any proposed personnel changes during MOU moving operations are to be arranged so that relief personnel have sufficient time to be fully briefed on status of work specification by those they are relieving.

Communicate any changes of the work specification to all the parties involved.

11.2.1 Operating Company

The Operator has the overall responsibility of the Operator's respective operations.

- Ensure that all parties involved in the marine operation have been approved by the operator, and that personnel engaged in the operation have the required qualification and competence to meet the responsibility given for each role.
- Obtain an overview of infrastructure on the seabed, seabottom conditions and any obstructions and provide to involved parties, include proximity agreements and provide contact details to owners/management of subsea infrastructure.
- Provide information to nearby installations if operators are in cooperation with regards to emergency preparedness or other matter.
- Notify the relevant authorities about the planned operations in advance or according to requirements.
- The operator shall specify minimum horizontal and vertical distances to infrastructure, pipelines and vulnerable natural seabed resources on the seabed for anchors and anchor lines.
- Is responsible for ensuring adequate planning (including contingencies) and risk assessment of the entire anchor handling and towing operation.
- Provide weather forecasts and relevant data.
- For an MOU move, Operator will normally be responsible for vessel and MOU chartering to meet the requirements in the scope of work.
To provide the vessel management company and vessels with details of maximum calculated loads for the operation.

Obtain positioning equipment and positioning personnel.

Obtain equipment supplier and equipment supplier personnel, if applicable.

Inform subcontractors in advance about the planned mobilisation and commencement of mooring operation. Notification should be made as early as possible.

Send notification to all involved parties of the work specification, risk management, load list, mobilisation plans, contingency plans and single point of contact in sufficient time.

Arrange the place and time to perform HSEQ briefing of the operator’s HSEQ expectations and MOU management company for presentation of work specification. Ideally, the meeting shall be held in advance on-shore, with the Operating company inviting all relevant parties, i.e., OIM, Vessel Masters, Marine Rep. QC positioning and Mooring equipment representative.

Arrange on site visit of the operator’s representatives for verification of the marine operations.

Provide the required documentation from anchor installation to rig owner, anchor positions, test tension, line length during installation, etc.

11.2.2 MOU Management Company

Notify authorities of MOU departure and arrival in accordance with local requirements.

Ensure the MOU is adequately manned by qualified and competent personnel, taking into account hours of rest requirements and the work specification.

Provide personnel, as required, to cover 24/7 operation.

Ensure arrangements for provision of additional/back-up mooring equipment, if required, are in place.

Obtain equipment supplier and equipment supplier personnel, if applicable.

Ensure that mooring analysis and work specification for both pre-lay and MOU move is prepared and approved in accordance with applicable regulations prior to commencement of operation.

Exemptions from the already agreed work specifications shall be approved by MOU management company (e.g. anchor installation, anchors positions, test tension, line length during installation).

11.2.3 OIM

The OIM has the overall responsibility and the authority for the HSEQ management of the facility and personnel as per statutory requirements and MOU management company’s policies.

The OIM has the overall responsibility for all activities inside MOU the safety zone, including all mooring system connected to the MOU.

In relation to the movement of the MOU, Operational responsibility may be delegated to a suitably qualified person such as the Tow Master who should also consult with vessel and Masters in the process. If operational responsibility is delegated to a Tow Master, the OIM still has responsibility for the entire operation.

Decision as to when it is safe and practicable to commence operations within the limitations of the MOU operating manual, having consulted with the Operators representative and the Vessels Master.
• Ensuring that a meeting is held with all relevant personnel on board prior to operation, minutes documented in accordance with Company policy and an appropriate entry made in the deck log book. Outcome of meeting to be sent to vessel Masters and Offshore Marine Representatives.
• Ensuring procedures are in place to monitor each vessel’s operation, and to monitor ongoing status of the operation.
• Ensure the function of and monitor the effectiveness of communications between all involved parties.
• Acts as the sole point of contact through which all operation notifications and exterior communications will pass and ensures that all relevant authorities are kept informed of the operation, as required.
• Liaises and communicates with the Operating Company representative on all matters concerned with the operation and any deviation from the agreed work specification.

11.2.4 Vessel Management Company

Responsibilities of the vessel management company include, but are not limited to:
• Ensuring that vessels are in good operational order and in compliance with relevant legislation and charter party requirements.
• Ensuring that vessels are manned by qualified and competent personnel taking into account hours of rest requirements and work specification including possibility of 24/7 working.
• Ensuring that any proposed personnel changes during MOU moving operations are arranged to allow sufficient time for a briefing on work specification and experience transfer to be completed.
• Ensuring that the vessel’s crew can calculate and monitor stability information for all stages of the intended operation.
• Shall carry out a review of the vessel’s stability calculations prior to commencement of operations.
• Ensuring that ship specific anchor handling manual or procedures are included in each vessels’ safety management system and that such documents are available on board.
• Ensure that a clearly defined clear-deck policy is present. The clear deck policy shall be understood and implemented on each vessel.
• Ensuring that details of the vessels provided to brokers and charterers are correct and current.
• Ensure that lesson learned within the industry and other vessels in the company are distributed to the vessel masters.

11.2.5 Vessel Master

The prime responsibility of the Master of any vessel is to safeguard the safety of crew, equipment on board and environment at all times. The Master shall stop operations that may put personnel, vessel or environment at risk.

All personnel involved have the right to call a stop at any time. In multi vessel operations, Masters should avoid allowing perceived “Peer” pressure to influence the overall decision-making process.

Other responsibilities include, but are not limited to:
• Ensuring that the manning on board is sufficient, based on working hour provisions, the operation work specification and that the crew is rested.
• Ensuring that the vessel’s own AH equipment on board is in good condition and certificated as required and meets the requirements of the Work Specification. Ensuring loaded equipment is in good condition and meets the requirements in the Work Specification.

• Ensure ID registration of deployed equipment is performed and in accordance with documentation from equipment supplier. The actual ID registration can be carried out by, i.e., equipment supplier offshore supervisor, Offshore Marine Representative or qualified vessel crew.

• Defects or non-conformities to the anchor/mooring equipment found during the operation are to be reported in accordance to the Work Specification.

• Ensure compliance with vessel management company’s and charterer’s HSSEQ policies

• Reporting to the OIM on the MOU of any accident, incident or vessel deficiency/limitation occurring during the operation.

• Ensuring that a vessel Risk Management Process has been performed and recorded, in accordance with the specific work specification, ensuring that agreed work specification is communicated to all crew members involved in operation.

• Ensuring that the stability of the ship is calculated and recorded, for each step in the work specification including worst-case expected dynamic loads.

• Ensuring that sufficient spare parts and consumables are on board for the intended operation.

• Ensuring that the personnel who will be involved in the operation have been adequately briefed as to the nature of their duties, responsibilities and authorities.

• In cooperation with the Offshore Marine Representative, ensure that MOC procedures are complied with in case of changes to the Work Specification, including risk management for the changes.

• Ensuring that, prior to commencement of tow, a detailed passage plan is prepared and sent to the OIM and Offshore Marine Representative for review and approval.

11.2.6 Offshore Marine Representative

• Operator’s representative during marine activities, ensuring to follow up operator’s interests.

• Present operators HSEQ requirements during briefs, safety meetings and ensure compliance during operations.

• Coordinate and supervise all marine activities involved in the mooring operations.

• Liaise between operator and all involved parties during operations.

• Give advice to involved parties during operations.

• Ensure that work specification, rules and regulations, including operator’s requirements are met in the operations.

• Notify involved parties about the ongoing operations (cable owner/ subsea asset owner/ authorities/ vessels/ MOU/ base/ sub-contractors) in cooperation with operator.

• Contact point between all involved parties offshore and reports to operator.

• Alert operator about accidents, incidents and near misses or if any requirements are not met.

• Ensure mooring is conducted in compliance with the work specification and mooring analysis, verify line length, final anchor position and, if applicable, anchor penetration during prelay.

• Responsible for providing all required documentation to operator e.g. daily reports, tension declaration to achieve approved mooring according to regulations.

• Onboard the MOU, the Offshore Marine Representative reports to Operators representative regarding the ongoing operations.

• Authorized to approve exemptions to anchoring work specification previously agreed, if conditions on-site make such exemptions reasonable and the protection level against
damage to any assets remains unchanged. The change to be made should not compromise
the result of the mooring analysis and final authority approval. Exemptions shall be agreed
with the involved parties, documented according to work specification and the operator
informed prior to such change.

- Ensure that vessel Masters are carrying out a proper review of the Work Specification, i.e.
  SJA/TBT, crew-list.
- Verify stability calculations received from vessel’s Master prior to commencement of
  operation.
- Execute debrief on completion of operation in order to capture lessons learnt for
  implementation during future operations.

11.2.7 ROV Supervisor

- The ROV Supervisor is responsible for the safety of the ROV and ROV personnel during
  operations, and reports to vessel Master.
- Ensure that ROV crew is familiar with the work specification.
- Ensure that all necessary spare parts are onboard at all times.
- Shall be responsible for the maintenance of the ROV.
- Responsible for ensuring that the ROV is deployed and recovered within its limitations and
  capacities with regards to weather and any other limitations.
- Ensure the relevant video recordings are safely stored and delivered to the Offshore Marine
  Representative upon completion.

11.2.8 Equipment Supplier

- Verify that all equipment delivered is loaded according to the requirements of the work
  specification.
- Ensure that all supplied equipment is certified and suitable for use.
- Ensure availability of any special equipment required to handle equipment offshore is in place
  e.g. twist removal set, Allen keys, etc.
- Check and verify supplied equipment during mobilisation onto vessel.
- Supply equipment manufacturer guidance for correct equipment handling.
- If represented offshore: Ensure line drawings are prepared and sent to OIM and Offshore
  Marine Representative for verification.
- Prepare and send equipment manifests and load lists.
- Verify condition of supplied equipment during demobilisation from vessel.
- Record and report any damage to equipment during operations.

11.2.9 Survey and Positioning Supplier

- Ensure the correct coordinate reference system is used.
- Perform system setup and checks of the navigation system prior to operation.
- Responsible for visualizing data showing the position of the unit and Vessel and, if needed,
  any other attending vessels at all time during the operations.
- Ensure high accuracy and precision is maintained during the entire operation.
- Ensure that all relevant field data, especially with respect to pipelines, umbilical and subsea
  equipment, is displayed on the navigation screen as appropriate.
- Maintain detailed logs of the operations.
• Calculate catenaries of the mooring lines, if required.
• Monitor vessel positions and inform vessel Masters and operator’s Offshore Marine Representative of any deviations to plans, e.g. deviation in mooring line bearing and distance.
• Ensure interface with ROV and perform USBL position verification towards known location, if applicable.

11.3 Preparations
A detailed written Work Specification should provide all necessary detailed information for the proposed operations.
It should contribute to providing a common understanding of the operation and should outline framework conditions using images, animations, organograms and diagrams where possible. It is intended for use during the planning, execution, verification and demobilisation of the operation.

11.3.1 Contents of Work Specification
The Work Specification should include, but not be limited to, the following information:
1. Identification of key roles and responsibilities, including contact details.
2. Define HSEQ expectations and reporting requirements by all parties. (Reference should be made to GOMO Chapter 4 relating to risk management process.)
3. General Information
   - Weather criteria.
   - Time estimate for each phase of the operation.
   - Requirements for vessels.
   - Details regarding AH equipment.
   - Details of weather forecast.
   - Communications (e.g. VHF & UHF, and tel. nos. to rig, vessels, base).
   - Additional personnel requirements.
4. Information on MOU
   - Main data (e.g. type, year of construction, length, width).
   - Mooring system (e.g. number of lines, chain/wire type and length, anchor type/weight).
   - PCP length, dimension, socket type and any chain tails (both ends).
   - Design and SWL of towing gear.
   - Various propulsion systems (size and type of thrusters, DP capabilities of MOU).
   - Draft of the MOU (transit draft/operational draft, survival draft).
   - Contact details (vessels and MOU).
5. Field Information
   - Position, water depth, and sea bottom conditions. (Datum used in coordinates shall be clearly stated).
- Details of stand of location, if applicable.
- Maps showing infrastructure (e.g. pipelines and templates).

   - Mobilization port - base.
   - Mooring equipment lists including spare equipment.

7. Vessel Requirement and Capabilities.
   The requirements must coincide with the operator's requirements
   - Bollard pull.
   - Tugger wires and working wires (e.g. number, dimension).
   - Winch capacity (e.g. pull, drum capacity, diameter and number of drums).
   - Chain Cabelar, number and dimensions.
   - Chain lockers, number and capacity.
   - Secondary winches, number and capacity.
   - Deck capacity.
   - Guide pins/shark jaws/Karm forks.
   - Requirements related to wire terminations.
   - Stern roller: single or double.

8. MOC process.

9. Identify and set trigger and hold points which determine operation start / stop / hold or Risk Assessment.

Examples of trigger Point:
- Significant sea height reaches XX metres\(^1\)
- Wind velocity reaches XX knots\(^1\)
- Current velocity reaches XX knots or adversely impacts on operations
- Reduced Visibility
- Unexpected loads experienced either by any Vessel or the MOU
- Mooring equipment problems
- Any technical problems aboard any Vessel or MOU
- Any technical faults with the survey equipment
- If at any stage there is any doubt about being able to maintain the clearance between the deployed chain or wire catenary and any sub-sea asset

\(^1\) Significant sea height, wind and current velocities to be determined by operational considerations or risk management.
Examples of hold point:

- Prior to recovering Secondary Moorings
- Prior to recovering Primary Moorings and Going on Tow
- Prior to entering safety zone at destination location
- Prior to manoeuvring / mooring operations at destination location
- Prior to running secondary moorings
- Prior to moving along side or over another structure
- Prior to commencing simultaneous operations

10. Show clearly the order of work and method to be utilised.
11. ROV survey requirements, where applicable.
12. Maximum calculated loads and dynamic tensions likely to be experienced by any vessel during the course of operations.
13. Detailed drawings of the following:
   a. Anchor pattern.
   b. Each stage of operation when moving off or onto location, if required.
   c. Make up of mooring lines, including any extra equipment in use. Details of lengths and connection types are to be included.
   d. Catenary calculations for relevant stages of the operation.
15. Manufacture’s recommendations for use and handling of mooring equipment.

11.3.2 Pre-Operation Meeting Onshore

The pre-operational meeting onshore should be held well in advance of the commencement of operations. A Preliminary Work Specification for MOU move should be available and reviewed by all relevant parties.

The Operating company shall ensure that minutes from the meeting are recorded and distributed accordingly. Any actions or requirements shall be distributed with a responsible person for each action and due dates for closing out the actions. All Actions shall be closed prior to commencement of operation.

11.3.2.1 Participants

Appropriate personnel should be made available for this meeting and may include the following:

1. OIM or MOU designate either in person or participating remotely (Tow Master, if applicable).
2. Representatives from MOU owner operations department.
   (Note that in some jurisdictions the MOU Safety Delegate may also be required to attend).
3. Onshore and Offshore supervisor for operating company.
4. Onshore logistics representative from operating company.
5. Offshore Marine Representative/Coordinator/Superintendent from operating company.
6. Representative from navigation positioning/survey company or contractor.
7. Operating company’s navigation/positioning/survey representative.
8. Representative from owner/operator of any third parties having interests in the vicinity of proposed operations.
9. Representative of Owners or Masters of the vessels involved, if on charter at time of meeting or where options exist for later employment.
   Alternatively, vessel representatives and crew may be thoroughly briefed in the operation at a later stage, prior to commencement.

11.3.2.2. Meeting Agenda
As a minimum the agenda of the Pre-Operational meeting should include, but not be limited to:
1. Confirmation of responsibilities and authorities.
3. Confirmation that onshore pre-move HIRA has been completed, with outcomes available for discussion during the meeting.
   Note: If this is not the case, the HIRA should be included on the agenda.
4. Confirm who is to provide weather forecast data, wave, tidal stream and current data. It is recommended that two independent weather forecasters are available for the entire operation.
5. Confirm the anticipated loads which may be experienced by vessels are included in the Work Specification.
6. Confirm positioning equipment and positioning personnel.
7. Determine logistics needs, for complete Work Specification.
8. Confirm all equipment to be utilised is available, has been confirmed fit for purpose by inspection and certified.
9. Review of Risk assessments for operation and transfer of experience.
10. Weather and environmental limitations and definition of operational criteria, review and set trigger/hold points as required.
11. Navigational data and references are confirmed.
12. ROV inspection requirements, where relevant.
13. Review details of anchor pattern and mooring equipment inclusive of maximum calculated loads and dynamic tensions and any pre-tensioning requirements.
14. Pre-lay of anchors, if applicable.
15. Vessel requirements; manning, quantity and technical specifications.
16. Manning on MOU.
17. Anticipated duration of each phase of the operation.
18. Contingency plans and equipment.
19. Equipment lists for the individual vessel(s).
20. Sea bed and soil conditions, with special attention towards vulnerable natural seabed resources and infrastructure.
21. Communication lines, and contact details.
22. Lessons learned from previous operations.
23. Move vessel and MOU operational equipment general guidance.
24. Expected commencement date of the operation.

11.3.3 Vessel Preparations

11.3.3.1. Towing and Anchor Handling Equipment Register

In addition to maintaining its own statutory requirements, it is recommended that a vessel specific towing and anchor handling equipment register is maintained to record the status of certification, maintenance, and condition of equipment.

The register should include, but not be limited to, all wires, chains, joining links and segments that might be used during anchor handling- and towing operations. These records should always be maintained and kept up to date.

11.3.3.2. Inspection of Equipment

It is considered as “best practice” that all anchor handling and towing equipment is inspected after each use; particularly wires used in the course of operations should be inspected regularly. Records of inspection should be included in the register with actual condition.

11.3.3.3. Preparations for Operations

During any operation, as a minimum, the following should be in place:

1. All equipment to be maintained and operated in accordance with manufacturer’s instructions.
2. Oxy-Acetylene or similar cutting gear, with adequate consumables to be available, prepared and tested for immediate use.
3. Operational mechanical stoppers or similar means to safely and effectively secure wire pennants, recognising likely loads on the wire and the load-bearing capacity of termination used.
4. Vessel equipment e.g. chain lockers, Chain Cabelar, storage drums are set up in accordance with the requirements of the work specification.
5. Prior to commencement of loading all restricted areas and open hatches are cordoned off.
6. Alloy ferrule terminations are not considered suitable and should not be used. (add to best practice)
**Note:** Care must be taken when opening wire coils, particularly pennant wires, as coils springing open following release of securing bands may cause injury. Turntables should be used. Vessel crews should ensure that stowage of anchors and equipment should be secured in the course of operations and alert to the risk of movement when securing arrangements are released. Certain types of anchor are inherently unstable and may fall over due to vessel movement.

### 11.3.4 MOU Preparation

#### 11.3.4.1. Mooring winches, Towing gear and Anchor Handling Equipment

Mooring winches, Towing gear and Anchor Handling Equipment Register should be kept updated in accordance to the company’s procedure.

In addition to maintaining its own statutory requirement, it is recommended that the MOU’s equipment register is maintained to record the status of certification, maintenance, and condition of equipment.

#### 11.3.4.2. Inspection and Testing of Equipment

It is considered “best practice” that all anchor handling and towing equipment is inspected after each use, particularly wires used in the course of operations should be inspected regularly. Records of inspection should be included in the register with actual condition.

Mooring winches should be tested prior to commencements of the operation.

Verification should be made that mooring winch readings are correct. This should be done prior to commencement.

All wire slings and correct adaptors should be connected to PCPs prior to commencement of operation.

Testing of emergency release, including deluge system, should be performed on completion of the mooring operation.

### 11.4 Execution phase

#### 11.4.1 Mobilisation and Demobilisation

#### 11.4.1.1. Initial notification

Prior to Mobilization, the Call off for the operation shall be sent out by the Operator, Initial Notification message.

As a minimum, this shall contain, but not limited to:

- Work Specification
- Loading list
- Details of mobilization port including on-hire time and ETA mobilization port
- Expected duration of work
Any additional personnel signing on for the operation
Vessel details and contact information
Weather forecast details and login
Details on vessel brief
Nominate one lead/HSE vessel
ROV requirement
Data card, App 3-A
Details of Marine Assurance, if required

The Master shall accept terms of notification to operator and confirm vessel’s suitability in accordance to the Work Specification.

11.4.1.2. Briefing of vessels and MOU

A representative for the rig owner and/or operator should go through the SOW in details. Intention of the brief is to ensure that the rig and vessel crew has the full understanding of the operation and the risk picture for the forthcoming operation. This should be taken into account when the unit and vessel is reviewing the Risk Management Process prior to commencement of the operation.

11.4.1.3. Participants MOU

Recommended participants for this meeting should therefore include, but are not necessarily limited to the following:

1. OIM and delegate (will normally act as Chairperson).
2. Tow Masters.
3. Offshore Supervisors for operating company.
4. Marine Representatives for operating company.
5. MOU Marine personnel.
6. Party Chief from navigation/positioning/survey contractor.
7. Representatives from owner/operator of any third-party interests if attending on board the unit.
8. Any additional Owner/Operator personne,l as required.

11.4.1.4. Participants vessel

Recommended participants for this meeting should therefore include, but are not necessarily limited to the following:

1. Master and delegate.
2. Chief Officer.
3. Marine Representative(s) for operating company.
4. Party Chief from navigation/positioning/survey contractor.
5. Equipment supplier.
7. Deck crew.
8. ROV personnel.
9. Additional personnel, as required.

11.4.1.5. Meeting Agenda

As a minimum, the agenda of the Pre-Operational meeting will include, but not necessarily limited to the following:

1. Confirmation of responsibilities and authorities.
2. Confirm work specification and revision number in use is shared by all parties.
3. Confirm receipt of weather forecast data, wave, tidal stream and current data.
4. Confirm that the vessel Master has received details of maximum calculated loads for the operation.
5. Confirm readiness of positioning equipment and personnel.
6. Review of schedule, logistics needs and notifications of interested parties or external agencies.
7. Confirm state of readiness of Vessel, MOU and Equipment.
8. Confirm that onboard risk assessment for intended operations has been completed and outcomes passed to Supervisors for inclusion in subsequent tool box talks.
9. Trigger and hold points set or confirmed.
10. Confirm ROV inspection requirements.
11. Confirm multiple vessel operations, if required.
12. Vessel roles and responsibilities, and sequence of operations to be confirmed.
13. Communication lines to be confirmed.

11.4.1.6. Loading of vessel

1. Toolbox Talk, part of the R/M process, between all parties involved in the loading of Anchor handling equipment prior to commencement, including establishment of communication plan for the operation.
2. Equipment should be loaded with attention to the sequence it should be used during operation.
3. All equipment should be handled in accordance to manufacturers recommendation, ref. App.11-B.

11.4.2 Notification

Where required, OIM or delegate, in cooperation with vessels and Offshore Marine Representative or Tow Master, should notify to the appropriate National and local authorities, adjacent facilities and to local operations as required as detailed in Work Specification.
11.4.3 Pre-lay Operation

Pre-lay operations are the installation of anchors and bottom chains prior to the MOU’s arrival at location. The pre-laid system may be buoyed off or laid down on completion of installation. The MOU will be connected to the pre-laid system on arrival at location.

The pre-lay is a potential hazardous operation, with regards to high tensions and limited deck space. It is of highest priority that the Clear Deck Policy is adhered to during the entire operation.

11.4.3.1. Deployment

The vessel shall position, at a safe distance from seabed infrastructure, ideally equal to or larger than the water depth, before deploying the anchor. The vessel shall then begin to lower the anchor towards the seabed.

When the anchor is approximately 10m from seabed, the vessel shall run in towards the proposed anchor landing position, on DP, with ROV, (if available), following the anchor towards landing position.

The vessel Master and Offshore Marine Rep to determine the position of anchor deployment based on prevailing conditions and work specification. The Survey Representative to assist.

The anchor landing position should be equal to the expected drag length distance from intended position. Distance to infrastructure to be considered.

The landing of the anchor shall be supported by ROV, if available, to ensure the following:

- The anchor has landed correctly.
- The anchor is correctly orientated.
- The anchor position is within the tolerances set in the work specification.

When the anchor is set, the vessel shall pay out the required chain/wire length and prepare to test tension the anchor in accordance with the work specification.

**Note:** A bridle should be fitted to the stern of the anchor to assist in ensuring the correct orientation during deployment.

11.4.3.2. Testing Anchor Holding Capacity and Anchor Position Verification

Once the chain is deployed, the vessel shall connect its tensioning swivel and work wire/Chain and pay out according to the Work Specification.

The vessel shall perform the test tensioning according to Work Specification and mooring analysis. The tension should be increased and decreased in a slow and controlled manner in order to achieve the desired tension.

Once the desired tension has been reached, the Offshore Marine Representative shall confirm and record this.

The Survey Representative shall take a position fix with chain end on stern roller to calculate the line length and estimate the anchor position.

If the anchor position is out with the tolerance set in the work specification, check position using an ROV. If it is still out with the tolerance, the anchor is to be recovered and re-set as per the Work Specification.

The ROV should observe the anchor penetration.

Anchor final position shall approved by Offshore Marine Representative.
If the anchor line is buoyed off, a safe release method is recommended, see App. 11-B.

11.4.3.3. Dual vessel operation

If dual vessel operation is required to achieve the required tension, it is recommended to perform the operation connected into the anchor line by delta plate in order to verify anchor holding capacity.

**Note:** Load sharing operations are not recommended and should be avoided, if possible.

11.4.3.4. ROV Operations

It is recommended to use ROV inspection during the pre-lay operation. The ROV will support the following:

- The anchor has landed correctly.
- The anchor is correctly orientated.
- The anchor position is within the tolerances set in the work specification.
- Final position and penetration.

ROV support will give the operation a higher probability of a successful tension test.

**Note:** In soft soil the anchor may fully penetrate and therefore it is not possible to verify the final anchor position. The use of a marker buoy placed on the chain approx. 50-100m from the anchor. This will enable the ROV to verify the final anchor position.

In addition to the points mentioned above, the use of ROV shall be considered to ensure the following:

- As left line survey including position of sub-surface buoyancy
- Verification of subsea infrastructure location prior to commencement of operations
- Mapping of protected species within the anchor pattern (where required)

11.4.4 MOU Move Operation

The MOU move is a potential hazardous operation, with regards proximity to the MOU, multiple vessel involvement, limited deck space and high tensions.

**The operations should be performed in accordance with the Work Specification.**

**Special attention should be paid to the following:**

- A clear and defined communication plan shall be in place, and tested, as per the work specification.
- Clear Deck Policy shall be adhered to during the entire operation.
- Close attention should be paid to the length and catenary of each mooring line and its relation to the water depth and any subsea infrastructure, with due regard to cross track distances.
- The passing of the PCP is one of the most critical phases during the MOU move. It is important to be prepared on the vessel deck and bridge. The same preparation should be done onboard the rig, in the CCR, for the winch operator and crane operator prior to vessel moving into final position.
Note: it is critical that the vessel is in direct communication with the crane and winch operators at this stage.

11.4.5 Exchange of Information During Anchor Handling Operations

The MOU is required to monitor the following and report any relevant changes to the vessels:

1. Integrity of the unit.
2. Disconnection and recovery of towing connections and assemblies
3. Weather conditions and forecast weather window are suitable for operations.
4. MOU winch pay-out and recovery speeds.
5. MOU propulsion assistance.
6. Communications between MOU Cranes, Winch Operators, OIM and/or delegate and Vessels.

Vessels are required to monitor the following and report any relevant changes to the MOU:

1. Integrity of the vessel
2. Alterations to heaving in or pay out speeds and changes to vessel heading and power.
3. Mooring catenaries and required clearances.
4. Dynamic forces.
5. Environmental conditions.
6. Condition of mooring and vessel equipment.
7. Deviations from work specification.

11.4.5.1. SIMOPS

Any Simultaneous marine operations within the safety zone shall be thoroughly risk assessed prior to commencement.

Non-marine relevant SIMOPS should be identified and assessed towards the MOU move operation, during the MOU move operation anchor handling activities should be given priority. All such activities should be coordinated by the MOU’s personnel in charge and Offshore Marine Representative.

11.4.5.2. Monitor Marine traffic

Marine traffic in the proximity should be monitored during all stages of the operation. The requirement for assigned guard vessel should be decided prior to operations.

The tasks included may include, but not be limited to:

1. Monitoring and plotting of vessel traffic within proximity of the scene of operations.
2. Use all available means to warn vessels whose course is approaching the scene of operations too closely which may result in risk to themselves or other vessels.
11.4.6 Recovery of Anchor Lines

The recovery operations are hazardous and due regard shall be given to high tension, limited deck space and that clear deck policy is adhered to during the entire operation.

High force is often required to break out pre-laid anchor systems, attention should be on reducing the risk of damage to equipment and limiting the tow force used while breaking out anchor. It is recommended to be patient and have sufficient length of chain and/or wire paid out so the equipment is not subjected to damage caused by dynamic peak forces leading to equipment damage.

Notes:

1. Special attention should be given when working in shallow water as any vessel movement may result in dynamic forces, attention shall be on control of vessel position movement and length paid out to avoid overload.

2. If breaking out anchors by use of chaser there is a possibility of damaging the PCP system, work wire and anchor if the wire is overloaded whilst breaking the anchor loose from the bottom.

Breaking out of the anchors using the shark jaws should be avoided, where possible, to avoid any potential damage to the chain. The preferred method is to break out the anchor with the chain on the vessels winch so that the tension can be monitored and controlled.

An ROV pick up system connected to the anchors bridle may preferably be used to break out the anchor.

The tension, which during the above mentioned method is used on the wire, is dependent on following circumstances:

1. Winch pull force, depending on the size of the winch and how many layers are on the drum. If using one of the bigger winch sizes it is easily possible to exceed the breaking load of the wire.

2. The vessel buoyancy combined with sea state forces in a sea may exceed the breaking load of the wire by many times regardless of the capacity of the winch.

In the illustration below, 200 is the maximum break loose force.
11.4.6.1. On Recovery to Deck

Best efforts shall be made to clean the anchor and chain during recovery using the vessels fire hose or ballast system.

Once the equipment has been recovered and secured, it shall be inspected for damage. Any damage shall be recorded and reported as required by the Work Specification.

11.5 Marine Operations - Tow

11.5.1 Introduction and planning of Tow

The Master of the towing vessel is responsible for the preparation of a detailed passage plan and the subsequent safe navigation of the tow, ref. Section 12.2.3.3 of these Guidelines. The passage plan should comply with COLREGS. Where appropriate, navigation warnings shall be broadcast by the lead tug at regular intervals.

The passage plan must be carefully developed with regards to water depth, other offshore and subsea facilities, and emergency locations or refuges which may be utilised if required.

Close attention should be paid to the length and catenaries of the tow wire and its relation to environmental conditions, water depth and vertical clearance over any sub-sea assets in vicinity of any location or whilst on passage.

The passage plan will be forwarded to the OIM on the unit and Masters on other towing vessels for review/comment prior to the commencement of operations.
Where more than one vessel is utilised to tow the unit a lead tug will be nominated by the OIM. The Master of this vessel will assume the responsibilities described above and shall also ensure that the other vessels involved comply with the plans.

This does not, however, relieve the Master of any vessel from the responsibility of safeguarding the safety of personnel and equipment on board own ship.

The transfer of command should be agreed via radio and the times logged by both MOU and the lead Tow vessel. The towing operation will conclude when direction of the tow has been returned to the OIM from the Master of the lead tow vessel.

Manoeuvring operations on and off locations are directed by the OIM or OIM’s delegate.

Maximum tension whilst towing must never exceed 50% of MBL of weakest link in the assembly. It is recommended to aim for tension utilization of 30% of the MBL to allow room for peak loads.

Winch tension controls, where available, may be set with the above recommendations in mind.

Marine operations are to be planned and procedures developed which are both safe and practicable. The planning should follow well proven principles, techniques, systems and equipment to ensure that acceptable levels of health and safety are met and thus prevent loss of life, damage to the environment and economic loss.

Where new techniques or the extending of existing technology is proposed, these should also be included within the planning process.

Tow routes should be surveyed and examined prior to the commencement of the operation. Ports of refuge should be identified along the towing route that will serve as a ‘place of shelter’ for the tow.

All planning should be based, wherever possible, on the premise that the operation is reversible from an operational point of view.

11.5.2 Weather Forecasting

Weather forecasts should be obtained from a minimum of two reputable weather forecasters which have detailed knowledge of the area in which the tow is to be undertaken.

The forecasts should be supplied at a minimum 12-hour intervals and contain forecasts for the next 48 hours with an outlook of the weather for the forthcoming 3 to 5 days period.

The forecasts should be supplied for a period exceeding 72 hours prior to commencement of the tow.

A Means must be available on the lead tow vessel to receive weather forecasts via satellite or radio communications.

11.5.3 Documents and Records

The lead tow vessel, as well as all other vessels undertaking the tow, should be supplied with all relevant documented procedures relating to the operation.

The lead tow vessel shall keep an operational logbook in which any deviation from the approved procedures are recorded as well as the route being followed.
11.5.4 Tow Plan

A standalone Tow Plan should be provided when one of the following criteria are met:

- Anticipated tow time exceeds 24 hours;
- The tow route or make-up is of an unusual design;
- The client specifically requests the drafting of such a document.

The Tow Plan should be prepared to cover all normal, contingency and emergency aspects of the tow operation and shall be presented in such a manner that reduces repetitiveness and information overload.

The manual should provide a set of procedures to be followed by all personnel engaged in the tow operation. Details to be provided in the manual should cover the following aspects:

- A general overview of the tow.
- The route to be followed both main and alternative (where appropriate)
- Pilotage and arrival protocols
- Weather forecasting arrangements.
- Limiting environmental conditions.
- Details of the towing equipment used, identifying MBLs for all equipment in the critical path.
- Details of emergency towing equipment and how it is deployed.
- Tow wire and catenary management.
- Contingency plans and arrangements
- Safety procedures.
- A list of relevant emergency contacts.
- Ports of refuge.
- Log entry details, reporting procedures.
- Organisation and communication details.
- Details of the vessels to be used.
- Details of the grillage and sea fastenings (if any).
- A ballast plan and stability and damaged stability calculations.

11.5.5 Escort Vessels

Where the unit being towed is either unmanned/non-self-propelled a suitable escort vessel meeting the requirements of the designated tow vessel should be considered.

The escort vessel shall maintain a position close to the tow to allow the escort vessel to assist in a timely and ready manner.

The escort vessel shall at all times be ready to pick up the emergency tow arrangement or assist as required by the OIM or delegate.
11.5.6 Emergency Tow Equipment

Emergency tow equipment shall be provided for all tow operations. The deployment of the emergency tow arrangement shall be designed to be unhindered in the event of the main tow bridle parting.

Where possible, the emergency tow line shall not be streamed for the duration of the tow. Where the tow is unmanned, the designated tow vessel and the escort vessel shall have means of remotely deploying the emergency tow line.

A drill/training exercise should be taken immediately ahead of the tow operation involving the personnel who have a duty in deploying the emergency tow line. A substitute person should also be included in the event of incapacitation.

11.5.7 Unmanned Tows

When tows are unmanned, no contingency action shall involve changing the status of the MOU. For example, altering draft, use of thrusters, or any other action that requires personnel to board the towed unit.

A suitable power supply must be fitted to allow nautical signalling lights to be fully operative in accordance with the COLREGS.

The status of the towed unit, including draft, power status, and access, is to be confirmed by the vessel Master prior to departure.

11.5.8 Exchange of Information During Towing Operation

The MOU is required to monitor the following and report any changes to the lead tow vessel:

1. Compliance with COLREGS on the unit, including lights and shapes on the tow.
2. Towing connections.
3. Weather conditions and forecasts.
4. Integrity of the unit.
5. MOU propulsion assistance, if relevant.

The Vessel is required to monitor the following and report any changes to the MOU:

1. Compliance with COLREGS.
2. Towline, particularly prevention of any chafing or friction. Either use towing sleeve, or regularly adjust wire length.
3. On passage towing speed and heading.
4. Deviations from passage plan.
5. Adjustments to power output.
6. Total tow length and catenary profile in relation to water depth.

Note: If towing a MOU on anchor chains, the MOU may pay out chain to provide the optimum towing catenaries.
Whilst towing, clear deck policies shall be observed. Should any urgent or emergency work be required on the after deck whilst towing, this should be fully risk assessed.

If adverse weather expected the Master to consider whether use of towing-gog to control towing wire would be prudent or advantageous.

When towing in adverse weather, dynamic forces are significant. Exercise great caution, particularly when there is a following sea.

Towing logs are to be maintained by the vessel.

11.5.9 Record of Towing Operations

Vessels engaged in towing operations should maintain complete records of such activities. Particulars of the information to be recorded are included in Section 12.2.3.3 of these Guidelines.

11.6 Heading Control Operations

Heading control operations should be planned and executed in accordance with operator’s requirements and procedures. These should be sent to the heading control vessel owner prior to commencement of operation.

The vessel owner should revert with confirmation that they are able to meet the work specification for the operation.

Use of survey and positioning equipment, onboard the unit and heading control vessel, is deemed good practice.

11.7 Communications

Reference should be made to Chapter 6 of these Guidelines relating to Communications.

Communications in accordance with the Work Specification should be established and tested between the MOU work stations, vessel bridge and deck crews and between the various vessels involved in the operation.

During anchor handling activities, a common VHF radio channel should be designated for use by the MOU and all vessels involved in the operation. This channel should not be used for other purposes whilst such activities are in progress.

Where several vessels are working together on the same operation, a specific communication plan for that activity must be established which in particular ensures an effective and coordinated action in the event of any unintended incident. It is recommended to dedicate 2 separate UHF frequencies. 1 for each side of the rig in order to reduce interference and possible misunderstanding.

Communication between vessel workstations where the Master and winch driver will be and the anchor handling deck must be decided prior to the operation.

Dependent on vessel’s equipment and the operation concerned, the best means of communication may be personal UHF radios with headset. Whichever means of communication is decided upon, it should be thoroughly tested prior to starting the operation.
**Note:** Stoppages, planned and unplanned, in the unmooring or mooring operation should be communicated to the vessels as early as possible. Information of the stop should be exchanged, which should include an estimate of the period the stop will last. The vessels should use the information to evaluate crew rest period. The possibility to stop generators and/or main engine for reducing fuel consumption and carbon footprint should be evaluated.

Information regarding when operation is expected to continue should be updated, in order to enable the vessels crew and generators/enginesto be ready when required.

### 11.8 Vessel Stability

The stability of the vessel is the responsibility of the Master and stability calculations shall be performed prior to commencement of any anchor handling operation.

Stability calculations must consider the worst case and predicted scenarios which may occur during and towards the end of a prolonged Anchor handling operation. The stability calculations should also include, but not be limited to, loading of vessel, transit and discharging. This should consider consumption of fuel and other consumables together with loading and deployment of wire, chain or anchors.

Any specific conditions limiting the vessels stability (e.g. the use and limits of stability tanks, rig chain lockers, minimum fuel requirements and free surface moment) are to be considered. The available information shall show the maximum force in the wire/chain and the point where the lateral force is assumed to be applied (towing pin/stern roller).

If a stability calculator computer is used, it must be verified and approved by Class/Flag.

Prior to anchor handling operations the result of the stability calculations shall be readily available on the bridge. Result of the stability calculation should visualize the acceptable vertical and horizontal transverse force/tensions which the vessel can be exposed to. GZ curve and a table of the tension/forces which give the maximum acceptable heeling moment shall also be present.

Stability calculations should be able to demonstrate the acceptable vertical and horizontal (transverse) tension to which the vessel can be exposed, considering the most unfavourable conditions for transverse tension. The vessel’s maximum heeling angle is to be limited to one of the following angles, whichever occurs first

(see Figure below):

- Heeling angle equivalent to a righting lever (GZ) value equal to 50 per cent of the maximum righting lever
  
  \[(GZ \text{ MAX})\];

- Heeling angle which results in water on the working deck (deck is calculated as flat);

- 15 degrees.
Special attention during anchor handling should be paid to:

- During deep water operations, the weight on the stern roller can be hundreds of tons, which may be applied at a distance off the centre line according to the set-up of the towing pins. This may increase the listing moments and stern trim, increasing the risk of a flooded deck, e.g. from a breaking wave, which may result in a further temporary reduction in stability.
- Use of large rudder angles and thrusters may also decrease the vessel stability, especially when working with a limited stability criteria, e.g. a large amount of thrust applied to the same side as the vessel’s heel, which will increase the heeling.
- Normally, changes in the ballast condition should not be carried out during AH and Towing operations, unless the operation requires a change in vessel condition. The effect on the stability of any such change must be fully evaluated and risk assessed. Such changes should be forwarded in accordance to the work specification.
- If roll reduction tanks are used during the anchor handling operation, stability calculations for the tank optimally filled for roll reduction (maximum free surface moment) and a calculation for full tank are to be reviewed by the Master and the crew prior to operation.
- The status of all watertight, weather tight doors and hatches should be maintained as set out in the vessel’s operation manual. All such doors should be clearly signed to this effect.

Reference Documents

- HSE operations Notice #3, 6 & 65
- HSE OSD 21 for jack ups
- Warranty certificate of towage approval

11.9 Guidance on Bollard Pull and Vessel Working Limits

Masters should be aware that bollard pull, as measured for the vessel’s certificates, in some cases does not allow for the power used by deck machinery, thrusters and other consumers diverted from the main propulsion.

Allowance for any reduction should be made when considering bollard pull available during any operation.

For anchor break out operations, the values above may need to be exceeded. This must be risk assessed and as agreed by all parties.

11.10 Winch operation: Emergency Release and Emergency Stop

To release excessive tension winches and mechanical stoppering devices are fitted with emergency release mechanisms.
Maintenance and testing of these systems should be included as part of the planned maintenance regime and satisfactory operation should be verified before any anchor handling activities.

The vessel’s crew must be trained and competent in the operation of the emergency release systems in addition to being familiar with their reaction times and effect. Instructions giving information on how to operate the emergency stops and releases should be readily available on the vessel.

The winches should be operated in accordance to vessel’s Ship Specific Anchor Handling Manual and manufacturer’s instruction manual.

As a minimum, but not limited to, the following shall be displayed in the vicinity of the manoeuvring and winch operator area:

- Instruction and effect characteristics for: Emergency operation of Winches
- Instruction and effect characteristics for: Emergency operation of Towing pins and Shark Jaws.

11.11 Further Guidance for Particular Anchor Handling Operations

11.11.1 Considerations for Deeper Water

Anchor handling operations in deeper water carry significant additional hazards and these may be location specific, though it is recognized that this is an arbitrary distinction, and any assessment of what might be considered as “deep water” operations will take into account the capabilities of the vessels supporting such activities.

However, any operations beyond the continental shelf should always be considered as deep water activities.

Where deep water anchor handling operations are being planned additional factors should be taken into account in addition to those involved in normal anchor handling operations: These include, but are not limited to, the following:

1. Suitability of vessels for location specific operations, taking into account environmental and other variables.
2. To minimize damage to work wire from joining shackles use longer continuous lengths of work wire. Where joining is unavoidable to avoid damage use joining links rather than shackles.
3. All wires to be spooled onto the drum under tension.
4. Use work wire swivels to avoid twisting damage from the inherent high loads of deep water AH. Wires should be de-tensioned using suitable methods after use.
5. Swivels are used to avoid twisting damage in the wire when exposed to high tension. Swivels are also used to reduce the risk of torsion building up in the wire. Such torsion could be released when disconnecting work wire from PCP, with risk of serious injury to personnel.
6. Use of PCP chain tail in the shark jaws is particularly important in deep-water anchor handling operations.
7. Buoys should not be “free launched” from deck but deployed in controlled manner to avoid shock load damage.
8. Whilst deploying chain there may be a requirement for high tension to be used. Chain contact with the gypsy should therefore be maximized to avoid potentially dangerous slippage.
some circumstances, and where equipment is suitable, both gypsies may be used. Dynamic braking or tension control arrangements should be used, if available.

9. Fibre ropes are frequently used in deep water mooring arrangements for a variety of different reasons.

**Note:** Manufacturers’ guidelines for the use and handling of all equipment should always be complied with.

### 11.12 Reference of best practice

Examples of recommended good practice for the anchor handling systems referred to below can be found in Appendix 11-B.

Good guidance relating to the handling and use of equipment is also available from the various anchor and equipment manufacturers or suppliers.

1. Permanent chaser pendant (PCP).
2. Pennant Buoy System.
3. Working Wire/Chaser termination on vessel.
4. Piggyback system.
5. Chasing Pendant.
7. Fibre Rope handling.
8. Operation – Fibre in Mooring Lines.