

# **BULK HOSE BEST PRACTICE GUIDELINES**



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## **ABBREVIATIONS**

|        |                                                  |
|--------|--------------------------------------------------|
| BOSVA  | British Offshore Support Vessel Association      |
| COSHH  | Control of Substances Hazardous to Health        |
| EMS    | Electronic Maintenance System                    |
| EPDM   | Ethylene Propylene Diene-Terpolymer              |
| GPA    | General Platform Alarm                           |
| ID     | Identification                                   |
| LOLER  | Lifting Operations Lifting Equipment Regulations |
| NWEA   | North West European Area Guidelines              |
| O&G UK | Oil & Gas UK                                     |
| OIM    | Offshore Installation Manager                    |
| PMR    | Planned Maintenance Routine                      |
| PSS    | Platform Services Supervisor                     |
| SOPEP  | Shipboard Oil Pollution Emergency Plans          |
| STL    | Services Team Leader                             |
| SWL    | Safe Working Load                                |



## **INTRODUCTION**

### **Background**

Integra is an initiative that was established by Sparrows and Sigma 3 in 2006 to deliver best practices in crane and deck operations in the offshore industry. It was quickly realised during their offshore visits that there was a need to produce guidance to manage bulk hose systems safely and at the same time create a common practice throughout the industry. The key elements required in coaching personnel to recognise and eliminate hazardous risks to themselves and others are contained within management systems. These systems eliminate damage to plant and equipment, providing safer operations and stricter controls of environmental issues.

We recognised minimum standards of controls and guidance are in place to manage and maintain bulk hose systems, including hose hang-off points on installation structures. We also acknowledged the difficulties in being prescriptive due to the differences in installation layouts and working practices. To make positive changes in our operations we have collated information from the workforce on how to manage work involving bulk hose systems. The following guidelines indicate best practices which will reduce the number of hose failure incidents in the industry and the resulting exposure to the environment.

### **Environmental Issues**

With the evidence available it was identified that 21% of spills to the sea were hose related incidents. The most common bulk hose failures are due to abrasion to the outer cover of the hoses rubbing on the installation structures, resulting in leakage from the hose string. The wear on the hose is accelerated when the hose radius exceeds the recommended minimum bend radius criteria causing premature failure. Both examples can cause the hose to leak into the sea if not controlled by a robust hose management system. All environmentally sensitive products should have suitable hose connections or similar self sealing connection on the hose end.



## **GENERAL REQUIREMENTS**

The following recommendations apply to any hose which carries products, including products that are harmful to the environment if containment is lost.

It is recommended by hose manufacturers, based on information taken from previous incidents on installations that a bulk hose should be changed out approximately every two years due to internal fatigue to the hose layers. When the hose is not in use an end cap, commonly known as a blank, should be used on the connection that marries the hose to the vessel manifold, and where possible protect the hose ends with a waterproof cover preventing contamination, corrosion or damage to the hose connection.

When hose strings are suspended from the installation, they should be suspended well clear of the sea and restrained to the installation minimising movement and abrasion to the hoses' outer cover, preventing the waves from twisting the hoses. Where the hose may contact any part of the installation structures all contact points on the hose should be covered with a form of protection. Floatation collars can be used or alternatively, sections of redundant hose can be fitted to the structures at impact abrasion points. Floatation collars should be used either side of the hose couplings to prevent the coupling damaging an adjacent hose in the fingers.

To prevent excessive load on a suspended hose string, the hose should be drained back to the vessel or installation once offloading is completed. Hoses should be suspended from sound structures or certified lifting/hang-off points on the installation to prevent kinking in the hose string. If required the LOLER Competent Person or equivalent, or structural engineer, should be consulted for guidance. Hoses should never be suspended or supported by wire slings as they may cut into the hose and damage the hose structure. The LOLER Competent Person should be consulted for selection of correctly certified and appropriate slings.

When replacing a length of hose in a string, the string must be brought in board and barriers erected round the hose indicating no unauthorised entry during the replacement of the hose and/or floatation collars. Once a hammer lug union is installed and tightened it should be marked across both faces with paint or similar permanent marker to monitor the fitting is continually taut and fit for purpose.

Care should be taken when using cutting tools to remove packaging from a new hose. It is imperative that no damage comes to the hose section during unpacking.

**Prior to commencing any offloading operations the hose string should be visually inspected for damage using the list below as a minimum check:**

- Leaks at the hose fitting or in the hose make up
- Damaged, cut or abraded covers
- Exposure of reinforcement wires from the hose material
- Signs of kinked, cracked, crushed, flattened or twisted areas in the hose sections
- Hose ends degraded, pitted or badly corroded at the fittings
- Identify sufficient numbers of floatation collars are on the hose string



- On completion of bunkering operations the hose should be re-examined for any damage that may have occurred during the transfer operation

### **INSTALLATION PROCEDURES**

- Documents should be in place clearly specifying how the site will control the maintenance and inspection of all bunkering hose strings and associated equipment i.e. lifting equipment and support mountings. This document should be approved by the relevant Technical Department and entered into their pertinent system for review as per the Company Procedures. The appointed system owner is responsible for ensuring all relevant persons know of and understand the procedure. It is recommended a competent/responsible person carries out frequent lifting equipment audits to confirm this.

### **RECOMMENDED CONTENT OF PROCEDURES**

- The system owner should indicate who is responsible for ensuring the procedure is being adhered to and act as focal point on all matters relating to bulk hoses maintenance and inspection.
- On locations where bunkering of drilling products takes place, an interface should exist with the Drilling Department and Operations Departments where responsibilities are clearly defined, documented and agreed i.e. who is responsible for inspection and change-out of drilling product hose assemblies. The role of Service Team Leaders, Barge Engineers or Deck Foreman should be considered for System Owner positions.
- Guidance based on information gathered from the hose manufacturers on the life span of in-service hoses before mandatory change-out is required. Identify the time periods between physical and visual inspections including pre and post use checks of the equipment. This decision is addressed with relevant parties such as Suppliers and Company Technical Authorities. An Electronic Maintenance System (EMS) would be ideal to populate/generate change-out dates and inspection dates, and guidance on the required documents e.g. Permits to Work, COSHH and Method Statements to carry out the work scope safely. On completion of any parts being changed-out, documents and identification (ID) of equipment must be updated in the hose register. In the case of replacement hose assemblies already stored offshore, a guidance note on the correct procedure of storage and shelf life should be obtained from suppliers.
- To assist in the managing, ordering and replacement of bulk hose equipment, drawings which may be electronic or hard copy, consisting of the following, would ensure the correct parts are ordered and installed at all times:
  - The correct hose lifters (hooky hooks) and their SWL
  - The type of delivery coupling, be it self-sealing or hammer lug unions
  - The correct type and quantity of floatation aids/collars and their positions in relation to the string and joining couplings
  - Describe the type and SWL of the hose lifting assembly used for transferring the hose string during operations



- In the case of strings being made up from both hard and soft wall sections their chosen positions should be identified in the drawings
- Identify all components by part numbers

Method Statements, Lifting Plans and Risk Assessments must be in place and available for the work party. The System Owner and work party should review these documents before use, however if on completion of the task lessons were learned, the documents should be updated accordingly by identifying the changes in the procedures.



### **BAD PRACTICES**



**The hose should be suspended avoiding sharp bends and protrusions when in a hang-off position**

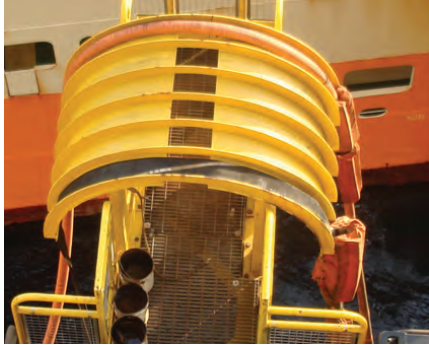
### **GOOD PRACTICES**

There are alternative systems available such as portable saddles which support the arc of a hose when in storage. The structure from which the hose is to be suspended must be surveyed by a competent person to ensure the hang-off point is of sound structure.



**Portable Saddles**





Permanent structure used to support bulk hoses forms a perfect arc enhancing the life span of the hose.

### TRANSFER HOSES

Historically many installations preferred to work supply vessels with three hard wall sections of hose. This was until evidence indicated that when using hard wall hose strings considerable problems were caused for the supply vessel deck crews.

The supply vessel crews found it was difficult to manipulate the hose into position when connecting hard wall hoses to vessels' manifolds. Other examples were found when the installation deck crew were repairing or making up these hose strings. Installation and vessel crews reviewed the hazards caused when using hard wall hoses and agreed the first and second section of the hose suspended from the installation manifold could be hard walled, and the last section which is offered to the supply vessel to be of soft wall material, which would help reduce the incidents that the deck crew were experiencing when making up hose strings, specifically when connecting the installation hose to the vessel manifold.

### HOSE COMPONENTS AND CONSTRUCTION

All new hose sections are hydro-tested to at least 1½ times their working pressure.

A water hose is made from orange coloured, soft, reinforced rubber with the cover being made of ethylene propylene diene-terpolymer (EPDM) hose reinforcement being provided by multiple layers of rot-proof synthetic textile yarn. The central core/tube is made from non-toxic and non-tainting rubber. The cover is abrasion and weather resistant, and care should be taken when handling and stowing. It should be noted that new floating hoses are also coloured orange and these hoses can carry a range of products.

A fuel hose is heavy and commonly soft wall type, but can be of hard wall construction. The outer wall is made of black oil resistant neoprene synthetic rubber and is reinforced with synthetic textile yarn with antistatic copper wire. It has a black nitrile tube. The outer cover on

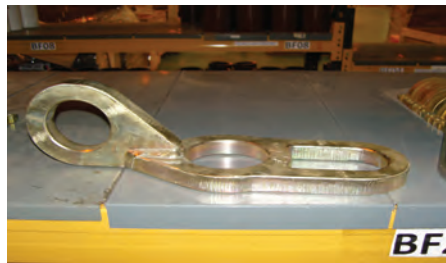


this hose is susceptible to mechanical damage. The hose carries a brown lazy spiral stripe for identification.

### **HOSE STRING**

A hose string can be made up of 3 or 4 lengths of 15.2mtr, 16.3mtr or 18.3mtr lengths of hose joined together by quick release self sealing couplings (hammer unions). The hose comes complete with a hose lifting assembly that consists of a hooky hook, lifting sling not less than 2 metres in length and a safety pin shackle. The pin used to secure the nut must be a “split pin” and not an “R” clip. “R” clips can spring off the pin affecting the security of the shackle.

When ordering new hose sections stipulate the direction of the lifting eye, as the hooky hook can be installed on the hose with the lifting eye facing up or down on the hose. If the hose is stored in a support frame then the eye in the hooky hook should be facing upwards, if using any other type of hose support then the eye on the lifter can be either way on the hose.



**Hose Lifter (commonly known as hooky hook)**

The hose should be fitted with the correct number of floatation collars to prevent the string sinking and being drawn into the supply vessel's thrusters. The floatation collars can also be used to help form a barrier between the hose and installation structure by simply adjusting the collar straps on the hose. Reflective floatation collars have an advantage when bulk is being transferred to an installation in the hours of darkness as the crew can see the hose is floating freely rather than being too close to the vessel side thrusters.





### **New Hose Storage**

Hoses delivered to the installation are normally shrink wrapped and rolled up with one end of the connection in the middle of the roll. It is preferable to store these hoses flat, out of sunlight and free from water ingress. Ultra violet radiation and kinking during storage may shorten the life span of the hose. Manufacturers' recommendations on hose storage should be available for crews to ensure optimum methods of use to prolong hose life.

### **REPLACING SECTIONS OF HOSES IN A STRING**

Only competent personnel should carry out the installation of hoses and connections when joining hammer lug unions. When repairing a hose string the hose should be landed rather than left hanging from a crane hoist line. When replacing a section of hose it should be inserted in the coupling and secured whilst free from tension.

Once the necessary controls such as permit, method statement and risk assessments are in place then remove and replace the worn parts of the string. When hammer lug unions are disturbed the unions should be tightened up and marked across the body with paint or a similar permanent marking. This is a simple way to indicate if the coupling has slackened off due to movement whilst in service. On completion of hose installation, the hammer lug union should be checked for the marks across the coupled joint to confirm security. If possible pressure test the hose string to 5 bar and check the assembly is free of leaks over a 5 minute period. Check the correct quantity of lace up or similar types of floatation collars are on the hoses in accordance with Table 1 on the following page.



### Recommended Floatation Collars for Bunkering Hose Strings

**Diameter - Floatation Collars - Colour Codes and Connections for 15.2 mtr, 16.3 mtr and 18.3mtr Hoses**

| Hose Application | Hose Dia | Floats per Section | Colour Code | Connection                                           |
|------------------|----------|--------------------|-------------|------------------------------------------------------|
| Potable Water    | 3"<br>4" | 4<br>4             | Blue        | 3" & 4" Hammer Lug Union                             |
| Oil Based Mud    | 3"<br>4" | 9<br>10            | Red         | 4" Hammer Lug Union or self sealing hose connections |
| Dry Cement       | 4"<br>5" | 7<br>8             | Yellow      | 5" Hammer Lug Union                                  |
| Diesel Fuel      | 3"<br>4" | 4<br>4             | Brown       | 4" Self sealing hose connection                      |
| Dry Barite       | 4"<br>5" | 10<br>13           | Orange      | 5" Hammer Lug Union                                  |
| Methanol         | 2"<br>3" | 4<br>4             | Purple      | 4" Self sealing hose connection                      |
| Drill Water      | 4"       | 4                  | Green       | 4" Hammer Lug or self sealing hose connection        |

**Table 1**

The above information is a recommendation from North West European Area Guidelines. As a minimum requirement for best practice, a float either side of any coupling that is in the water during bunkering operations would be advised.

Trials of "floating type" bulk hoses have recently been carried out on some installations and have proved to be very successful, with positive feedback from all concerned platform and supply vessel personnel.

As a result of these trials a major operator decided that this type of hose shall be used in the future. Therefore whenever a bulk hose section has been deemed to be no longer fit for purpose, the replacement ordered shall be of the floating type if the section, when in use, will be floating in the



water. It should be made clear at this point that we do not expect all installation bulk hoses to be changed out en masse but on an “as and when required” basis.

Each installation shall consider that when a new drilling campaign is due to begin and the associated bulk hose sections are ordered, to only order the new type for sections that when in use will be floating in the water. The new type of hose shall be used for every type of bulk cargo transfer.

The pre and post use inspection of the new type hoses carried out by the Deck Crew shall remain the same. An appointed contractor will receive instructions from the manufacturer on the inspection criteria to be carried out by them. See page 19 for examples of floating hoses in use

The ideal make up of the bulk hose string shall be either 3 or 4 standard lengths (18.3 metres) depending on the installation needs and the elevation of the manifold. There is no requirement to have the first section of bulk hose leading from the manifold and not coming into contact with water, to be of the floating type.

A typical hose string of 3 lengths would be:

Length 1: Hard wall

Length 2: Floating hose

Length 3: Soft wall (outboard/vessel end)

## **WEEKLY INSPECTIONS**

- A regular inspection PMR/Work Order signifies a competent person has assessed the hose and lifting equipment and that it is in good working order. This person records the findings electronically in a controlled register. This system indicates to any 3<sup>rd</sup> party auditors that a sound maintenance strategy is in place to manage bulk hose assemblies.
- Check all lifting slings, shackles and hooky hooks are in good condition and display current lifting colour codes.
- Check the hose for any physical damage for chafing, cuts, blisters, splitting, perishing, lacerations or other forms of deterioration.
- Renew any damaged hoses in the string and where minor damage is evident record details on the check sheet.
- Check markings across the hammer lug union line up as this indicates the fitting is tight on the coupling.
- Check hoses are protected from platform structure and stowed properly in hang-off points.
- Check that hang-off point structures shows no sign of deflection or excessive corrosion.
- Consider inspecting hoses inboard once per trip as there are blind spots on the installation structure that restrict visual inspections.
- Check the under-deck lighting on the installation is operational at valve manifolds.



- Check gates on the bunkering station hang-off points (fingers) are lubricated and easy to open and close.

**A record of visual and routine inspections should be available for history and evidence of hose checks:**

| <b>RECORD OF INSPECTIONS ON BULK HOSE LIFTING ARRANGEMENTS</b> |                                               |                                                 |                                                |                                          |                 |
|----------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------|-----------------|
| <b>LOCATION<br/>LIFTING<br/>EQUIPMENT</b>                      | <b>HOSE<br/>LIFTING<br/>SLINGS<br/>I/D No</b> | <b>HOSE<br/>LIFTING<br/>SHACKLES<br/>I/D No</b> | <b>HOSE LIFTING<br/>HOOKY HOOKS<br/>I/D No</b> | <b>CHECKED BY<br/>SIGNATURE<br/>DATE</b> | <b>COMMENTS</b> |
|                                                                |                                               |                                                 |                                                |                                          |                 |
|                                                                |                                               |                                                 |                                                |                                          |                 |
|                                                                |                                               |                                                 |                                                |                                          |                 |
|                                                                |                                               |                                                 |                                                |                                          |                 |

#### **AFTER STORMS**

A visual inspection should be carried out to confirm hoses show no signs of physical damage. Examples would be chafing, splitting, perishing or any other form of deterioration. It is not uncommon for hoses to become twisted around each other if they were not far enough out of the water when exposed to severe weather, making it an operationally difficult when realigning the bulk hoses.



### **VISUAL INSPECTION PRE AND POST USE**

A visual inspection must be carried out prior to and after vessel operations. The following checks should be carried out as a minimum:

- Correct colour coded hooky hooks, slings and shackles with proper split pins are attached to the hose. Hoses must show no signs of physical damage to fabric by chafing, splitting, perishing, blistering, deep lacerations or any other forms of deterioration.
- Check installation manifold couplings are tight and ready for operation.
- When using certain types of hose fittings remove the end screw dust cap before lowering the hose to the vessel, and on return to the installation replace the dust cap and check it is secured to an anchor point.
- Check gates on the bunkering station hang-off points (fingers) are maintained, lubricated and easy to open and close.

The preferred way to visually check a hose is to place oneself in a safe position at the hose station and direct the crane operator to slowly raise the hose, allowing you to visually inspect the hose for wear.

Never allow the hose to be lifted close to the crane hoist rope safety cut-out. A similar method can be used to check the hose for damage when returning the hose to its hang-off point.

**Note – Take care to avoid the hose being lifted immediately over the head of the person doing the inspection.**

### **GENERAL PLATFORM ALARM (GPA)**

If the installation goes to a GPA status then bunkering operations must cease. The supply vessel's Captain and crane operator must be notified immediately of the GPA and company specific procedures are then followed before reporting to their muster station.

### **VESSEL APPROACHING LOCATION**

Before any operation involving bulk hoses is undertaken at installations, refer to the following:

The Services Supervisor or equivalent will review the weather, wind speed and sea state. The Captain of the vessel will review the operational limitations of his vessel and only when satisfied will enter the installation's 500 metre zone.

Before the vessel arrives at the installation the Captain will discuss the relevant shipment with the Services Supervisor (SS), Services Team Leader (STL) or equivalent. The deck foreman will liaise with the crane operator and the vessel Captain to confirm if conditions are favourable for bunkering and transferring cargo. The installation and vessel must complete their respective pre 500 metre entry checks prior to the vessel entering the 500 metre zone

Once the vessel Captain is satisfied that he is on station the crane operator can then lower the hose to the vessel at a height that allows the crew to secure the hose to the vessel's side rail. The vessel crew need to be aware of the operation and maintain a line of sight with the crane driver on the installation to ensure that they do not stand under any suspended load. Once secure the hose end is lowered inboard of the rail



and the crew disconnect the crane hook. Once the hook is clear the ship's crew will connect the hose to the appropriate manifold. The ship's crew should be reminded that the hose coupling should, wherever possible, avoid contact with the ship's structure and should monitor the integrity of the hose coupling during transfer.

**Note:** In marginal weather great care is required by the vessel master to avoid over-running the hose especially if the cargo is also being transferred. Consideration should be given to the connecting of bulk hoses only at this time. During hose work deck foremen must listen to all communications on selected radio channels, which can be transmitted to the control room and platform crane operator should a hose assembly leak or significant changes in weather conditions occur.

### **POLLUTION SAFETY**

During fuelling operations there is always the risk of pollution, this may be due to hose and/or instrument leaks, hose wear, mechanical breakdown or if a hose becomes fouled in the vessel's propeller. It is important that an individual is appointed to visually check and operationally check the hose remains functional during bunkering operations.

If an oil sheen is detected on the surface of the water then bunkering operations must cease immediately. The incident must be reported to the control room and the cause investigated.

### **GUIDANCE ON BULK HOSE OPERATIONS**

**During bulk hose operations the following should be observed:**

- The vessel Captain, crane operator and deck crews to confirm radio communication prior to operations.
- The person appointed to supervise the bunkering process must ensure he can see the bulk hose(s) at all times, and that he is familiar with the alignment of valves and tank levels. He should not allow other distractions during the operation.
- The installation dry bulk vent line positions are identified.
- The vessel bridge or equivalent and OIM/Bargemaster or equivalent should confirm quantities discharged and received at regular intervals, to ensure that there are no leaks within the respective systems.
- The vessel deck crew and installation crane operator must be readily available and close at hand throughout any transfer operation.
- Sufficient warning/instructions shall be given by each party prior to changing over the tanks.
- If at any stage in the operation the vessel Captain or provider is in any doubt as to the integrity of the operation, then that operation shall be suspended until integrity can be reinstated.
- When pumping is finished, both the receiver and provider shall set their line to allow the hose to be drained back to the vessel's tank. In suitable conditions the crane may also be used to lift the hose to aid draining. In the case of dry bulk, purge air should be used to empty the hose and clear the line.



- Hoses used for potable water must not be used for transferring other bulk liquids. Potable water lines should be flushed through prior to transferring water to avoid any residues within the lines contaminating the installation's supplies.
- During periods of darkness adequate lighting must be available over the hose and support vessel throughout the operation.
- To identify hoses they may be fitted with high visibility bands, tape or alternative means.
- Hoses are normally colour coded for manufacturers' identification and approval, frequently by way of spiral coloured bands within the hose structure. Ensure the management system is aware of the markings on the hoses.
- The manufacturers' colour coding of the hose should not be confused; any markings on receivers or structure should adopt the universal colour coding as described in Annex K, Section 4.18 of the **North West European Area Guidelines (NWEA)** to identify bulk hose products.
- All bulk hoses used offshore are to be of sufficient length and good condition; unapproved repairs shall not be carried out, and in the interests of safety the hose should be disposed of immediately.
- In the event that the crane operator has to leave his cab, he should first inform the Captain of the vessel but must remain in radio contact so that he is on immediate call.
- Any bulk hose should be disconnected from the vessel as soon as possible after the bunkering has been completed and retrieved to the platform, unless other wise agreed by the Captain of the vessel.

**Vessel should ensure that:**

- All pollution prevention equipment is in place as per vessel's SOPEP.
- If a connection other than a self sealing quick release coupling is used, particular care must be exercised when disconnecting the load hose and a drip tray must be in place.
- All manifold valves have been checked and confirmed to be in good condition.
- Correct couplings have been identified for the product(s) to be transferred.
- The person in charge of the operation performs no other duties during the transfer(s).

**RECENT DEVELOPMENT IN HANDLING BULK HOSES**

**Introduction**

The industry has identified a considerable rise in hose snagging incidents involving supply vessels, and enlisted the vessel Captains to assist in the development of a safety system to minimise the risks when receiving and removing bulk hoses from/to supply vessels. As a result of this, a method has been developed which resulted in minimal modification to the ships and minimal physical handling of the hose.



### Bulk Hose Hang-off Sling Attaching and Inspection Procedure

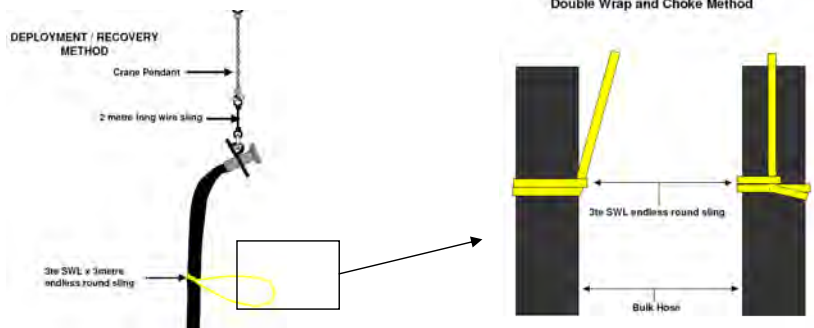
It has been identified that the use of an endless round web sling attached to the bulk hose and hung over a dedicated point on the supply vessel enhances the operation of passing the hose to the vessel from the installation. This process only relates to the attaching of the web sling to the bulk hose and the frequency of inspection.

**The requirement for this endless round sling will depend entirely on the facility of a suitable attachment point on the supply vessel being available.**

A dialogue between the Services Supervisor and each vessel shall take place to establish the requirement for this sling and the distance from the end of the hose to attach it.

### Attaching the Endless Round Sling to the Bulk Hose

- An endless round sling of 3 tonnes SWL shall be used.
- The sling shall be of 3 metres effective working length.
- The sling shall be signed out of the rigging loft and attached before each use, and detached and returned to the rigging loft for correct storage after every use.
- The sling will be attached to the bulk hose using the “double wrap and choke” method.
- The attachment point for the endless sling will be approximately 7 metres from the end of the bulk hose offered to the supply vessel; this distance will be confirmed by the vessel master.
- The endless round sling must only be attached to the bulk hose by a competent Rigger or a competent Slinger/Loadhandler.
- Once in position it shall be secured by tie-wraps or light cord to prevent slippage/loosening of the sling.



## **Inspection and Storage of the Endless Round Sling**

The LOLER Focal Point or a competent person must inspect the sling before and after each use to ensure it is still “fit for purpose”.

The sling is to be inspected to cover the following points as a minimum:

1. Check SWL.
2. Check colour code is current and ID Number is legible.
3. Check entire length for cuts, tears or chafing.
4. Check joint for burst stitching.
5. Check for chemical damage and heat damage.
6. Check there has been no ingress of foreign bodies into the fibres.

When checking the round sling, should any cuts be found in the outer protective cover then the sling should be **condemned** i.e. DO NOT USE as the inner strength core may be damaged.

When the bunkering operation is complete the round sling shall be removed and returned to the rigging loft for storage.

### **Requirement**

This requires three pins reasonably spaced out on the upper rail or taff rail on each side of the vessel to be welded in place, adjacent to the bulk hose manifolds.

These pins are used to hook the eye of an endless webbing strop on to a 3te SWL and ca. 2-3 metres long webbing sling when attaching the hose to the vessel.

### **Method**

The vessel Captain may ask for the sling on each hose to be adjusted for his manifold and hang-off points prior to coming alongside. This may vary according to the distance from the hang-off position of the required product manifold on the vessel. Under instruction the crane operator will transfer the hose from the installation to the vessel in the normal fashion. During the lowering of the hose as the hang-off strop nears the vessel's side rail, the crew will retrieve the eye of the strop by hand, or if necessary by boat hook, and fit the eye of the sling over one of the pins. Care must be taken by the vessel crew to avoid positioning themselves under the suspended hose during this operation. The crane operator, upon instruction, continues to lower the hoist rope until the sling takes the weight of the hose, the vessel deck crew then signal him to lower the hose end into the safe haven where they unhook the hose end, allowing the crew the freedom to manoeuvre the hose end onto the manifold.

On completion of transferring bulk the vessel deck crew drain the line and remove the manifold connection. The connection is moved away from the manifold by the crew prior to signalling the crane operator to lower his pennant to the deck crew. The hose end is attached to the crane hook via the



lifting sling, and once everyone is in a safe position the crane operator is given the signal to raise the sling until the hose and hang-off strop are clear of the vessel. This modification eliminates unnecessary risk to crews when transferring the hose back to the installation.

A final inspection should be carried out on the hose and lifting assemblies prior to and after use, recording findings on a check list (see template on next page).



| Pre-bunkering Checklist                                                                                  |  |  |  |  |  |  |      |
|----------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|------|
|                                                                                                          |  |  |  |  |  |  |      |
|                                                                                                          |  |  |  |  |  |  |      |
| Hose Inspected                                                                                           |  |  |  |  |  |  | Tick |
| Diesel                                                                                                   |  |  |  |  |  |  |      |
| Pot Water                                                                                                |  |  |  |  |  |  |      |
| Methanol                                                                                                 |  |  |  |  |  |  |      |
| Oil Based Mud                                                                                            |  |  |  |  |  |  |      |
| Barite                                                                                                   |  |  |  |  |  |  |      |
| Dry Cement                                                                                               |  |  |  |  |  |  |      |
| Drill Water                                                                                              |  |  |  |  |  |  |      |
| Hose fabric is in good condition and shows no sign of perishing                                          |  |  |  |  |  |  |      |
| Hose end caps are fitted after bulk transfers                                                            |  |  |  |  |  |  |      |
| Adequate floatation collars are fitted to hose string                                                    |  |  |  |  |  |  |      |
| Hoses are suspended correctly and nor tangled                                                            |  |  |  |  |  |  |      |
| Hose lifters (hooky hooks) are present, colour coded and fit for purpose                                 |  |  |  |  |  |  |      |
| Inspect the quick release coupling prior to and after use. Where available test against a blank coupling |  |  |  |  |  |  |      |
| Hose lifting assembly is present, colour coded and SWL                                                   |  |  |  |  |  |  |      |
| Hoses' protective covers preventing abrasion on structure are still serviceable                          |  |  |  |  |  |  |      |
| This list is not exhaustive and can be developed for specific operations.                                |  |  |  |  |  |  |      |
|                                                                                                          |  |  |  |  |  |  |      |
| Comments                                                                                                 |  |  |  |  |  |  |      |
| Checked/Signed                                                                                           |  |  |  |  |  |  |      |
|                                                                                                          |  |  |  |  |  |  |      |
| Date                                                                                                     |  |  |  |  |  |  |      |
|                                                                                                          |  |  |  |  |  |  |      |
| Vessel Name                                                                                              |  |  |  |  |  |  |      |



## BENEFITS

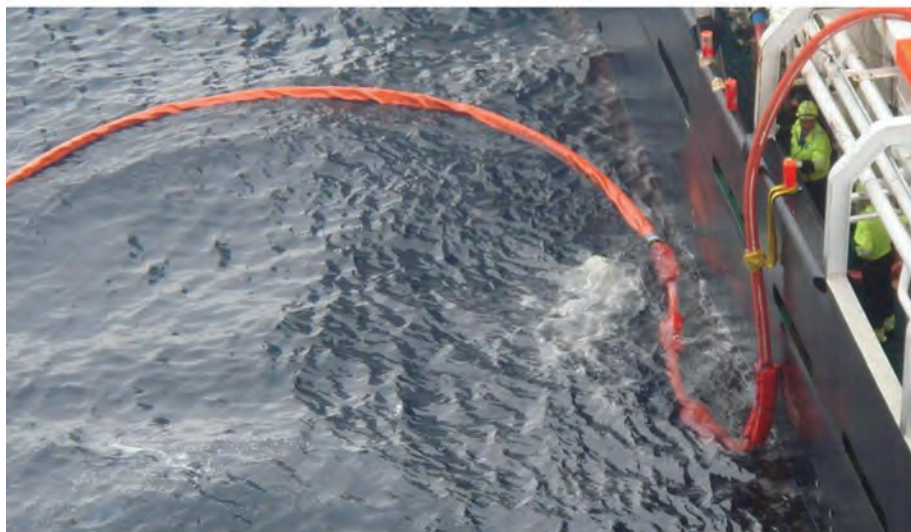
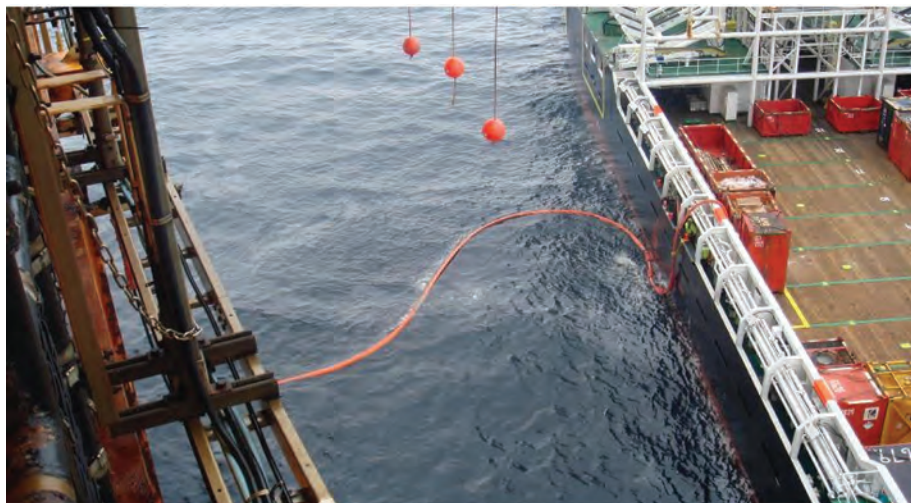
1. Securing the hose is simple and very effective in comparison to making the hose fast by lashing it to the ship's side rail.
2. Crew exposure to a suspended load is vastly reduced and minimal.
3. Fingers are not exposed to the same risk when lashing the hose.
4. Passing the hose back is much safer, as personnel involvement after hooking the hose end on is virtually eliminated.
5. Minimum alterations required to operate this system.



**Floatation Hose Strings are available when bunkering to/from installations.**



**This eliminates the need to use floatation aids on the hose string.**



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| <b>Brian Smith</b>             | <b>Contracts Manager</b>                        | <b>Sparrows Offshore</b> |
| <b>Diarmid McAllister-Hall</b> | <b>HSE Advisor</b>                              | <b>Shell</b>             |
| <b>Kevin Allan</b>             | <b>Services Competency &amp; Improvement FP</b> | <b>Shell</b>             |
| <b>Kenneth Lawtie</b>          | <b>Lead Implementation Engineer</b>             | <b>Sigma3</b>            |
| <b>David Cooper</b>            | <b>VP Mechanical Handling &amp; Projects</b>    | <b>Sparrows Offshore</b> |
| <b>George Stewart</b>          | <b>Safety Coach</b>                             | <b>Sparrows Offshore</b> |
| <b>Pietro Fong</b>             | <b>Contract Support Engineer</b>                | <b>Sparrows Offshore</b> |

