

OLF/NSA GUIDELINES

FOR

SAFE ANCHOR HANDLING AND TOWING



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1. INTRODUCTION

1.1 Objective

The objective of the guidelines is to facilitate safe anchor handling and towing operations on the Norwegian Shelf. The guidelines are intended for those parties that through planning, work procedures or actions influence safe operations in connection with the interaction between operators, ship-owners, owners of installations, installations, vessels, bases and suppliers.

The guidelines are therefore intended for relevant personnel working for operators, owners of vessels and installations, and on installations, vessels and bases and for the suppliers of towing and anchor-handling equipment. This applies in particular to vessel masters/crew, personnel involved in anchor handling and towing operations, as well as offshore installation managers, crane or winch operators with a special responsibility for safeguarding safety aspects in connection with anchor handling and towing.

The guidelines contain a description of what is regarded as good working practices in the Norwegian offshore industry. Even though they are recommendations, they should not be deviated from unless alternative solutions or instructions are deemed to be equal or better than those set out in these guidelines.

These guidelines have been prepared within the framework of "Working Together for Safety".

1.2 Application

The guidelines apply to anchor handling and towing of mobile installations on the Norwegian Continental Shelf.

1.3 Responsibilities

The operating company/OIM is responsible for planning and implementing the anchoring operation, the safety of the installation and personnel on board, as well as any operations taking place within the installation's safety zone.

The Master is responsible for safety on board the anchor handling/towing vessel, for the crew and equipment at all times. This means, for example, that the Master has the authority, if necessary, to stop operations that threaten the safety of the vessel and/or its crew.

The Master must obtain permission from the OIM or the person assigned authority for maritime operations on his/her behalf before entering the safety zone.

The operator has a see-to responsibility for the planning and implementation of anchoring operations.

2. DEFINITIONS AND ABBREVIATIONS

2.1 Definitions

Working wire	Wire in working winch including termination, for example socket
Work winch	Winch for hoisting and setting anchors. Power, length, width and diameter determine the area of application of the working winch.
Bollard pull	The towing vessel's pull normally specified as maximum continuous pull.
Bridle (crowfoot) towing arrangement	Two wires/chains of equal length arranged as a triangle that connect the installation to the towing vessel.
Catenary curves	Specification of towline and anchor line curvature for various loads.
Chain tail	A short piece of chain consisting of two or more links
Deck crane on vessel	Crane for lifting and assembling equipment on deck.
Shark jaw	Device for connecting/disconnecting chains/wires.
Stern roller	Large stern roller for guiding chains and wires primarily, but also anchors.
Installation	Semi-submersible platforms, jack-ups, barges, etc.
J-chaser	Hook used by anchor handling vessels to "fish" the installation's anchor lines.
Gypsy	Wheel with machined pockets for hoisting chains fitted on a winch.
Kenter link	Device for linking two chain lengths.
Fairlead for chain	Device that guides chains towards gypsy and chain lockers.
NavTug	Navigation equipment placed on board the individual anchor handling vessel in connection with an anchoring operation which functions as an interface with the installation's (MOU) main navigation equipment.
Pear link	Device for linking two different chain dimensions.
Pendant	Wire hanging permanently attached to the installation used for chasing out anchors. PCP (Permanent Chain Pendant)

Permanent chaser	Ring fitted over the anchor line connected to the pendant wire. Used by AHV when hoisting or setting the installation's anchors.
Pigtail	Short chain/wire with open-end links.
Piggyback anchor	Anchor connected to primary anchor with wire/chain in case of insufficient holding power.
Towing winch	Winch of the same design as a working winch, but often with different gears. On newer vessels, the towing winch has a smaller drum than the working winch.
Towline	Wire on towing winch used for towing.
Spooling gear	Arrangement to guide wire onto drum.
Socket	Cast anchoring termination on wire.
Swivel	Connecting link/device used to take up wire rotation.
Towing pins/guide pins	Device for guiding towline/pennant wire, e.g. towards stern roller. Arrangement for keeping towline in centre line/midship area.
Tow eye/towline guide	Arrangement for keeping towline in centre line/midship area
Tension control	A type of constant tension control; may be set to pull in or pay out at a specified tension.
Tugger winch	Used for pulling equipment on deck during anchor handling, delivered with remote control on newer vessels, may also be controlled from the bridge on some vessels.
Tugger wire	Steel or fibre wire used for tugger winch.
Weather criteria	Specification of maximum allowed weather (wind, waves, etc.) when performing the operation.
Weather window	Specification of maximum allowed weather (wind, waves, etc.) when performing the operation for a specific time period.
Weak link	Weak link in a rigging arrangement.

2.2 Abbreviations

AHTS:	Anchor Handling Tug Supply vessel
AHV:	Anchor Handling Vessel
APB:	Anchor Pendant Buoy
DP:	Dynamic Positioning

IMDG:	International Maritime Dangerous Goods Code
IMO:	International Maritime Organization
ISM:	International Safety Management Code
MBL:	Minimum Breaking Load
ORQ:	Oil Rig Quality, chain quality designation
PCP	Permanent Chaser Pendant
PSA:	Petroleum Safety Authority Norway
ROV	Remotely Operated Vehicle
RUH:	Reporting of undesired incident (Norway only)
NMD:	Norwegian Maritime Directorate
SJA:	Safe Job Analysis
SSB:	Sub-Surface Buoy
STCW:	International Convention on Standards of Training, Certification and Watch-keeping for Seafarers
SWL:	Safe Working Load
UHF:	Ultra High Frequency
VHF:	Very High Frequency

2.3 References

References that apply in full or partially as agreed with the operating company:

- OLF/NSA Guidelines for Safety and Emergency Preparedness Training
- OLF/NSA Acceptance Criteria for Offshore Service Vessels
- Norwegian Maritime Directorate's rules for passenger and cargo vessels, etc.
- Norwegian Maritime Directorate's rules for mobile installations (most recent edition)
- Norwegian Maritime Directorate's Safety Notification No. 9 dated 3 April 2001 on incorrect use of shark jaws
- OLF/NSA 061 Guidelines for Safe Operation of Offshore Service Vessels
- DNV Rules for Planning and Execution of Marine Operations
- PSA's regulations

3 PLANNING AND EXECUTION OF ANCHOR HANDLING AND TOWING OPERATIONS

3.1 Preparation and planning of anchor handling

3.1.1 *Responsibilities of the operating company*

The operator is responsible for obtaining the information needed to anchor an installation in a field. The operator is responsible for chart data and verifications/approval of position charts.

The operator shall:

- Obtain an overview of infrastructure on the seabed.
- Specify horizontal/vertical minimum distances to installations and pipelines on the seabed for anchors and anchor lines.
- Carry out/make available risk analyses.
- Obtain verified information on sea bottom conditions and any obstructions.
- Obtain verified weather and wave data.
- Provide information on simultaneous operations.
- Provide updated charts with geographic positions and data, both in hard copy and electronic format.
- Carry out a briefing with representatives of the owner of the installation.
- The operator shall provide and make the vessels available for briefing and mobilisation in port.
- Provide base services for mobilisation in port.
- Organise an anchoring meeting well in advance of the start-up, see chapter 3.1.4.
- Verify the work specification and the anchoring analysis prepared by the owner of the installation.
- Obtain navigation services
- Provide a marine representative to be on the installation in all cases of anchoring, may be omitted in the anchoring for exploration wells.
- Determine logistics needs (deck cargo, bulk)
- Inform vessel and installation about the operation's status at all times
- Forward work specification to vessel as soon as possible.
- Endeavour to use dedicated UHF channels for communication between vessel and installation.

3.1.2 Responsibilities of owner of the installation

The owner of the installation shall:

- Prepare a work specification that covers the entire anchor handling or towing operation in accordance with the guidelines of Chapter 5. Submit a valid 3rd party approval for the line pattern to be used.
- Supervise the operation in the field.
- Communicate any changes to the work specification to the parties involved.
- Ensure that the work specification has been reviewed and that a Safe Job Analysis has been performed.
- Ensure that that the communication between all parties involved in the operation works.
- Send notification of expected departure and arrival to defined recipients at least two weeks before the operation.
- Provide any necessary anchoring equipment pursuant to the cargo list and follow up mobilisation on board vessel, see Chapter 5.
- Obtain extra personnel as required (OIM, personnel manager, winch operators, etc).
- Allocation of frequency for helicopter beacon (Radio Inspection TELENOR).
- Identify potential backload.

3.1.2.1 The OIM's responsibilities when vessels arrive in the field (500-metre zone)

It is the responsibility of the OIM to:

- Provide information of the last updated work specification
- Provide status of the operation and weather report
- Perform a communication check

3.1.3 Responsibilities of the Master

The Master of the AHTS is responsible for:

- Ensuring that planned operations may be performed within current provisions for working hours and rest periods
- Ensuring that the equipment on board is in conformity with the cargo list
- Ensuring compliance with the minimum competence requirements
- Ensuring that a Safe Job Analysis has been performed in accordance with the work specification, cf. Chapter 6 on communication requirements in connection with anchor handling and towing operations
- Inspecting equipment recovered from sea (visual inspection of technical condition)
- Registering newly-installed equipment pursuant to the work specification.
- Ensuring that crew are using PPE and lifesaving appliances
- Having sufficient bunkers for the planned operation
- Having the necessary towing and anchoring equipment

3.1.4 Rig move meeting

The operating company shall issue invitations to a rig move meeting, if possible, approximately two weeks before the operation starts. The work specification shall be distributed approx. one week before the meeting, if possible. This meeting is intended to identify any needs in connection with:

- Anchor-handling equipment
- Navigation and positioning
- Pre- inspection of materials
- Selection of components

The following should attend the rig move meeting:

- OIM (preferably the one who will be on board during the operation)
- Representative from owner installation's operations department
- Onshore drilling supervisor for operating company
- Onshore logistics manager operating company
- Person responsible for positioning operating company/contractor
- Representative from operating company's marine operations group
- Captain on vessel if relevant (for special jobs)
- Equipment supplier if relevant (chains, wires, etc.)
- Warranty surveyor if relevant
- Representative from owner/operator of pipeline/other installation if relevant.

The rig move meeting should normally have the following agenda:

- Review of HAZOP for anchor handling in the field, if one has been prepared (in particular for fields with pipelines) and transfer of experience.
- Requirements to securing anchors and the like above seabed installations.
- Weather limitations and definition of operational criteria.
- Charts.
- Area inspection with ROV.
- Anchoring analysis, anchor pattern and work specification (scope of work).
- Pre-installation of anchor.
- Vessel requirements; quantity and technical specifications.
- Drawings and sketches of anchoring equipment in the sea.
- Manning on installation.
- Manning on boats.
- Safe job input for AHTS and installation.
- Schedules and drilling operation.
- Equipment lists for each AHTS
- Sea bed conditions.
- Communication lines (VHF channels, telephone nos.).
- Stand-by.
- Port of mobilisation.

3.2 Executing the anchor-handling operation

Anchor handling shall be executed in accordance with the work specification. The OIM has the authority to make the necessary changes to the work specification. Significant changes shall be verified by the operating company. All changes shall be logged.

3.3 Towing operation requirements

The following responsibilities apply to towing operations:

- The operating company is responsible for ensuring that the entire towing operation for the contracted installation has been well planned.
- The owner of the installation, represented by the OIM, is responsible for planning and securing the necessary approvals for the towing operation.
- A voyage plan shall be prepared by the appointed vessel (leading tug) and be coordinated with the installation.
- If more than one vessel will be towing, the offshore installation manager shall appoint a leading tug.
- The Master on the leading tug is responsible for navigation of the towing operation.

SWL for the towing equipment on the installation must be taken into consideration. Correct use of tension control on the vessel will make this easier to handle. Important factors that shall be taken into consideration during the towing operation:

- The size of the object towed: length, width, and draft
- General conditions such as seaworthiness and stability.

3.3.1 General towing rules:

- Heavy dynamic tension should be avoided. Adjusted tension on towing winch must be used and assessed carefully in accordance with current weather conditions.
- Changes in towing speed shall be done in a controlled manner.
- When heaving in or paying out the towline, the engine thrust shall be reduced correspondingly to avoid damage to the towline.
- Avoid quick and major changes in heading. If the heading is changed, one must ensure sufficient room for the intended manoeuvre and take into consideration any other tows in progress in the same area.
- Maintain focus on the use of tension control in relation to SWL on the bridle.

3.3.2 Planning the towing operation

See Chapter 3.1 for details regarding the responsibility for planning towing operations.

The sailing plan for the tow shall be planned carefully by the leading tug in cooperation with the installation with regard to water depth, offshore installations, subsea installations and possibilities for emergency anchorage.

Keep a safe distance from any offshore installations; preferably five nautical miles in the open sea. Pass on the optimal side in relation to environmental forces; i.e. the side where the tow will drift away from the installation in case of a black-out or if the towline breaks.

Weather reports shall be obtained regularly. The weather criteria and necessary weather window for the tow shall be defined.

The need for support vessels shall be evaluated.

The following applies with regard to the use of any support vessels along the towing route for traffic control and assistance through trafficked waters. (The installation's standby vessel may be used as a support vessel, if available, or an anchor handling vessel that will in any case follow the tow to the next location.) If a support vessel is used, its tasks should include, but not be limited to:

- Monitoring and plotting all ship traffic along the towing route.
- Intercepting any vessel that moves too close to the tow.
- Checking that the new location is clear and free of permanent fishing gear before the installation arrives.
- Functioning as a back-up towing vessel, if the vessel is rigged for this type of job.
- Handling tasks that the standby vessel would normally handle during a normal operation.

The following shall be prepared before connecting the installation's towing gear to the vessel:

- Description of capacity of bridle and weak link
- Description and dimension of end termination of the installation's equipment
- Communication lines shall be specified (UHF/VHF/mobile telephone)
- For towing vessel requirements, see Chapter 4.7.

3.3.2.1 Catenary and towline tension curves

The following applies to catenary and towline tension curves:

- Take extra precaution and carefully watch the dynamic forces when towing in adverse weather. The length of towline paid out may be critical to the tension the towline can handle. Take extra precaution when towing along with the weather and swell.
- The length of the towline is critical to its elasticity and ability to absorb dynamic forces. The longer the towline, the greater its capacity to handle dynamic tension. Water depth and other water-related circumstances will also determine the length of the tow.
- For longer ocean-going tows the length of the towline should be as long as possible, i.e. approximately 1200-1400 metres or longer.
- Calculation models (with spreadsheet and tables) should be prepared for towline catenary.

3.3.3 Towing operation

Reference is made to Chapter 3.1 for details regarding responsibility for execution of the tow.

When moving installations, all relevant bodies must be notified, see Chapter 3.1.4.

Towing vessels must issue navigational warnings at specified intervals (1 hr.)

3.4 Reporting

The owner of the installation must ensure that the following reporting is done immediately after anchoring up. This reporting shall be done in cooperation with and involve the vessels:

- Issue notification of arrival to defined recipients when the first anchor is on the bottom
- Prepare an overview of equipment used (including rental equipment)
- Report near misses and incidents
- Report any damaged equipment and its condition (also rental equipment), see also Chapter 4.4
- Prepare a manifest of equipment returned to land.
- Upon departure, notify defined recipients of when the last anchor is on the bolster, if required that a tight tow has been started.

4 VESSEL, INSTALLATION AND EQUIPMENT

4.1 Permanent chaser pendant (PCP) requirements

4.1.1 In general

It should be possible to link PCP to shark jaw by the use of a chain tail or socket. The chain tail is used in case of major tensions and/or risk of twist in PCP.

When deliver/receive of anchor pendant from/to installation, all other ongoing operations should cease as it may affect the position of the installation.

It must be possible to lower the anchor in a controlled manner from the anchor bolster by the use of the installation's anchor winch.

The swivel should only be attached to the working wire.

4.1.2 Requirements to components

The PCP shall be designed and used so that it will have enough strength to break loose an anchor from the seabed under all conditions.

The length of the chain tail shall be adapted so that the anchor may hang behind the stern roller of the AHTS at the same time as there is good working length to fasten the chain tail to the shark jaw of the AHTS. (12M)

The total length of the PCP (including the chain tail should be 72 m) shall be such that a safe transfer and link-up to the PCP and the AHT may be performed in all weather conditions in which it is safe to perform anchoring operations. For DP installations classified in DP Class 3 or the equivalent, in which the thrusters may come into conflict with a hooked off PCP, or where hooking off the PCP would expose the crew on board the installation to new risk elements owing to the need for extra PCP mountings, the total length of the PCP (including the chain tail) shall be defined through a rig-specific risk analysis performed in cooperation with the parties involved.

For recommendations for part components, see Figure 1: "Example rig pennant-wire system with stevpris anchor" and Figure 2: "Mooring chain arrangement".

Shackles between chain tail and chaser:

- Minimum requirement is 120 tonnes.

Chain tail between chaser and pendant wire:

- Minimum requirement is ORQ and a 400-tonne breaking load
- Minimum length 12 metres
- Dimension 76 mm (3")
- There shall be an open common link at both ends. These may be produced as open common links. Modification of chain links with stake is not permitted.
- Kenter between chain tail and pendant wire

Pendant wire:

- Eye towards chaser can only be a PeeWee/CR socket
- The wire shall be a minimum of 76 mm (3")
- Possibility for connecting a minimum 76 mm (3") kenter link
- The length of the pendant wire shall be 60 metres (200')

Eye towards vessel/shark jaw:

- Use a PeeWee/CR socket with an option for connecting a minimum 76 mm (3") kenter link. It is recommended that a 76 mm (3") chain tail is connected as shown below, to ensure that the chain tail is grabbed by the shark jaw on board to avoid damage to the pendant wire.

Chain tail in the end of the pendant wire:

- The length must consist of a kenter link (towards the pennant) with a minimum of four links + open common link in the end.
- Open common links must be produced as open common links. No modification of chain links is permitted.
- The whole chain tail may consist of open common links.
- Minimum ORQ quality and 400 tonnes breaking load
- Minimum dimension is 76 mm (3")

Figure 1: Example rig pendant-wire system with stevpris anchor

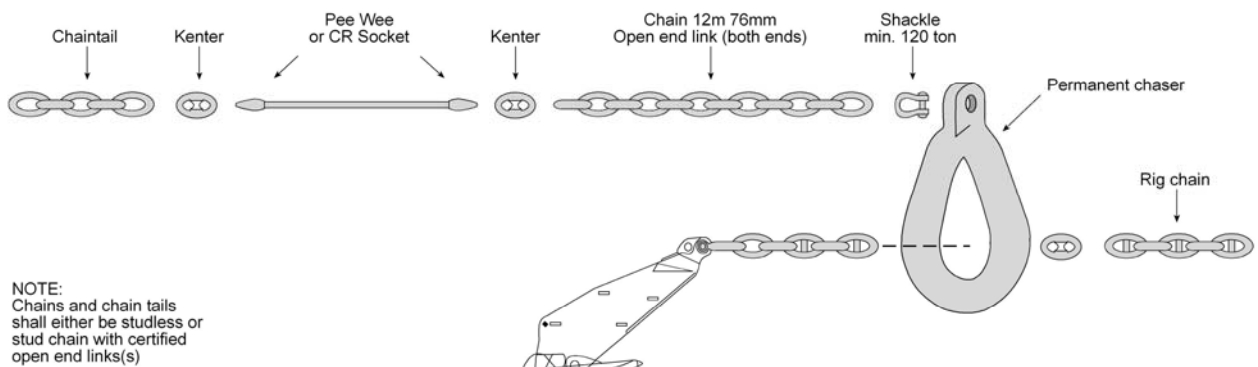
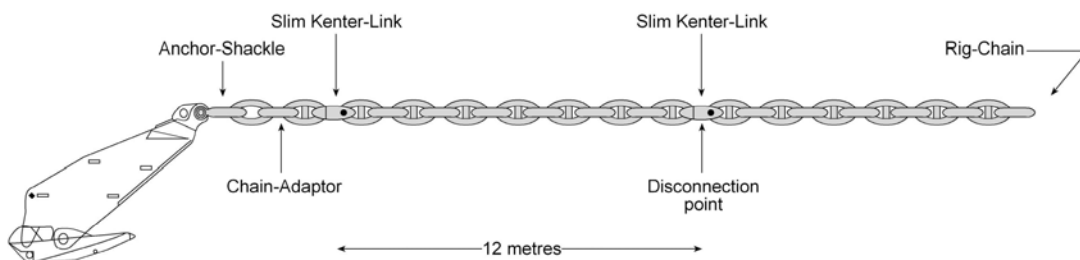


Figure 2: Mooring chain arrangement



4.2 Buoy and pennant buoy system

4.2.1 In general

The recommended length of the entire system (from piggyback to pigtail) should be 120% of water depth – at least water depth plus 60 metres.

The pennant wire should be one length and be reeled on board in case of mobilisation.

Recommendations for components in the system appear from item 4.2.2, see Figure 3 “Example pennant/buoy system”.

4.2.2 Buoy and pennant system

Surface buoys:

- Must be designed so that they cannot roll.
- Must be equipped with radar reflector and yellow light (preferably diode light).
- The buoy should be yellow and be marked with owner and ID number.
- The buoys should be marked with net buoyancy.
- A 110 tonne shackle is used between the buoy and the pigtail
- A 110 tonne shackle or kenter is used between pigtail and pennant.
- Nuts in shackles to be secured by rustproof bolts or split pins.

Kenter link:

- As a minimum ORQ quality and 76 mm (3").

Pennant wire for buoy:

- To be marked with colour code (e.g. on talurite base) based on length, see item 4.2.3
- Should have a soft eye or PeeWee/CR socket with chain tail on four chain links and common open link in 76 mm (3") in both ends.
- Link up between pennant wires and between pennant and the anchor chain to be made with kenter link.

Chain tail on anchor - may be piggyback or primary anchor, but in case of piggyback the following applies:

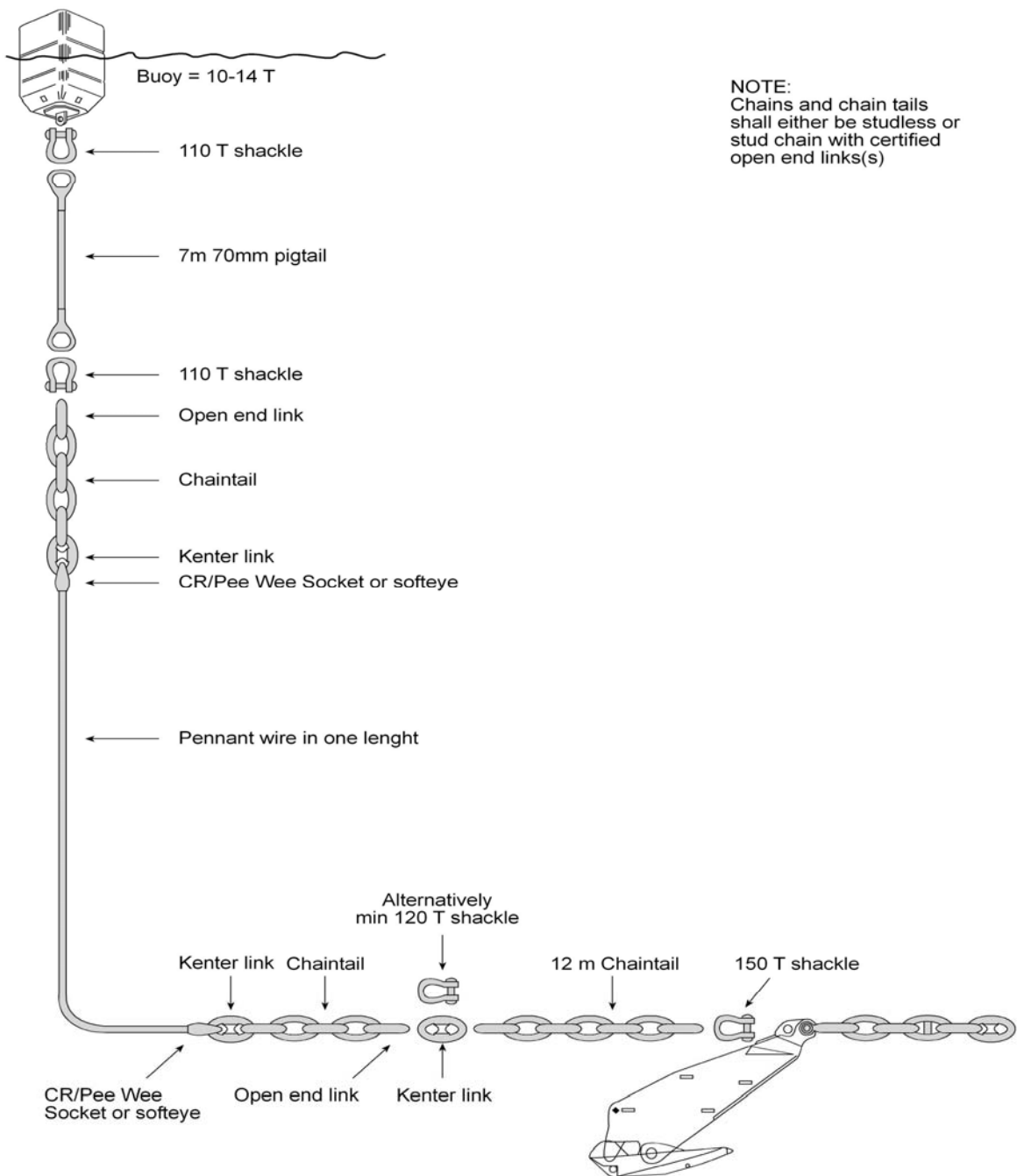
- 12-metre chain tail at both ends (towards primary anchor and towards buoy/piggyback)
- Chain tail minimum 76 mm (3").
- Minimum ORQ and a breaking load of 400 tonnes
- Open common link at both ends
- Lifting yoke for the piggyback shall follow the piggyback anchor.

It is possible to replace a kenter link in the system with a 120-tonne shackle as long as the shackle is placed so that it cannot come near the anchor-handling vessel.

Sub-surface buoys:

- Must be designed so that they will not roll.
- Must be yellow and marked with owner and ID number
- Must be marked with the letters SSB (Sub Surface Buoy) on all sides
- The buoys should be marked with net buoyancy.
- Nuts in any shackles to be secured by rustproof bolts.
- The linking device for connecting buoy to anchor line is supplied with tools for simple and quick link-up. The linking device must handle wire/fibre rotation.

Figure 3: Example pennant/buy system



4.2.3 Pennant wire colour codes

The following colour codes must be used on the socket to identify the length of the pennant wire

180 metres (600 ft.)	Orange
150 metres (500 ft.)	Blue
130 metres (400 ft.)	Green
90 metres (300 ft.)	Red
60 metres (200 ft.)	Yellow

4.3 Vessel working wire/chaser requirements

- A swivel must be used in the working wire to prevent the wire spinning. It should be capable of handling 7000 kN and be of a concave type
- A PeeWee/CR socket is recommended for the working wire
- The minimum thickness of the working wire should be in proportion to the winch (breaking load 300 tonnes)
- A pear link of an approved make must be used
- The correct wire length in relation to the water depth shall be used, i.e. 1 ½ times the water depth
- It is necessary to follow up new swivel designs being developed and to qualify these for use in working wires.
- As part of the anchor-handling tug vessels' standard equipment, the end of the winch' working wire must be equipped as follows:
 - The wires shall have socket termination
 - Swivel with ball bearing 7000kN
 - Coupling element of pendant wire must be an open-end link
 - There must be flexibility in the system so that it may be turned for linking to the installation's equipment
 - All components in the system must be certified

4.4 Materials, certification and documentation of leased equipment

Leased equipment must be satisfactorily marked and documented. The documentation must include certificates, status reports and history.

The person/organisation renting the equipment is responsible for ensuring that the supplier has complied with all requirements.

Kenter shackles and swivels must be greased and function tested.

Shackles components must be forged.

Chasers are supplied with a certificate and material documentation showing heat treatment and the ductility of the material. Repairs shall only be carried out in conformity with qualified procedures with focus on heat treatment after repairs have been made.

4.5 Piggyback systems

The wire between the piggyback anchor and primary anchor shall have a breaking load of a minimum of 70 % of the holding tension of the primary anchor. The wire between the piggyback and primary anchor shall be fastened to pad eye or bridle. The piggyback anchor shall be adapted to the sea bottom conditions based on the site survey.

4.6 Installation and equipment

If technologically possible, one should be able to hook the PCP on/off the installation without manual intervention.

The installation's anchor lines should be designed so as to allow for replacement of elements in a safe manner offshore.

When replacing an element in the anchor line, the coupling point shall reach 70 meters beyond the fairlead.

4.7 Vessel and equipment

The vessel shall normally be equipped with a camera to allow for observing from the bridge the pull and status of towing wire/working wire over the stern roller.

It must be possible to observe the status of the wire reeled on/off the winch. Camera surveillance must be installed if visual observation is not practical/possible.

One of the vessel's tugger winches should have fibre ropes.

4.8 Pre-installation of anchor

4.8.1 In general

The pre-installation of anchor is most often done to reduce the risk of damage to the "infrastructure of the seabed" and the environment compared to installing the anchors in the usual manner. It may be necessary because of a lack of space and the risk of coming into close contact with existing or planned seabed installations. Under given circumstances, pre-installation of anchor may be time-saving as regards time on the rig during actual anchoring.

4.8.2 Factors that should be assessed in connection with pre-installation

- Expected tension on the lines based on anchoring analyses to the rigs that are to be anchored.
- Necessary retaining power of anchors, based on anchorage analysis
- Choice of anchor type based on analyses of seabed data and

- requirements to retaining power for the relevant rigs.
- Required test tension and choice of method for performing this.
- Choice of chain dimensions and lengths between anchor and connecting point on the rig.
- Use of VLA (Vertical Load Anchor).
- Assessment of type of inserted elements; fibre lines or wire.
- Method for link-up, for example:
 - Are there possibilities for laying a grapple wire on the bottom
 - Must the link-up be picked up by a ROV, or
 - Can the pre-installed anchor be buoyed off with surface buoys (weather conditions must be assessed).
- Procedure for relevant anchor type.
- Reporting to the authorities and fishery organisations of the installation.
- Anchor handling, technical requirements of the vessel:
 - Winch capacity; size of roller and tractive pull
 - Gypsy dimensions based on chain dimensions which are included
 - Requirement to bollard pull based on required pre-tensioning
 - Required wire/chain lengths in relation to water depth for pre-tensioning
 - Navigation services on vessel
 - Requirement to divided stern roller

5 WORK SPECIFICATION

A work specification shall be prepared that provides the necessary background information on the anchor handling/towing operation and describing the operation at the required level of detail. The purpose of the work specification is as follows:

- To ensure a safe operation for personnel, the environment and values
- To provide common guidelines for standardising the relocation of the installation and anchor handling
- To provide a brief outline of the topics to be covered
- To describe the framework conditions without getting wordy
- To be used during planning, mobilisation, execution, verification and demobilisation during relocation of the AHTS/installation

Deviation from the work specification is permitted by cooperation of the parties involved in the operation. Reference is also made in general to OLF's guidelines for acceptance criteria for offshore service vessels. The work specification shall normally only be prepared in English.

A summary (of approximately one page) should be prepared, to be forwarded to the vessels as soon as they are know, so that they will be informed of the main aspects of the rig relocation before mobilisation.

5.1 Contents of work specification

The work specification shall have an introduction that describes its purpose in accordance with the items listed above. The description shall be based on a step-by-step approach with four phases:

mobilisation/loading, hoisting anchor, transit, setting anchor. The work specification should contain the following information:

5.1.1 General information

- Weather window and weather criteria
- Time estimate for the different phases of the rig relocation.
- Requirements to AHV's (number, winches, working wires, etc. See item 5.2)
- Marking AH equipment and use of manifest
- Weather reports
- Communications (VHF & UHF, and tel. nos. to rig, vessels, base, etc).
- Navigation system
- Emergency anchors
- Safe job analysis and rest period regulations
- Etc.

5.1.2 Information about installation

- Main data (type, year of construction, length, width, etc)
- Anchoring system (number of lines, chain/wire type and length, anchor type/weight etc).
- 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 of installation)
- Draft of installation at anchor handling (transit draft/operational draft, survival draft).
- Telephone numbers (vessels and installation)

5.1.3 Field information (for both locations)

- Position, water depth, and sea bottom conditions
- Infrastructure (pipelines, templates...)
- A minimum of field-specific requirements (such as simultaneous operations, buoyancy buoys, moorings, pre-positioned equipment/arrangements, changes in anchor lines). Detailed charts and general course map from the operator should be attached.

5.1.4 Mobilisation and equipment lists for AH equipment

- Mobilisation port – base.
- Detailed equipment lists/manifest for all AH equipment (at ID level)

5.1.5 Raising anchor on departure and transits

- Preparations as required (debuoying)
- Sequence descriptions
- Sequence drawings
- Towing configuration.

5.1.6 *Dropping anchor on arrival new location*

- Sequence descriptions
- Sequence drawings
- Pre and final tension
- Any catenary curves for current water depth in case of different tension

5.1.7 *Attachments to work specification*

The work specification should contain attachments with supplementary information and drawings on:

- The rig's anchoring system and towing gear.
- Any equipment to be inserted in the anchor lines.

5.2 *Requirements related to relevant vessels*

The work specification shall define the requirements to AH vessels and AH equipment. The requirements must coincide with the operator's requirements:

- Bollard pull
- Tug and working wire (number, dimension)
- Winch capacity (pull, drum capacity, diameter and number of drums)
- Gypsies, number and dimensions
- Chain lockers, number and capacity
- Secondary winches, number and capacity (number of metres 76 mm chain)
- Guide pins/shark jaws (minimum 2 each)
- Requirements related to wire terminations (see Chapter 4.3 for further details)
- Stern roller: single or double for special needs
- System for removal of clay
- Spooling gear
- Minimum freeboard requirement for safety on deck
- Requirements related to crane on aft-deck for handling of equipment

Attachment: "Model work specification in pfd format, with example of step drawing".

6 COMMUNICATION REQUIREMENTS DURING ANCHOR HANDLING AND TOWING OPERATIONS

Good communication during the planning and execution phases of the anchor handling and towing operations is a precondition for a safe operation. Reference is made to communication in Chapter 3.3 of OLF's Guidelines for Safe Operation of Offshore Service Vessels.

- VHF output power: 1 watt
- There is to be UHF communication between the crane operator and vessel deck during the operation. In the event UHF is not used, one of the seamen shall have VHF if the crane uses VHF.

- Before the operation is initiated, a Safe Job Analysis shall be prepared or there shall be a dialogue between the parties involved (crane/vessel), see Chapter 7.

7 SAFE JOB ANALYSES FOR ANCHOR HANDLING AND TOWING

The installation and vessel shall perform a Safe Job Analysis (SJA) before the anchor handling operation starts. If there is a change in the operation originally planned, and which was covered by an SJA before the operation started, it is important that the hazards of the changed operation are reviewed by the personnel involved. This requires a time-out and a review with the personnel involved. This review is carried out at the place of work using the established communication system on board the vessel. In contrast to an SJA, a time-out requires no fixed agenda, nor will it be necessary for the participants to sign out. Changes to the operation after the completed time-out are documented in the deck log. Reference is made to Chapter 9.8 of OLF's Guidelines for Safe Operation of Offshore Service Vessels for further details.

8. COMPETENCE AND MANNING REQUIREMENTS FOR ANCHOR HANDLING AND TOWING OPERATIONS

The competence requirements are stipulated in OLF/NSA 061 Guidelines for Safe Operation of Offshore Service Vessels.

The crew of the vessel should be adapted to the vessel's construction, equipment and function in the petroleum industry. It is presumed that current provisions relating to working hours and resting periods are observed at any time.

With today's technical solutions, this normally means that the vessel must be manned with 4 navigators (including the captain) and 5 persons on deck, of which 1 may be an apprentice (2nd year apprentice).