

## **10. OPERATIONS**

### **10.1 GENERAL**

#### ***10.1.1 RESPONSIBILITIES***

10.1.1 The Master is responsible for the safety of the vessel, its equipment and crew. He is also responsible for the safe operation of the vessel and should question any instructions or directions that he feels may compromise safety.

10.1.1.2 The OIM is responsible for the installation and operations within the 500 metre zone.

#### ***10.1.2 MASTER/OFFSHORE INSTALLATIONS-MANAGER INFORMATION EXCHANGE AND COMMUNICATIONS***

10.1.2.1 Prior to commencing cargo operations offshore, the program should be discussed and agreed by radio between the OIM and Master, or their appointed deputies, to ensure that the installation and vessel are ready in all respects. The Master must be advised of any anticipated helicopter movements during the expected duration of the cargo operations.

10.1.2.2 Any factors limiting the vessel's expected performance before or during operations should be indicated to the installation, and the vessel's Master should, in turn, be given information on limitations of the installation which may affect the operation.

10.1.2.3 Installations and vessels should have in place operating procedures designed to assist operations. A suggested checklist for vessel/installation is contained in Appendix A.

10.1.2.4 Effective communications between the Master, the installation staff, particularly the crane operator, the deck officer in charge on the vessel and the deck crew are vital for safety. Communications should be conducted only in the English language and for this reason adequate numbers of key personnel should be proficient in English. An effective radio communication link on a dedicated channel must be maintained at all times whilst the vessel is engaged in cargo operations.

#### ***10.1.3 STABILITY***

10.1.3.1 It is the responsibility of the Master to ensure that the vessel always has adequate stability and at least complies with the minimum requirements of the international conventions at all stages of operations.

10.1.3.2 Regard shall be taken of the possible reduction of stability due to the retention of water in pipe cargoes, heeling effects of a tow-wire under load, discharge of bottom weight at sea or any other factor that may impinge on the stability of the vessel.

10.1.3.3 The Master has the authority to cease or modify an operation if he is of the opinion that it may compromise the stability of the vessel to the extent that the minimum requirements cannot be met at all times.

#### **10.1.4 DECK LIGHTING**

Deck lighting should always be adequate to conduct operations in a safe and efficient manner.

### **10.2 CARGO OPERATIONS**

#### **10.2.1 ORDER OF STOWAGE**

10.2.1.1 Where practicable the order of loading, discharging and stowage arrangements should be pre-planned in order to avoid the "slotting in of containers" and the necessity for any person to climb on top of cargo.

10.2.1.2 The Master should be provided with details of any unusual items of cargo, cargoes requiring special securing arrangements, or heavy lifts, before loading.

10.2.1.3 During backloading at an installation, the deck crew should stand well clear and allow the crane driver to place the cargo on deck before approaching the lift to disconnect the crane. In special circumstances, and with special items of cargo, the deck crew may assist with the placing of lifts, after all relevant factors have been taken into account and safe procedures established and with the agreement of the Master and crew members concerned.

#### **10.2.2 DOCUMENTATION AND MARKING**

10.2.2.1 All cargo should be accompanied by a cargo manifest clearly identifying the goods and giving details regarding the contents, destination, general dimensions and weight. If the Master of the vessel is unable to obtain full details of cargo on the ship prior to loading at any port or backloading at an installation, an outline list giving brief details must be drawn up to the Master's satisfaction, before loading is permitted to commence.

10.2.2.2 All dangerous cargoes must be declared to the Master and AMSA in accordance with Marine Orders Part 41, whether bound from shore to installation or vice versa.

10.2.2.3 Where shipment of dangerous cargoes are routine, special arrangements may be agreed with AMSA, but Masters must be fully informed of the cargoes to be carried.

10.2.2.4 All cargo must be marked so as to be readily identifiable from the manifest or outline list.

10.2.2.5 Containers should have their identification numbers clearly marked on the top so that the crane driver and bridge officer can easily identify each container.

10.2.2.6 The Master has the authority to refuse cargo if insufficient information is given, the cargo is incorrectly manifested, or if he has reason to believe that dangerous goods are contained in unmarked cargo.

10.2.2.7 The description and mass of loaded containers must be individually declared on the manifest. Operators should provide facilities at the shore base to verify masses during loading operations. Where weighing facilities are not available, offshore installation personnel should be careful not to underestimate the mass of individual lifts.

### **10.2.3 LASHING AND SECURING/RESTRAINING OF CARGO**

- 10.2.3.1 Cargo must always be secured. Restraints should be in position before the vessel sails, and should remain in position until immediately before each item is offloaded.
- 10.2.3.2 Restraining bonds/lashings should be rigged so as to prevent initial movement.
- 10.2.3.3 When determining the type and extent of restraining arrangements required, the Master should take into account the following:
  - the motion characteristics of the ship
  - the anticipated weather
  - the freeboard
  - the nature of cargo
  - the number of installations to be worked

### **10.2.4 DECK CARGO**

- 10.2.4.1 All deck cargo must be stowed to the satisfaction of the Master. The Master is responsible for ensuring it is correctly stowed and adequately secured for the intended voyage.
- 10.2.4.2 Areas on the deck which are not to be used for cargo stowage must be clearly marked or otherwise indicated. An adequate area for handling mooring lines must be left clear of cargo at the stern of the vessel if the vessel is securing to the installation.
- 10.2.4.3 Where fitted, pipe posts to restrain the movement of tubulars should be used. A supply of large soft wood wedges is also useful for temporarily restraining tubulars between lifts or while installing lashings.
- 10.2.4.4 All cargo operations, on and off shore, must be supervised at all times by the deck officer in charge on the vessel.
- 10.2.4.5 The Master has the authority to decide the sequence of cargo discharge to, and backloading from, the installation.
- 10.2.4.6 In bad weather and under certain conditions of trim, considerable amounts of water may be shipped over the after deck when a vessel is approaching a rig stern-on under power. Crew members should be aware of, and alert to, this possibility and seek positions of shelter and safety.

### **10.2.5 PERSONAL PROTECTIVE EQUIPMENT**

- 10.2.5.1 The appropriate personal protective equipment must be worn during cargo handling operations by the crew of a support vessel and by the quayside and installation personnel. This should include but need not be limited to:
  - Coveralls
  - Safety boots
  - Gloves
  - Safety helmets complete with chinstraps
  - High visibility work vest
  - Safety glasses (including sun glasses for high glare conditions)

Sun cream (high UV protection)

10.2.5.2 In addition, approved buoyancy aids along with suitable wet and cold weather clothing must be available.

### **10.2.6 PRE-PLANNING**

10.2.6.1 Cargo pre-planning should be conducted both at the shore terminals and offshore. Pre-planning aids effective cargo securing practices. The objective of pre-planning is the safe and practical restraint of cargo carried on the deck of offshore support vessels whereby personnel, ship and cargo may be reasonably protected at all stages of carriage, and during cargo operations offshore.

10.2.6.2 It is essential therefore that liaison is established between the installation and the Master prior to unloading or backloading of cargo.

10.2.6.3 The Master of the vessel must be advised of expected delays to operations so that the vessel's work programme may be synchronized with that of the installation.

10.2.6.4 Excessive close standby/waiting time alongside the installation should be avoided.

### **10.2.7 DANGEROUS GOODS AND MARINE POLLUTANTS**

10.2.7.1 The carriage of dangerous goods and marine pollutants is governed by Marine Orders (Parts 41, 91, 92, 93, 94), the International Maritime Dangerous Goods Code (IMDG Code) and the provisions of various other State and Commonwealth Acts concerning pollution and the protection of the environment as well as health and safety.

10.2.7.2 Masters of vessels, and operators and owners of offshore installations must have available appropriate extracts of IMDG volumes for reference. All requirements laid down in the IMDG Code must be followed, where applicable.

10.2.7.3 Operators and owners of offshore installations, in their capacity as shippers, must ensure that all dangerous goods and marine pollutants are properly declared, packaged and marked in accordance with the IMDG Code. Masters of vessels must ensure that all such goods and pollutants are properly stowed, secured and segregated in accordance with the IMDG Code.

10.2.7.4 Masters must be given advance notification prior to the loading or backloading of dangerous goods. A written declaration in the form of a Dangerous Goods Note must be delivered to the Master before the goods are taken on board.

10.2.7.5 A dangerous goods packing certificate is required for all dangerous cargo or marine pollutants packed into containers, and cargo of this nature must be stowed and segregated in accordance with the IMDG Code. This is equally applicable to offshore backloading.

10.2.7.6 All portable tanks used to carry dangerous and polluting substances must be approved for use by a competent authority, and tested and marked in accordance with the IMDG Code. Prior to being placed on board a vessel, all tanks must be carefully checked for damage and leakage.

10.2.7.7 The Master should consult with the shipper/operator when in any doubt regarding shipping of dangerous goods and marine pollutants, and he has the authority to refuse to load these cargoes if the regulations are not being correctly observed.

### **10.2.8 *INSTALLATION OVERBOARD DISCHARGES***

All non-essential overboard discharges that could hamper safe vessel operations alongside should be shut down prior to commencing cargo operations. Should the Master consider that an overboard discharge may cause distress or danger to personnel or to the vessel, he has the authority to cease operations and stand off, until the discharge has ceased or prevailing conditions keep the discharge clear of the vessel.

### **10.2.9 *INSTALLATION AND COLUMN LIGHTING***

In some cases, lighting below platforms and around columns is of a low standard. Where the Master of the vessel does not have a clear view of the overall operation or the installation structure, operations should be restricted to daylight hours or until full visibility has been restored. In certain circumstances, the vessel's own searchlight may be utilised.

## **10.3 PROCEDURES AT THE INSTALLATION**

### **10.3.1 *CARGO OPERATIONS***

10.3.1.1 Cargo operations while discharging all liquids, cargo and bulk to offshore installations, must be undertaken in a safe and efficient manner. In recognising this fact, the following points must be considered:

10.3.1.2 Pre-arrival considerations:

- that the ship can approach the installation safely;
- that there are no divers, ROVs etc in the water;
- that the weather/tide/current/sea and swell conditions are suitable;
- the type, weight and number of units to load or discharge;
- the existing cargo on deck;
- if there is sufficient space on deck to allow safe access to and from the area of work;
- that all engine/steering/thrusters/joystick controls have been checked and are fully operational and the main engine pitch control is fully operational;
- redundancy of essential machinery;
- vessel's electrical load must be carried by auxiliary alternators and is not totally reliant on shaft alternators; and
- hose connection points on the vessel are in good order.

10.3.1.3 Before proceeding with the cargo operation the Master must satisfy himself that:

- all emergency pump stops are operational;
- the vessel is able to remain on location in the prevailing weather and sea conditions;

consideration has been given to the trim of the vessel during progressive loading/discharging.

the hoses and cargo lifting arrangements are in good order; and

constant communication is maintained with the person on the platform responsible for supervising the transfer of hoses and receiving of bulk/liquids or cargo.

- 10.3.1.4 The vessel must advise the offshore installation of the following:
- maximum pumping rate;
  - emergency stop procedure;
  - notice required to stop bulk transfer under normal conditions; and
  - draining back procedure.

- 10.3.1.5 The platform must advise the vessel of the following:
- size of hose connection;
  - length of hose available;
  - maximum rate at which bulk/liquids can be received;
  - order of receiving bulk/liquids; and
  - maximum back pressure that the platform pipe system can withstand.

- 10.3.1.6 The platform should ensure that a crane driver is available at all times to lift disconnected hoses at short notice.

10.3.1.7 **LIVE BOATING**

While live boating at the offshore installation:

- an engineer is to be available at all times;

- two seafarers are to be available on deck at all times while pumping bulk/liquids, so that disconnection of hoses can take place at short notice.

10.3.1.8 **SECURING TO THE INSTALLATION**

- 10.3.1.8.1 Crews should be made aware of the hazards involved with handling large mooring lines in the confined spaces normally available at the stern of a support vessel.

- 10.3.1.8.2 Cargo should not encroach on the area that is needed for the crew to operate the mooring capstans and to make the vessel fast safely. If it is necessary for a particular reason to carry deck cargo in the area that the crew require for mooring activities, such cargo should be discharged to the installation before the vessel is moored.

**10.3.2 BACKLOADING OF CARGO OFFSHORE**

- 10.3.2.1 All backloading operations should be pre-planned to assist safe operations. Offloading from, and backloading into, slots should be strongly discouraged unless the Master deems it to be safe.

- 10.3.2.2 All tubular backloads should be indicated to the vessel in good time to allow for planning of stowage. Tubular cargoes should be pre-slung in bundles or singly and secured by bulldog grips or other equivalent methods to prevent slippage. All pipe lifts should be slung so as to be level. Varying lengths of sling in one lift should not

be used. Taglines should be provided as required to increase overall safety when landing cargo on the vessel's deck.

- 10.3.2.3 All cargo to be backloaded should be inspected by a responsible person on the installation to ensure that it is in a safe and secure condition and will not create a hazard to the crew or vessel, i.e:
- that there are no loose items on top of or inside the cargo
  - that the cargo is properly slung
  - that all doors, lids etc. are properly secured
  - that open skips or cargo baskets are fitted with nets or covers.
- 10.3.2.4 Open skips/baskets should be drained of loose water prior to offloading from or backloading to the vessel.
- 10.3.2.5 Machinery oil drip trays shall be emptied and cleaned prior to backloading onto a vessel.
- 10.3.2.6 Installation personnel must remove dangerous cargo labels on empty cleaned containers prior to backloading to the vessel. Dangerous cargo labels must not be removed from empty uncleaned containers.

### **10.3.3 HELICOPTER OPERATIONS**

The Master must be notified well in advance of all expected helicopter operations on the installation, so that cargo work may be safely suspended.

### **10.3.4 CRANE OPERATIONS**

- 10.3.4.1 In all cargo work involving crane operations, whether in port or offshore, the crane driver should have a clear view of the vessel's deck, and should be stationed in a safe place. In exceptional situations, where the crane driver cannot see the vessel's deck, then a 'dogman' who does have a clear view of the deck should be appointed.
- 10.3.4.2 For offshore crane operations a safety pendant ('Stinger') of sufficient length should be provided between either the headache ball or floating block and the hook, all of which should be of high visibility colour.
- 10.3.4.3 For routine cargo operations offshore, only swivel self-locking safety hooks should be used. For non-routine cargo, alternative hooks or lifting gear as agreed between the Master and OIM may be used, providing that such equipment is fit for the purpose.
- 10.3.4.4 The crane driver offshore should have direct radio communication to the bridge of the vessel.
- 10.3.4.5 Directions given to the crane driver by the deck crew on the vessel must only be given by one person who has been designated to perform that function.
- 10.3.4.6 The working limitations of the crane should be formally passed to the Master of the vessel prior to operations commencing, using a check list system as outlined in Appendix A.
- 10.3.4.7 All heavy lift cargo should be indicated to the installation/vessel, using a checklist system as outlined in Appendix A.

- 10.3.4.8 All operations involving heavy lifts require suitable weather criteria which should be discussed and agreed prior to commencement. Other operations, bulk handling etc., may have to be suspended whilst heavy lifts are handled. Subject to agreement with the Master, taglines should be attached to heavy or large lifts, when considered necessary to aid handling.
- 10.3.4.9 Due account must be taken of impact loadings caused by the vertical movement of the craft in the swell when the weight of the cargo is taken by the crane.
- 10.3.4.10 When planning the loading ashore, containers and pre-slinging arrangements should be suitably de-rated to take account of the expected sea conditions during discharge at the offshore terminal.
- 10.3.4.11 As far as is practicable, all crane lifts made from or onto a supply vessel should not be lifted directly over the vessel if the height of the lift above the vessel exceeds 3 metres inclusive of any swell which may be in existence. Once the height of the lift exceeds 3 metres, the remainder of the lift should be made over water.

### **10.3.5 BULK TRANSFER PROCEDURES**

- 10.3.5.1 Agreed procedures covering the transfer of all bulk products should be followed. See Appendix B for guidelines and sample procedures.
- 10.3.5.2 It is recommended that a checklist procedure be adopted for transfer of fuel or oil products to or from the vessel that is consistent with the provisions of MARPOL and the legislation covering prevention of pollution. See Appendix B for a sample checklist format.

## **10.4 ANCHOR HANDLING AND RIG SHIFTS**

### **10.4.1 GENERAL**

- 10.4.1.1 Handling rig anchors at sea can be a particularly hazardous and arduous task. No formal hard and fast rules can be laid down for anchor handling/towing operations, as so many variable factors apply. Offshore personnel should be aware of the operational limitations of the various vessels utilised, including their power and freeboard, with the safety of crews being of paramount importance. Detailed procedures for each operation are to be found in the ship's Operations Manual.
- 10.4.1.2 Vessel owners have the responsibility for ensuring that vessels involved in anchor handling operations, together with their equipment, are fit for the purpose and adequately manned.
- 10.4.1.3 Offshore installation personnel should ensure that, whenever pendants are passed to vessels close alongside, crane drivers are competent to undertake this operation. The operation should be adequately supervised.
- 10.4.1.4 Any equipment returned to the installation as suspect or unserviceable must not be used or sent back to a vessel for use until it has been repaired, retested and recertified by a proper authority.
- 10.4.1.5 As anchor handling is almost invariably performed over the stern, crew members must be made aware of the hazards associated with seas coming aboard during operations. All precautions possible should be taken to avoid injury from crew

members being washed across the deck by seas coming aboard. The Master has the authority to cease operations if the weather is such that there is a significant risk of injury due to boarding seas.

10.4.1.6 If in attendance, the standby vessel should be informed of all operations in progress.

#### **10.4.2 *AGREED PROCEDURES, WRITTEN PROGRAM, BRIEFING OF MASTERS, RESPONSIBILITIES***

10.4.2.1 Full procedures for rig move operations must be agreed by operators and their Mobile Installation Contractors and clear instructions laid down in writing. Where particular installations have detailed procedures for anchor-handling and towing, these must be passed to the relevant vessels via the operator as required, so that Masters are fully briefed on the operation to be conducted. If possible, Masters should be briefed prior to leaving port or, failing that, on location prior to rig move operations.

10.4.2.2 The procedures must identify the responsibilities of key personnel and identify who is the person in charge of the move.

10.4.2.3 The Master of each vessel is responsible for the maintenance and use of the ship's own equipment.

10.4.2.4 The owner and operator of the installation is responsible for all installation equipment, including equipment hired specifically for the move.

10.4.2.5 There should be agreement as to responsibility for providing mooring equipment for the move and as to the amount and specification of such equipment, taking account of the anticipated holding ground on location.

10.4.2.6 Sufficient piggy back anchors, buoys, associated pendant systems, shackles and other spare gear should be available in the field as required.

#### **10.4.3 *COMMUNICATIONS***

10.4.3.1 Effective communications between the Master, the installation staff and the deck crew are vital for safety. For this reason adequate numbers of key personnel should be proficient in the English language. Only the English language should be used on the radio during operations to avoid hazardous confusion.

10.4.3.2 An effective radio communication link between the vessel and the installation on a nominated channel should be maintained at all times whilst the vessel is engaged in anchor handling and/or towing operations. The channel chosen should be clear of other operations to avoid congestion and delay in issuing instructions.

10.4.3.3 The Master of a vessel engaged in anchor handling operations must be notified of any expected helicopter movements to or from the installation during such operations.

10.4.3.4 The Master should question any instructions or procedures that he feels are not consistent with the capabilities of the vessel, good practice or that may compromise the safety of the vessel, installation or crew.

**10.4.4 PIPELINES, SUB-SEA OBSTRUCTIONS/STRUCTURES**

- 10.4.4.1 All personnel involved must have full details regarding the location of pipelines and sub-sea obstructions/structures relating to the whole operation.
- 10.4.4.2 Where it is known that anchor handling and/or towing operations will be conducted near to pipelines or sub-sea obstructions/structures, then full written procedures should be agreed by all parties.

**10.4.5 CLEAR DECKS**

- 10.4.5.1 Anchor handling vessels should have clear decks prior to commencing anchor handling operations. All cargo and equipment not needed for use during the move should be discharged back to the rig prior to commencing operations.
- 10.4.5.2 Installation deck loads should be pre-planned to ensure that it is not necessary for support vessels to carry cargo or equipment that is not needed for the anchor handling operation.

**10.4.6 REMOVAL OF CLUTTER**

- 10.4.6.1 Equipment, such as buoys, anchors, pennants etc. accumulated on the deck during operations should be discharged back to the installation at regular intervals to avoid the hazards associated with an accumulation of clutter on the working deck of the vessel.
- 10.4.6.2 Installation deck loads should be pre-planned to ensure that there is sufficient space and capacity to allow this excess gear to be returned to the rig.

**10.4.7 CARRIAGE OF SPARE ANCHOR BUOY**

Each vessel engaged in anchor handling operations should carry a spare anchor buoy on deck throughout the work in order that the vessel's work wire can be buoyed off should the need arise, e.g. if the weather deteriorates during anchor running operations and it is not considered prudent to bring the vessel back alongside to recover the chasing pendant, or if the vessel suffers a mechanical breakdown which restricts its ability to manoeuvre safely alongside the rig/installation.

**10.4.8 WINCH DRUM VISIBILITY**

- 10.4.8.1 On all anchor handling vessels it is imperative for safety that the winch driver have a clear view of the winch drum that is being operated. It is preferable that the Master also has a clear view of the drum. Both the Master and winch driver should have a clear view of the working deck.
- 10.4.8.2 On vessels where there are video cameras installed to provide a view of the winch drum, these and the associated lighting must be so positioned so as to give the best view possible. The video system should be maintained so that the winch driver always has a clear view of the drum.
- 10.4.8.3 In an emergency or due to system breakdown it may be necessary to operate the winches using a crew member as an observer at the drum using a radio or hand signals to communicate direct to the winch driver. If this is necessary the observer

should be so placed that he is not in any danger from the winch or the equipment being wound on/off. Hand signals should be agreed prior to the operation and all personnel fully briefed as to requirements.

#### **10.4.9 PERSONNEL CLEAR OF DECK IN PROTECTED AREA**

10.4.9.1 All personnel should be clear of the deck, and in a protected place at all times, except when they are actually working on the anchor handling equipment.

10.4.9.2 The anchor-handling winch should not normally be operated until all personnel are clear of the deck.

#### **10.4.10 DEVIATION PROCEDURE**

Written procedures must be established detailing responsibilities and authorities if it becomes necessary to deviate from the planning during the operation. Any deviation from the plan must be agreed by all parties.

#### **10.4.11 CREW BRIEFING**

The Master must brief the crew on the planned operation prior to work commencing. The briefing must be as detailed as necessary to fully inform crew members of the proposed work program together with any unusual aspects of the job and hazards that may be encountered. Particular attention should be paid to briefing new or inexperienced crew members as to the hazards associated with anchor handling work. A Job Safety Analysis covering the proposed work program during this 'Toolbox Meeting' must be reviewed and any necessary procedural changes made.

#### **10.4.12 EQUIPMENT**

10.4.12.1 In order to maintain a safe working environment for all personnel on board the following points should be addressed:

10.4.12.2 There should be in place a safe and effective method of stoppering wire pendants.

10.4.12.3 The operation and maintenance of all equipment should be in accordance with manufacturer's instructions and good practice.

10.4.12.4 A suitable system should be in place for the testing, inspection, maintenance and recording of anchor handling equipment retained onboard vessels and installations. A means for recording the results and frequency of such work should be used.

10.4.12.5 Particular attention should be paid when using soft eye pendants as they wear more quickly than hard eye pendants and require frequent inspection. Hard eye pendants are also subject to distortion in the thimbles which may render them unusable or unsafe. If doubts exist as to the suitability of the pendant it should be returned to the rig and replaced.

10.4.12.6 Hard eye or soft eye wires with a 'Tellurit' or sleeve (ferrule) type termination should not be used in a mechanical stopper where the sleeve bears the weight against the stopper jaws or inserts. Wire pendants may be supported in mechanical stoppers by attaching five links of anchor chain to the pendant or forming three links of

anchor chain with the thimble and using a chain link in the mechanical stopper (BMT Cortec Ltd. report to the U.K. Dept. of Transport March 1992).

- 10.4.12.7 All equipment used in anchor handling operations should be secured until required.
- 10.4.12.8 Care should be taken when opening up wire coils, in particular pendant wires, as injuries have occurred by the springing open of the coils following release of the securing bands.
- 10.4.12.9 When running anchors, the anchor-handling vessel Master should be advised where the installation winches have payout limitations so that speed can be controlled. Effective communication should be established between the Master and the winch driver.
- 10.4.12.10 It is preferable to have a length of chain installed between the crown of the anchor and the pendant and this chain should be long enough to reach the vessel securing device and thus allow crews to change pendants without the necessity to deck the anchor.

#### **10.4.13 WEATHER LIMITATIONS - RESPONSIBILITIES**

Weather forecasts are to be available during all rigmove operations, and operations planned accordingly. In marginal weather conditions the Master of each vessel and the person in charge of the move should agree to terminate/commence operations. Ultimately, the Master of each vessel has the responsibility to decide whether or not conditions allow his vessel to operate safely.

#### **10.4.14 LOADING/UNLOADING RIGS WHILST UNDER WAY**

Due to the effects of interaction between two moving vessels, all forms of cargo work/transferring of equipment between mobile offshore units/vessels when both are under way should be avoided.

#### **10.4.15 PROTECTIVE EQUIPMENT AND CLOTHING, SAFETY EQUIPMENT**

- 10.4.15.1 Full safety equipment should be readily available on deck during all anchor handling operations.
- 10.4.15.2 Protective clothing worn during anchor handling operations should include, but need not be limited to:
  - Coveralls
  - Safety boots
  - Gloves
  - Safety helmets complete with chinstrap
  - High visibility workvests
  - Approved buoyancy aids
  - Safety glasses (including sun glasses for high glare conditions)
  - Sun cream
- 10.4.15.3 In addition, suitable wet and cold weather clothing must be available.
- 10.4.15.4 Lifebuoys with lines should be readily available.

**10.4.16 CHAIN CHASING**

- 10.4.16.1 This operation should be performed using the recommended amount of wire for the depth of water and using the methods recommended by the manufacturer.
- 10.4.16.2 To avoid picking up bights of chain/wire with consequent overloading of the gear, tension should be maintained by the installation on the anchor chain/wire until the vessel has run the full distance and is ready to commence heaving.
- 10.4.16.3 The vessel should be kept directly over the line of the anchor cable while chasing to avoid overloading of the equipment.
- 10.4.16.4 Care should be taken not to use excessive amounts of power on the vessel's propulsion as this may also overload the equipment.
- 10.4.16.5 In all cases the crew should be off the deck and in a protected location during chasing operations.

**10.4.17 GRAPPLING**

- 10.4.17.1 Care should be taken deploying grapples and 'J' hooks over the stern as if the weight suddenly comes on the pendant wire it may whip across the deck.
- 10.4.17.2 Excessive power or speed may cause sudden overloading on equipment when the grapple or 'J' hook encounters the cable.

**10.4.18 RECOVERING ANCHORS**

- 10.4.18.1 Care should be taken when lifting anchors, especially those that are deeply embedded in the seabed, to avoid as much as possible sudden heavy loads on the pendant string from the rise and fall of the vessel in the seaway.
- 10.4.18.2 If it is necessary to deck an anchor, it should be secured on deck such that it cannot move due to the movement of the vessel.

**10.4.19 MULTIPLE PENDANTS**

Care should be taken when stowing multiple pendants on the winch drum to avoid fouled pendants when the wire is unwound. If 'bow' type shackles are used they should be placed so that the pin is toward the winch as this reduces the possibility of fouling behind the pin when the wire is unwound under load.

**10.4.20 LENGTH OF PENDANT FROM RIG**

The length of pendant that is passed to the vessel from the installation should be sufficient to allow the vessel Master room to manoeuvre to keep the pendant slack while it is being connected to the work-wire/pendant by the deck crew.

**10.4.21 ANCHOR DEPLOYMENT**

- 10.4.21.1 The anchor handling vessel should be held in line with the anchor cable while the anchor is deployed and until the buoy is in the water so that the pendant is laid out in a straight line away from the anchor, reducing as much as possible the hazards associated with fouled anchors.

- 10.4.21.2 The installation should tension the cable as soon as possible after the anchor is on the bottom to ‘set’ the anchor below the seabed and thus avoid fouled anchors.

#### **10.4.22 *BUOY DEPLOYMENT***

Buoys should be deployed from as close to the stern of the vessel as possible to avoid an uncontrolled and damaging progression along the length of the deck.

#### **10.4.23 *PASSING PENDANT TO RIG***

Care should be taken that the pendant is not released from the securing device on deck until the crane has taken the weight as this can lead to unacceptable shock loads on the crane.

#### **10.4.24 *CLEARING FOULED ANCHORS***

- 10.4.24.1 Crew members should be aware that coils of pendant wire fouling an anchor may move sharply as they are cleared. Clearing should be accomplished as much as possible using tuggers and other mechanical means.
- 10.4.24.2 Pendant wires that have been cleared from a fouled anchor should be closely inspected by an officer of the vessel for damage before a decision is made as to whether they are suitable for use. If there is damage to the wire sufficient to render it suspect, the wire should be marked ‘unserviceable’ and returned to the installation where it should be quarantined and marked ‘Out of Service’.

### **10.5 *TOWING OPERATIONS***

#### **10.5.1 *GENERAL***

- 10.5.1.1 Towing has the potential to be a hazardous operation. Offshore personnel should be aware of the operational limitations of the various vessels utilized, including their power and freeboard, with the safety of crews being of paramount importance.
- 10.5.1.2 Offshore installation personnel should ensure that, whenever tow-wires are passed to vessels by crane, crane drivers are competent to undertake this operation. The operation should be adequately supervised.

#### **10.5.2 *AGREED PROCEDURES AND RESPONSIBILITIES***

- 10.5.2.1 Full procedures for towing operations must be agreed by operators and their Mobile Installation Contractors and clear instructions laid down in writing. Where particular installations have detailed procedures for towing, these must be passed to the relevant vessels via the operator as required, so that Masters are fully briefed on the operation to be conducted. If possible, Masters should be briefed prior to leaving port but most certainly on location prior to rig move operations.
- 10.5.2.2 The procedures must identify the responsibilities of key personnel.
- 10.5.2.3 It must be clearly established in writing who is in charge of the tow. Normally the person in charge will be one of the tug masters who should be appointed as tow-master by the operator in writing. If the operator requires the tow-master to be a person on the towed vessel or appoints a tow-master to sail on one of the tugs, that

person should be stipulated in writing and his responsibilities clearly laid down. Any person designated as tow-master or person in charge should be a qualified Master Mariner with experience in the offshore towage industry relevant to the operation at hand.

- 10.5.2.4 The Master of each vessel is responsible for the maintenance and use of the ship's own equipment.
- 10.5.2.5 The owner and operator of the installation is responsible for all installation equipment, including equipment hired specifically for the move, and all towing gear on the installation.
- 10.5.2.6 Where vessels are engaged in towing operations, a system to prevent tow-line chafing should be adopted.

### **10.5.3 EQUIPMENT**

- 10.5.3.1 Vessel owners are responsible for ensuring that vessels involved in towing operations, together with their equipment, are fit for the purpose and adequately manned by competent personnel with the relevant experience.
- 10.5.3.2 A safe method of passing the main towing pendant from the installation to the towing vessel should be established, with a clear understanding of the procedures to be used by all parties.
- 10.5.3.3 If a messenger is used to pass the tow-wire to the towing vessel, it should be of adequate strength to support the entire weight of the towing bridle and fore-runner or at least long enough to allow an adequate strength messenger to be on the winch of the towing vessel before the weight of the gear is taken. Recovery wires led to appropriate winches on board the installation may be used to relieve weight on the towing vessel's equipment during connection/disconnection but these should not be so taut as to hold the weight of the gear above the water level or in any other way pose a danger to the towing vessel crew. The installation crew must take instruction from the towing vessel master as to the use of these winches.
- 10.5.3.4 As soon as the towing vessel is connected and commences towing operations, winches on the vessel being towed (if used in the towing gear) must be continuously manned during the initial stages of the tow, and be under control of the towing vessel's Master.
- 10.5.3.5 Once the tow is safely connected, the crew should 'clear the deck' and stay clear until the tow is streamed to towing length and the Master authorizes fitting of chafing gear or other necessary maintenance.

### **10.5.4 INSPECTION**

The towing equipment should be inspected by a competent officer of the vessel before connection to ensure that there are no apparent defects that may affect the safety of the tow.

### **10.5.5 CLEAR DECKS**

- 10.5.5.1 Vessels involved in towing should have decks as clear as possible with no cargo or other equipment encroaching on the area of the deck covered by the tow wire between its extremes of possible movement.
- 10.5.5.2 Any equipment that is not necessary for the tow should be discharged back to the installation and anything carried on deck during the tow is to be only carried at the discretion of the towing vessel master. Such discretion should only be exercised when material that is proposed to be carried cannot impede the free movement of the tow-wire or the crew during work necessary for the conduct of the tow.

### **10.5.6 RESERVE TOW EQUIPMENT**

- 10.5.6.1 The secondary towing system on an installation should be identified, a readily available method of retrieval of the main towing gear established, and a safe method of passing the secondary towing system agreed.
- 10.5.6.2 Towing vessels engaged in long tows or where there is only a single towing vessel should carry a complete set of spare gear to enable reconnection in the event of failure. This will normally be a requirement of the underwriters in any case.
- 10.5.6.3 Where possible, spare tow-wires should be stored permanently on powered drums as this greatly assists the crew should the spare tow-wire be required to be installed. Spare tow-wires should be stowed on the drums with the bitter end outward.
- 10.5.6.4 Towing vessels should ensure that the installation personnel are aware of the time that may be required to rig their spare towing wire. When an additional vessel is available as reserve tug whilst on passage, it should be rigged for towing.
- 10.5.6.5 All crew must be fully briefed on the procedure for installing the spare tow gear and reconnecting as this is normally required to be done in adverse conditions when hazards are greater than normal and mistakes can be made due to undue haste.

### **10.5.7 MANNED TOW**

- 10.5.7.1 It is the responsibility of the personnel on board the towed vessel to maintain the proper navigation signals on a manned tow and to follow the instructions issued by the tow master.
- 10.5.7.2 It is the responsibility of the personnel on board the towed vessel to maintain the vessel properly ballasted and trimmed and not to make changes without the prior knowledge and agreement of the Master of the tug.
- 10.5.7.3 There should be a continuous communications link on a dedicated channel established and maintained between the tug and tow for the duration of the tow.

### **10.5.8 UNMANNED TOW**

- 10.5.8.1 The Master or officer of the towing vessel must inspect the towing arrangements of unmanned tows to familiarise himself with the layout of both main and reserve towing gear on the vessel to be towed and to have any apparent defects corrected before connection.

- 10.5.8.2 The Master or officer of the towing vessel must also check that the navigation lights of the vessel to be towed are working and have sufficient capacity to last the entire length of the proposed tow.
- 10.5.8.3 A competent officer of the towing vessel should inspect any machinery that may be fitted to the vessel to be towed to ensure that side valves, watertight doors and any other hull openings are closed and that the towed vessel is in all respects ready for the proposed tow, properly ballasted and trimmed.
- 10.5.8.4 The reserve towing gear must be rigged so that it can be recovered by the tug crew without having to board the tow. This normally means a floating line streamed astern of the tow connected to the reserve towing gear.
- 10.5.8.5 The Master of the towing vessel should also satisfy himself that sea fastenings on any cargo that the towed vessel is carrying are adequate for the intended tow.
- 10.5.8.6 The operator, owner or charterer of the towed vessel or installation must make good any deficiencies noted by the Master prior to commencing the tow.

## **10.6 BARGE WORK**

### ***10.6.1 TOWING IN NARROW/SHALLOW CHANNELS***

As this is done using a very short tow-wire and normally necessitates large alterations of course and variations in power applied, it is important that all crew remain off the work deck in an area clear of any possible hazard once the tow is connected.

### ***10.6.2 HIPPING UP***

- 10.6.2.1 Hipping up to the barge for close handling work requires considerable tension to be applied to the tug mooring lines if it is to be done effectively. The crew must be properly briefed prior to hipping up so that they are aware of the particular hazards associated with this operation.
- 10.6.2.2 Hipping up at sea presents additional hazards due to movement caused by sea and swell and deck crew should exercise great care when handling mooring lines to avoid injuries.
- 10.6.2.3 Consideration must be given to the limitations imposed by the shape of the vessel and the effect that any movement in the seaway will have on the safety of the operation. In most circumstances, support vessels are not designed with sufficiently straight sides and bow or with sufficient structural strength in this area to allow hipping up vessels in a situation where movement in the seaway between the vessels may occur.

### ***10.6.3 HIGH WIRE HAZARD***

Crews must be made aware of the hazard presented by a high wire when working close to a barge with a high bow and short bridle and fore-runner. This may cause the towing gear to rise and fall from the work deck if weight unexpectedly comes on the wire during connection/disconnection. No attempt should be made to work on the wire while it is off the deck or when there is any weight on the gear.

## **10.7 WORK OVERTHREAD OR ON BUOYS**

### **10.7.1 WORK OVERTHREAD**

- 10.7.1.1 Work to be carried out over the side of the vessel, or from an area where there are no handrails and there is a risk of crew falling into the water, should be the subject of a work permit.
- 10.7.1.2 Appropriate safety equipment such as lifelines, buoyancy vests or life jackets, safety helmets etc. must always be worn by crew members working over the side, whether at sea or in port.
- 10.7.1.3 Equipment used in this work must be in good condition and the rigging supervised by a competent person.
- 10.7.1.4 A means of escape, such as a ladder properly secured must be left rigged and accessible to those working over the side for the duration of the work.

### **10.7.2 WORK ON BUOYS**

- 10.7.2.1 Weather conditions as well as other factors will dictate if it is safely possible to perform work on buoys in the water. The Master is responsible for the decision to proceed having taken due regard of the particular circumstances.
- 10.7.2.2 As with work over the side, buoyancy vests or lifejackets and lifelines as well as other standard safety clothing should be worn should it be necessary for crew members to work on buoys in the water.
- 10.7.2.3 The particular hazards associated with this work must be fully explained to crew members prior to operations, and the objectives and means to achieve them fully discussed and understood.
- 10.7.2.4 The means of access for the crew to the buoy must be carefully considered prior to the operation taking place. In most cases a rescue boat or small boat transfer is considered to be the safest. Jumping in any form is to be avoided unless absolutely necessary.
- 10.7.2.5 Each crew member on the buoy must have a short length of rope that can be secured to the buoy and used as a holding point to steady against the movement of the buoy in the water or jolts from contact with the vessel or transfer boat.
- 10.7.2.6 Care must be taken to avoid violent contact between the vessel or its propeller wash and the buoy if it is necessary for operations to be conducted at close quarters while the buoy is manned.