

HID Inspection Guide Offshore

Inspection of Mechanical Handling & Crane Operations

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Summary

This guidance outlines an approach to the inspection of dutyholder's arrangements for the management of offshore mechanical handling operations, including crane operations and the management of offshore lifting equipment. It also sets out the criteria for satisfactory and unsatisfactory performance factors against which the dutyholder will be rated. Reference is made to technical standards and guidance that inspectors will use to form an opinion for legal compliance.

Introduction

Although in recent years there has been a reduction in the number of incidents occurring during both offshore mechanical handling operations and crane operations unfortunately they still continue to occur. Tragically some of these incidents have resulted in serious injuries and fatalities. In addition an incident during mechanical handling or crane operations can have the potential to be an initiating event for a

major accident, such as a dropped load or a failed crane boom falling onto and rupturing a vessel or pipeline containing hydrocarbons.

To ensure incidents do not occur they must be carried out in a safe manner and this can only be achieved if mechanical handling and crane operations are adequately planned, are undertaken by competent personnel, and utilise equipment that is both suitable for the task and in a safe condition.

Dutyholders must have an effective system in place for the management of mechanical handling operations and crane operations and these guidelines give inspectors guidance on how to inspect the suitability and effectiveness of a management system. This topic breaks down into ten core intervention sub topics.

An overview of how to undertake an inspection of each of these sub topics is included in the appendices. The use of this guidance will enable a consistent approach to be adopted for the inspection of these sub topics

Action

This guidance should be used by IMT Inspectors; however it may be necessary to have some input from the relevant specialist inspectors where there are technical issues on which the IMT Inspector requires guidance.

The ten core inspection sub topics are as follows:

- The planning of mechanical handling operations and crane operations
 - The management of mechanical handling operations and crane operations
 - The role of the Competent Person
 - Risk Assessments
 - Lifting Plans
 - Toolbox Talks
- The control of portable mechanical handling equipment
- The thorough examination of lifting equipment and cranes
- The maintenance and inspection of mechanical handling equipment
- The maintenance and inspection of cranes
- The training and competence, the providing of information, and the supervision of personnel involved in mechanical handling operations and crane operations.
- The undertaking of crane operations
- The undertaking of mechanical handling operations using portable lifting equipment
- The undertaking of mechanical handling operations on the drillfloor
- The lifting of personnel by cranes or winches

The details of how to undertake an inspection of each of these sub topics is given in the attached appendices. The effective inspection of these sub topics will include establishing that the dutyholders documented procedures are sufficiently robust and that the dutyholder is actually following their procedures.

Background

The main legal requirements which are applicable to Mechanical Handling and Crane Operations come from the Lifting Operations and Lifting Equipment Regulations (LOLER). These Regulations implement the lifting provisions of the Amending Directive to the Use of Work Equipment Directive. The Provision and Use of Work Equipment Regulations (PUWER) apply to all work equipment including lifting equipment but LOLER deals with the specific risks associated with lifting equipment and lifting operations.

Mechanical Handling may involve moving a load horizontally (pulling), or the raising and lowering of a load (lifting). PUWER will apply to both activities however the requirements of LOLER only become applicable when there is the raising or the lowering of a load.

LOLER applies to all lifting equipment on offshore installations and all lifting operations undertaken on offshore installations. In addition certain sections of LOLER apply to some 'specified operations' undertaken from vessels in connection with offshore installations.

The Management of Health and Safety at Work Regulations (MHSWR) brings in the requirements for risk assessments to be carried out to identify the nature and level of risks associated with mechanical handling and crane operations.

LOLER defines 'lifting equipment' as work equipment for the lifting and lowering of loads and includes its attachments used for anchoring, fixing or supporting it. 'Lifting accessories' are specific items of lifting equipment which are used to connect the load to the lifting machine (slings, shackles etc.).

PUWER requires employers to ensure that work equipment is suitable for the purpose and additionally LOLER requires that lifting equipment is of adequate strength. The requirements for the strength of items of lifting equipment are specified in the Machinery Directive within the 'essential health and safety requirements to offset the particular hazards due to a lifting operation'.

The Supply of Machinery (Safety) Regulations brings in the requirements for persons who supply lifting equipment to ensure the lifting equipment meets the Machinery Directive 'essential health and safety requirements to offset the particular hazards due to a lifting operation'. Such equipment should be CE marked and accompanied by EC declaration of conformity.

It should be noted that The Supply of Machinery (Safety) Regulations and the Machinery Directive do not apply to lifting equipment supplied for use on Mobile Offshore Drilling Units, Floating Production Units, or Floating Storage Units. However in practise non CE marked lifting equipment which meets the requirements of the Machinery Directive will generally be found on such installations together with lifting equipment manufactured to the American API standards.

Organisation

Targeting

Although the inspection may be carried out at any installation it is particularly important to carry this out for every dutyholder.

Timing

Inspections should be planned within the timescales set out by ED divisional management.

Resources

Resources for the undertaking of this inspection will come from the Inspection Management Team inspectors with support from discipline specialist inspectors

Recording & Reporting

The dutyholder performance ratings should be entered on the Inspection Rating Form (IRF) tab of the relevant Installation Intervention Plan Service Order. Findings from the inspection should be recorded in the normal post inspection report and letter

Further References

- [LOLER Regulations and ACoP](#)
- [Step Change in Safety 'Lifting and Mechanical Handling Guidelines'](#)
- [Step Change in Safety 'Best Practise Guide to Manriding Safety'](#)
- [Step Change in Safety 'Safety of Wireline Operations'](#)
- [Step Change in Safety 'Marine Transfer of Personnel'](#)
- [Offshore Safety Notice 2/2005 'Single line components in the hoisting and braking systems of offshore cranes'](#)
- [HSG 221 'Technical guidance on the safe use of lifting equipment offshore'](#)
- [SPC/ENF/152 The lifting operations and lifting equipment regulations 1998 – Offshore aspects](#)

Appendix 1 - The Planning of Mechanical Handling Operations and Crane Operations

Mechanical Handling Operations and Crane Operations

Mechanical Handling Operations are those activities which involve the movement of a load using work equipment. This work equipment can be that which is either manually operated or power operated. When a Mechanical Handling Operation requires a load to be raised or lowered then the required work equipment becomes lifting equipment and the activity can be considered to be a lifting operation. Examples of mechanical handling equipment which is not lifting equipment would be a wheeled trolley used to move a load or a trolley used to pull a load on level ground. However if such equipment is used to move a load up or down an incline then this would become a lifting operation.

Incidents have occurred with turntable types of wheeled trolleys (barrows) during the movement of loads on level ground. Wheeled trolleys in which the turntable carrying the front wheels can be turned at angles greater than 45 degrees can be prone to tipping as a result of the centre of gravity of the carried load changing as the turntable is turned.

Crane Operations are mechanical handling operations undertaken using pedestal cranes, gantry cranes, BOP cranes etc.

Legal Requirements

- The Health and Safety at Work etc Act 1974 requires a safe system of work to be in place for the mechanical handling operation.
- LOLER Reg 8 (1)(a) requires that every lifting operation involving lifting equipment is properly planned by a competent person.
- The Management Regulations Reg 3(1) requires that for every mechanical handling operation a risk assessment is undertaken to identify the hazards and the corresponding risks.
- PUWER Reg 4 requires suitable work equipment to be provided for the mechanical handling operation

Inspection Procedure

Management System

To ensure the legal requirements are met duty holders must have within their management system details of how they will ensure mechanical handling operations will be carried out in a safe manner. This should be a specific section within their management system detailing how they manage mechanical handling operations and lifting equipment. The Safety Case will also make reference to this document as being the system that will be in place to prevent dropped objects, that is dropped objects that could be an initiating event for a major accident hazard.

Inspectors should check the dutyholders management system that this specific section exists and that it is readily available to the personnel who plan lifting operations.

The fundamental starting point for any mechanical handling operation is the identification that such an activity is to take place and then that it is planned by a competent person. Only by careful planning can these activities be carried out in a safe manner. The Step Change in Safety publication, 'The Lifting and Mechanical Handling Guidelines' defines the responsibilities, training, the competencies and the assessment of those personnel involved in the lifting and mechanical handling operations and it sets out a structured approach to ensure that such operations are systematically planned and carried out in a safe manner.

Inspectors should ask dutyholders whether they are following the Step Change Guidelines or if not have they compared their current management system and working methods with these guidelines to ensure the principals have been adopted.

All personnel involved in mechanical handling operations and crane operations must have been trained, have the required experience and have been assessed as competent. This also applies to the personnel who plan and supervise these operations. The Step Change Lifting and Mechanical Handling Guidelines give guidance on the key parts of a competency scheme and refers to industry standards for training and competency, such as the OPITO standards.

Inspectors should check that dutyholders have a competency scheme in operation and that it is being followed by looking at the competency / training matrix completion dates.

Inspectors should check that the dutyholders planning process does not focus only on the lifting and lowering of a load but includes how the load will be transported to or from the point of lift. In particular when hand propelled wheeled trolleys/barrows are used how the suitability of this method of transport has been assessed and the risk assessment process relating to its use.

The Competent Person for Planning Lifting Operations

The Competent Person is someone who has the required level of competency to be able to produce written plans for the undertaking of lifting operations and be able to check and authorise plans that have been written by others. He must have the practical skills and theoretical knowledge to plan lifting operations, undertake risk assessments and conduct toolbox talks. The Competent Person may or may not supervise the lifting operation but he is the focal point for all the technical aspects associated with lifting operations and lifting equipment. He must know his own competency limitations and know when additional technical support is required and from where this can be obtained.

Inspectors should check that on the Offshore Installation being inspected that dutyholders have such a Competent Person in position. This may be a dedicated position or one in which the person undertakes both this and another role. The name

frequently given to this person is the 'Loler Focal Point', the 'Loler Competent Person' or 'The Lifting Supervisor'.

Inspectors should talk with this Competent Person and determine whether his role meets the specification described above. Should the person also undertake another role that that he is happy that he can still perform his Competent Person duties fully? Also does he know where he can obtain additional technical support when this is required?

Inspectors should establish that the Competent Person is in the Dutyholders competency scheme and that the required training / assessments are up to date.

Risk Assessments

Every mechanical handling operation and crane lifting operation must be subjected to a risk assessment as part of the planning process. This risk assessment will identify the hazards and the corresponding risks. The assessment will detail how these risks will be eliminated or adequately controlled. The risk assessment will be either produced by the Competent Person or reviewed by the Competent Person. Unfortunately risk assessments are frequently viewed as a requirement of the regulations rather than being viewed as something which is both meaningful and useful to the lifting team. A common problem is the failure is to identify site specific hazards such as those due to the proximity to other equipment and those of prevailing environmental conditions. Emphasis is instead placed on recording hazards that are common to all lifting operations which will have control measures already in place. An example would be the failure of lifting equipment with the control measure in place of only using lifting equipment which has the current colour coding applied, that is 'currently certified lifting equipment'.

Inspectors should consider the following by speaking to personnel and attending toolbox talks:

- Do the risk assessments address site specific hazards?
- How are the results of the risk assessment communicated to the members of the lifting team?
- How do the management ensure the risk assessment for repetitive (routine) tasks continue to be suitable?
- Is there any evidence of risks being 'assessed out' rather than 'engineered out'?
- How is the management of change considered i.e. when conditions change or when a change occurs in the task?
- Where applicable does the risk assessment include the use of mechanical handling aids such as wheeled trolleys and barrows?

Lifting plans

A lifting plan is the step by step instructions to be followed for carrying out the lifting operation together with details of the equipment to be used. It will either be produced by the Competent Person or it will be authorised by the Competent Person. The degree of planning can vary considerably and many dutyholders will

have systems in place to enable lifting operations to be classified as either 'routine' or 'non routine' For 'routine' lifting operations the lifting plan may be 'generic' in nature but will need to be reviewed prior to undertaking the lifting operation. For 'non routine' lifting operations they can be further classified in terms of 'simple', 'complicated' and 'complex'. A 'simple' lifting operation may not require a written lifting plan whereas a lifting plan for a 'complicated' or 'complex' lifting operation may require additional authorisation from onshore technical specialists.

The lifting plan and the risk assessment are closely linked. Many hazards can be avoided or overcome by selecting the most appropriate work equipment and choosing movement paths which avoid hazard areas. It is the hazards which remain that need to be addressed in the risk assessment. In the case of a deck lifting operation using a crane the lifting plan will be for the complete task whereas for a lifting operation using portable lifting equipment it will be probably only be a part the overall task. The overall task will have a risk assessment, a permit, isolations etc.

Inspectors should consider the following by viewing lifting plans, by speaking to personnel and by attending toolbox talks:

- Has the lifting plan been authorised by the competent person?
- Does the lifting plan clearly outline the step by step instructions for undertaking the lifting operation, the work equipment to be used and a sketch showing how it is to be installed?
- Is there a system in place for the storing of lifting plans?
- How is the lifting plan communicated to the members of the lifting team?
- If using an existing lifting plan what steps have been taken to ensure it is still suitable?
- Does the lifting plan include, where applicable, the movement of loads to and from the point of the lift?

Toolbox Talks

Before undertaking any mechanical handling operation or crane operation a toolbox talk should be held to discuss the task or tasks to be undertaken. This must include the method of undertaking the lifting operation as detailed in the lifting plan and any hazards together with the associated control measures detailed in the risk assessment. If at all possible the toolbox talk or the relevant portion of the talk should be held at the planned work site in order to facilitate easy and immediate recognition of the issues connected with the task. The toolbox talk should be managed in a manner which stimulates interest, allocates responsibilities and maximises participation. If during the discussions it is identified that a change is required to the lifting plan or risk assessment then this must be authorised by the Competent Person. Many dutyholders have toolbox talk prompt cards or risk assessment prompt cards that have to be completed during the toolbox talk.

Inspectors should consider the following points by attending toolbox talks:

- Was the lifting plan discussed and agreed?
- Was the risk assessment discussed and the required control measures implemented?

- Were site specific hazards considered?
- Were individual responsibilities allocated to the team members?
- If generic lifting plans or risk assessments were used, for example these may have been used for routine crane deck lifting operations have site specific hazards and weather conditions been discussed?
- Was the talk led by a Supervisor?
- Was the talk carried out in such a manner which allowed constructive participation of the team members?
- Was it confirmed that all the team members were fully trained and assessed as competent?
- If there are any trainees how was this managed?
- Was a prompt card used and details recorded of the persons attending?

Appendix 2 - The Control of Portable Mechanical Handling Equipment

Lifting Equipment and Lifting Accessories

Lifting Equipment is work equipment for the lifting or lowering of loads and this includes the attachments for the anchoring, fixing or supporting of it. For example a clamp that is attached onto an overhead beam onto which a chain or lever hoist is attached is lifting equipment.

Lifting Machinery can be considered to be lifting equipment which is used to lift or lower a load; examples are a chain hoist, lever hoist, a crane, a winch and a jack.

Lifting accessories are items of work equipment that are used to connect the lifting machine to the load; examples are slings, shackles, eyebolts.

Portable lifting equipment unlike fixed lifting equipment can be moved and used at different locations e.g. chain hoists, lever hoists, air hoists, beam clamps, slings and shackles.

Legal Requirements

- PUWER Reg 4 requires suitable work equipment to be provided for the mechanical handling operation.
- PUWER Reg 5 requires work equipment to be maintained in an efficient state, in efficient working order and in good repair.
- LOLER p289 implements point 3.1.5 of Annex II of AUWED which states that lifting accessories should be stored in such a way that ensures that they will not be damaged or degraded. It states you should ensure lifting accessories are stored in conditions that do not lead to damage or deterioration.
- LOLER Reg8(1)(c)) requires every lifting operation involving lifting equipment to be carried out in a safe manner, this will include pre-use checks to identify faults or damage.

Inspection Procedure

The generally accepted approach to managing portable lifting equipment offshore is by the use of a rigging loft. The common practise is to hire a rigging loft complete with contents and replace it at six monthly intervals. However a minority of dutyholders still retain their own lofts and have the contents thoroughly examined at six monthly intervals. Where the latter is the case and the lifting equipment is not changed out every six months dutyholders should have in place a policy for a finite offshore life of such lifting equipment. This is particularly relevant for chain hoists and lever hoists where both the external condition and function tests could indicate that they appear to be in a good condition but undetected age related internal wear is occurring.

It is good policy to have only one central rigging loft in operation and all equipment issued from it. For example portable equipment used on the drill floor would be

issued from this central loft . However there may be occasions when a second loft has to be used for example during construction campaigns or drilling campaigns.

The design and operation of a rigging loft is to ensure portable lifting equipment and lifting accessories are:

- stored to reduce the risk of accidental damage and slow down deterioration,
- subject to effective controls to prevent unauthorised use of the equipment,
- to ensure pre use checks are undertaken prior to use,
- removed from service when their condition has deteriorated such that they are no longer in good repair,
- and when they are removed from service they are quarantined prior to returning onshore for repair or disposal

Inspectors should check that the following arrangements are in place when assessing a dutyholders system for the control of portable lifting equipment:

- the rigging loft should be placed in a suitable location which provides adequate degree of weather protection and allows good access and egress.
- the rigging loft should be secured to prevent unauthorised access, be well illuminated and provide sufficient space to allow for uncluttered storage of the equipment.
- the rigging loft should have a quarantine bin for the storage of equipment removed from service and awaiting return onshore.
- the rigging loft should have a work bench for the inspection of equipment returned to the rigging loft after use.
- the rigging loft should be under the control of a rigging loft controller who checks equipment before issue, records each item that has been issued, records who it has been issued to and where it will be used, records when it is returned and inspects the returned equipment.
- a tee card system and a register is 'best practise' for this recording process.
- the rigging loft should have a one way system for the return of the equipment when the loft controller is not in attendance, this is to prevent anyone from taking and using the equipment before it has been checked in and examined.

Additional points that will improve the control of portable lifting equipment and enable the Inspector to award a higher assessment are:

- Additional measures that are in place for the control man-made fibre slings (webbing slings and round slings). These types of slings are easily damaged and inappropriate use can result in damage. Additional control measures could be that they can only be used by the raising of a permit and they are kept in a locked container within the loft.
- Inspections are carried out by the loft controller every week to check that lifting equipment issued from the loft is at the correct location and that it is in a good condition showing no damage or deterioration.

Appendix 3 - The Thorough Examination of Lifting Equipment and Cranes

Legal Requirements.

PUWER Reg 6(2) requires employers to ensure that work equipment that is exposed to conditions causing deterioration is inspected at suitable intervals and each time an exceptional circumstance which is liable to jeopardise the safety of the equipment has occurred. LOLER Reg 9 builds upon this requirement such that all lifting equipment must be subjected to a thorough examination and that inspections are undertaken between these thorough examinations.

LOLER Reg 9 requires lifting equipment to be thoroughly examined before being taken into use for the first time, at intervals throughout its life and after exceptional circumstances which are liable to jeopardise the safety of the equipment has occurred.

Before being taken into service for the first time - this does not apply to new lifting equipment when it is accompanied by an EC declaration of conformity that has been made no more than 12 months prior to the equipment being put into service.

At intervals during the life of the lifting equipment - LOLER allows some flexibility, examinations can be undertaken at intervals not exceeding the statutory periods of 12 months for lifting machines and six months for lifting accessories or alternatively in both cases subjected to the periods specified in a written scheme of examination. In the case of lifting machines used to lift persons the statutory period is reduced to six months but again a written scheme of examination can be used.

After exceptional circumstances have occurred which are liable to jeopardise the safety of the equipment. An example of this would be when an incident has occurred and the equipment has been subjected to an overload, which is a load above its maximum rated capacity. Some alterations and repairs which may have affected the integrity of the lifting equipment can also fall into this category. The dutyholder should advise the Competent Person who undertakes thorough examinations of such exceptional circumstances so they can assess any effects on the condition of the equipment and consider if a thorough examination is required as well as the extent of the examination.

The LOLER regulations also require that anyone using lifting equipment must be able to ascertain that it has been thoroughly examined and likely to be safe to use. The normal offshore method to achieve this is to colour code the lifting equipment. Following a thorough examination, equipment which has successfully passed the examination is marked with a colour. This colour is then changed at the next thorough examination.

The thorough examination must be undertaken by a Competent Person (a different person from the Competent Person who plans lifting operations) who has the practical knowledge and experience of the lifting equipment to be able to detect defects and assess their importance in relation to the safety and continued use of the equipment. This person must be sufficiently independent and impartial to allow

objective decisions to be made. Normal offshore practise is for this person to be employed by a separate company, eg a third party inspection company.

Proof load testing is not a requirement of the LOLER Regulations or of the Supply Regulations for new equipment. Any testing undertaken as part of the thorough examination is up to the discretion of the Competent Person. Inspectors should be aware that as a condition of 'Class' for MODU's their cranes have to be subjected to a proof load test every five years witnessed by a surveyor from the Classification Society. This testing would be done during the MODU's five yearly shipyard visit.

The majority of offshore dutyholders adopt the fixed time interval approach for thorough examinations however some have adopted a written scheme for certain types of lifting equipment. A written examination scheme should specify the intervals at which the lifting equipment, or parts of it, needs to be thoroughly examined. When developing the scheme account should have been taken of the equipment condition, the environment in which it will be used, the loads that will be lifted and the number of lifting operations that it will undertake.

Some dutyholders may have identified infrequently used lifting equipment and decided not to have it thoroughly examined. Runway beams and pad eyes are examples, however when they need to be used a thorough examination would have to be undertaken prior to their use.

LOLER Reg 9 requires the Competent Person making the thorough examination to notify the dutyholder of any defect in the lifting equipment which is or could become a danger to persons. Defective equipment would be withdrawn from service and the new colour code would not be applied. Where the defect is such that it does not warrant the immediate removal of the item from service but in time it could become a danger to persons then the Competent Person must specify a time scale for the repair of the defect. If the repairs are not completed within the specified timescale the dutyholder must then remove the item from service.

The regulation also requires that should the Competent Person identify that the defect is of such a serious nature that if someone used the lifting equipment they would be at a risk of serious personal injury then a copy of his report has to be sent to HSE, normally the focal point IMT.

Inspection Procedure

The undertaking of thorough examinations by third party inspection companies is a well established practise offshore. Where MODU's have come into the UK sector checks should be made to verify a thorough examination has been undertaken and in particular that the correct period has been applied to lifting accessories. It is not uncommon to find dutyholders who think the six month period for lifting accessories is only applicable if they are used for lifting persons.

Whilst viewing ongoing lifting activities and equipment stored in the rigging loft check that the equipment has the correct colour code applied. The current colour code should also be displayed on the station bill. If construction activities are being

undertaken using the contractors lifting equipment check to see how this equipment is identified and that it is colour coded.

The last report for thorough examination should be viewed looking specifically at the defects list. Where the Competent Person has given a time limit for the repairs to be carried out check that the dutyholder has a system in place to track the actions on these defects to ensure they are completed or that the equipment is removed from service before the specified date. It is an absolute requirement under LOLER Reg 10(3)(b) that the item is removed from service if the defect has not been rectified within the specified period.

Where specific items have not been subjected to a current thorough examination a check could be undertaken on one of these items to ensure that it does not have the current colour code applied and there is some identification to show that it cannot be used.

Appendix 4 - The Maintenance and Inspection of Mechanical Handling Equipment

Legal Requirements

PUWER Reg 5(1) builds upon the general duty in the HSW Act which requires work equipment to be maintained so that it is safe. Equipment must be maintained so that its performance does not deteriorate to the extent that it puts people at risk.

PUWER Reg 6(2) requires work equipment exposed to conditions causing deterioration which is liable to result in a dangerous situation to be inspected at suitable intervals. Examples on non-lifting equipment which fits into this category would be items such as wheeled barrows, tiffors, and transport skates.

For lifting equipment LOLER Reg 9(3)(b) replaces the PUWER Reg 6(2) requirements and states that when the risk assessment for the use of the lifting equipment has identified a significant risk to the operator or other worker from the use of the lifting equipment a suitable inspection should be carried out. In general all lifting operations pose significant risks and inspections will need to be undertaken at intervals in between the thorough examinations.

An inspection is more than an operator check under LOLER Reg 8 or a maintenance check under PUWER Reg 5. LOLER Reg 10(2)(a) requires the defects to be reported and recorded. Inspections will normally be carried out by an 'in house' employee who must be competent to identify defects and appreciate their significance. A suitable person to undertake these inspections would be a mechanic or with sufficient instruction an operator, the inspection will include both visual checks and functional checks.

Lifting accessories will generally not require an inspection as they receive a thorough examination and are subjected to pre use checks. These pre use checks will be undertaken by the user however in practise the rigging loft controller will also undertake an inspection when the equipment is returned to the rigging loft. Lifting machinery such as winches, chain hoists and lever hoists will require inspections. The rigging loft controller will undertake inspections and function tests of chain hoists and lever hoists when they are returned to the rigging loft.

Although crane pennants (a length of wire rope with an eye on one end which attaches onto the crane hook and a hook on the other end which attaches onto the load) are lifting accessories they should be subjected to inspections. Normal practise would include measuring the hook jaw gap to ensure wear has not resulted in it becoming out of tolerance requiring removal from service. The hook manufacturers give guidance on the allowable tolerances for different capacity hooks.

The inspection of a winch will include such items as the condition of the wire rope, the security of the rope onto the drum, the condition of the brakes, the correct functioning of the brakes, the correct operation of the winch controls and the security of the foundation bolts.

The maintenance requirements for work equipment will be managed through the dutyholders maintenance system. This should be based upon the recommendations of the manufacturer. In practise for lifting equipment the maintenance routines and inspection activities can become merged into daily, weekly, monthly etc maintenance work orders.

The maintenance undertaken on portable lifting machinery such as chain hoists and lever hoists is generally limited to greasing and oiling. If a damaged hook or lifting chain is found the item would be quarantined and returned onshore for repair. When the rigging loft is changed out portable lifting machinery will be either scrapped or subjected to a full overhaul, this would entail stripping down, replacement of worn components, the subsequent rebuilding and full testing before being returned offshore in a rigging loft

Inspection Procedure

Select an item(s) of lifting equipment and check that maintenance activities are documented and are being carried out. Similarly check that the required inspections are being undertaken and are documented.

For crane pennants identify whether inspections are being carried out and that they include checking the hook jaw gaps. This is particularly important when pennants are not given a finite offshore life.

Appendix 5 - The Maintenance and Inspection of Cranes

Offshore Crane Types

There is a wide range in the types of cranes used offshore from a few remaining of the very first generation of offshore cranes with mechanical drives using friction clutches to the later designs of offshore cranes which have hydraulic or electric drives. HSG 221 'Technical guidance on the safe use of lifting equipment offshore' gives details of the crane types and the safety features that should be incorporated in the crane design.

Legal Requirements

PUWER Reg 5(1) builds upon the general duty in the HSW Act which requires work equipment to be maintained so that it is safe. Equipment must be maintained so that its performance does not deteriorate to the extent that it puts people at risk.

LOLER Reg 9(3)(b) states that when the risk assessment for the use of the lifting equipment has identified a significant risk to the operator or other worker from the use of the lifting equipment a suitable inspection should be carried out. All crane operations pose significant risks and inspections will need to be undertaken at intervals in between the thorough examinations.

An inspection is more than a pre use check under LOLER Reg 8 or a maintenance check under PUWER Reg 5. LOLER Reg 10(2)(a) requires the defects to be reported and recorded. Inspections will normally be carried out by an 'in house' employee who must be competent to identify defects and appreciate their significance. A suitable person may be a mechanic or with sufficient instruction an operator, the inspection will include visual and functional checks.

Following the publication of Offshore Safety Notice 2/2005 'Single line components in the hoisting and braking systems of offshore cranes' dutyholders should have reviewed the design of their cranes to ensure they have identified whether any single line components exist in the hoisting and braking systems. A single line component or system would be an item that should it fail would result in the uncontrolled lowering of the load or of the crane boom. Techniques such as 'failure mode effects criticality analysis' (FMECA) can be employed. Where such components or systems are identified dutyholders need to ensure that the maintenance and inspection activities undertaken on these components and systems are sufficient in terms of frequency and scope to ensure continued safe operation.

Maintenance

To ensure the safe and satisfactory operation of any crane a planned maintenance system should be in place and be properly implemented. Maintenance routines historically have been based upon the manufacturer's instructions and carried out at the stated intervals. Modern maintenance routines for offshore cranes are now normally based upon the results of a FMECA study where the maintenance routines are put in place as mitigation against recognised component failure modes. The frequency of the maintenance routines is driven by the known failure rates for the

equipment components. The maintenance should only be carried out by personnel who have adequate knowledge of how the maintenance procedures should be undertaken.

A technique employed by many dutyholders is to have a regular condition evaluation undertaken by either the crane manufacturer or a specialist crane maintenance company. This is commonly done on an annual basis and can include both functional testing and performance testing of major components such as winch motors.

Inspections

In practise the maintenance routines and inspection activities for cranes can become merged together into daily, weekly, monthly, etc., maintenance work orders. In addition some of the pre use checks undertaken by the crane operator on a daily basis can be considered to be inspections. Generally speaking inspection activities are applied to all components where a single point of failure mode exists. The important aspects are ensuring these inspection routines are sufficient and are aligned with the outcomes of a FMECA or a similar study, that they are undertaken at the correct intervals and any defects found are corrected.

Some of the inspections on winch motors and the condition of the driving splines between the motor to gearbox and gearbox to winch drum are frequently undertaken by a specialist crane maintenance company at the prescribed intervals. Many dutyholders extend this such that other than the daily and weekly inspections all other inspections together with maintenance activities are undertaken by a 3rd party crane service provider.

Inspection Procedure

Interrogate the maintenance system to determine whether the maintenance routines for the cranes are being completed in a timely manner. In instances where maintenance routines have been deferred look to see the justification for the deferral. This is particularly relevant where the maintenance activity relates to a 'single line component' or a 'single line system'

Look at the crane operators daily inspection check list to ensure an inspection check list exists, that it is being completed and that actions are being taken to address any defects that have been found. If the content of the completed daily check lists are not recorded in the maintenance scheme they should be retained for at least the period of the current thorough examination. This will allow the competent person undertaking the thorough examination to review these should he consider it necessary.

Look at the additional inspections undertaken on a weekly, monthly, 3 monthly and longer periods. Are these inspections being completed in a timely manner and corrective actions taken on any recorded defects. These inspections may be undertaken by the operator or by a mechanic and will include inspections of the wire ropes, the rope terminations, rope sheaves for wear or damage, checks on the operation of the rated capacity indicator (safe load indicator), visual checks on the

hook and swivels, visual checks on the boom structure. Critical checks should be also made on the amount of wear on slew ring bearings (rocking motion tests) and on the condition and security of slew ring bolts.

Talk to the crane operators to see whether they voice any concerns relating to the condition and the operation of the cranes. Have these concerns been documented, for example in the daily inspection checks and what steps have been taken to address the concerns.

Visit a crane and make a general evaluation of the condition of the crane, probing the crane operator if required.

Ask the crane operator to demonstrate the undertaking some of the inspections (pre use checks) such as the operation of load hoist upper limit, the boom hoist upper limit and the boom lower limit.

Where crane condition evaluations are being undertaken by third parties look at the recommendations in one of the recent reports. Look for evidence that there is a system in operation to implement any recommendations and for those that have not been implemented that an evaluation has been undertaken to justify the non implementation.

Appendix 6 - The training and competence, the providing of information and the supervision of personnel involved in mechanical handling operations and crane operations

Legal Requirements

PUWER Reg 8 requires employers to ensure persons who use work equipment to have where appropriate written instructions on the use of the work equipment. This builds on the general duty in the HSW Act to provide employees with the information and instructions that are necessary to ensure so far as reasonably practicable, their health and safety.

PUWER Reg 9 requires employers to ensure persons who use work equipment have received adequate training including training in the methods which may be adopted when using the work equipment.

LOLER Reg 8 requires lifting operations to be carried out in a safe manner and appropriately supervised.

Competency Schemes

To ensure lifting and mechanical handling operations are carried out in a safe manner they must be planned by competent persons and undertaken by personnel who have received adequate training and have gained sufficient operational experience of these operations, such that following an assessment they can be deemed to be competent.

The Step Change in Safety, 'Mechanical Handling Guidelines' identifies the four key stages that an individual has to pass through to reach full competency. Although not a legal requirement these guidelines are recognised as the accepted industry practice. The stages are:

- ***Initial Training***

This would be generally undertaken at an onshore training establishment and will include a written assessment to ensure the learning outcomes have been achieved

- ***Workplace Experience***

This is 'on the job' supervised training and the practical application of the learning obtained in stage 1. Generally the trainee will undertake tasks documented in a log book, the tasks will then be signed off by a supervisor.

- ***Competency Assessment***

When the workplace experience is completed, eg a completed log book, the trainee will be ready for assessment. This assessment can be undertaken

onshore or offshore and may include a written test. Successfully completing this assessment will allow the trainee to be considered as competent.

- ***Re-assessment of competence***

To ensure continued competence a re-assessment in some form is required. For personnel undertaking lifting operations this is generally at two yearly intervals.

Opito have a full range of training and competency standards for personnel who undertake lifting operations and also an assessment standard for persons who plan lifting operations. These standards are generally directed towards personnel on production installations and not those on drilling installations. However on drilling installations the standards for crane operators, banksman/slingers and the competent person for planning lifting operations can still be used. It is common that drilling dutyholders will have their own 'on the job training and assessment schemes' which may incorporate parts of the Opito standards.

Information and Instructions

Dutyholders should have available the relevant manufacturers instructions relating to mechanical handling equipment to which users of the equipment can easily make reference. Personnel will need to be trained in the use of the mechanical handling equipment but on occasions may need to refer to the manufacturers instructions. The competent person planning a lifting operation may also need access to these documents as part of undertaking the selection process of the lifting equipment to be used.

Generic instructions and guidance are also commonly provided to personnel undertaking lifting operations; these are in the form of pocket sized handbooks to which reference can be made.

Supervision

Both the HSWAct and LOLER require appropriate supervision to be provided. Appropriate supervision means that it should be proportionate to the risk and take account of the personnel who will be undertaking the mechanical handling operations. The levels of supervision will be determined by the nature of the work and the competence of the personnel who will be involved in using the equipment. For lifting operations the Lift Supervisor is the person in direct control of the lifting operation and the lifting team at site. This will generally be one of the lifting team, normally the Banksman. The Banksman is also responsible for directing and communicating to the lifting machine operator.

In the case of complex lifting operations additional supervision and direction may be required and this will be the Competent Person who has planned the lifting operation.

Persons undergoing training (trainees) need close supervision and this will be from a member of the team. Only after trainees have been assessed as competent can they work unsupervised.

Persons who are new to the Installation (green hats) will also need a degree of supervision; they may be competent in the role but will not be familiar with the other team members, their approach to the task and communicating with each other.

Inspection Procedure

- Check that the dutyholder has a competency scheme in place covering all the persons that undertake mechanical handling and crane operations.
- Does the scheme require periodic re-assessments?
- Is the scheme up to date, that is are the training and assessments being undertaken at the correct periods?
- Discuss with individuals the training and assessments they have undertaken.
- Are the manufacturer's instructions for the use of work equipment readily available?
- Do personnel know where they can access these instructions?
- Are pocket sized handbooks issued to give basic guidance in use?
- Is there a system in place that will identify when additional supervision is required for a lifting operation?
- Is there a policy in place to restrict the numbers of trainees that can be in a team?
- Is there a policy in place for the length of time a person is considered to be a 'green hat'? Is it a fixed period or is it open to the discretion of the supervisor?

Appendix 7 - The undertaking of Crane operations

Legal Requirements

The legal requirements relating to the planning and risk assessment process for a crane lifting operation are documented in Appendix 1 of these guidelines.

LOLER Reg (1)(c) requires an employer to ensure every lifting operation is carried out in a safe manner.

Undertaking crane operations

To ensure offshore crane operations are carried out in a safe manner they should only be undertaken by a team comprising of a minimum of three persons, the crane operator, a banksman and a slinger.

The crane operator is responsible for the correct operation of the crane and undertaking the pre use checks on the crane. The crane operator should at any one time only respond to the signals of one banksman. These signals from the banksman can be by either hand signals or radio signals.

The slinger (may also be termed the load handler) is the person who has the responsibility of attaching/detaching and securing the loads to the lifting equipment.

The banksman (may also be termed the lift supervisor or signaller) is the person who controls the initial lifting of the load and then at its final positioning at the landing site. He gives signals to the slinger for the attaching and detaching of the load to the crane pennant and gives signals to the crane operator for the movement of the crane. The banksman should not get involved in the physical positioning of the load or of the attaching or removing of the load from the crane pennant. He must retain an overview of the lifting operation. The banksman must be easily identified from other personnel by the wearing of a high visibility jacket or waistcoat which is clearly marked with the words 'Banksman'.

Once the load is lifted clear of the deck the person in control of the lifting operation is the crane operator. When the load then approaches the landing area the banksman resumes control. Where the distances or deck levels between the pickup and laydown areas are significant a second team with a second banksman and slingers can be employed to speed up the operations.

A significant proportion of the loads lifted offshore can be classified as long loads such as drilling tubulars. In practice this would require a slinger at each end of the load to undertake the attaching/detaching. It is therefore normal offshore practice for a crane lifting operations team to comprise of four persons, which is the crane operator, a banksman and two slingers.

For any crane operation the two principal hazards to personnel are those of being struck from a dropped load and being struck from a swinging load. A dropped load can result from the failure of the lifting equipment or the collapsing of the load being lifted. A swinging load is the result a sudden stopping or moving of the load, movement of the crane due to sea state or wind, operator error, or the load becoming caught and suddenly freeing itself. These two hazards are well known and they should be addressed in the risk assessment, they should also be engrained into the minds of slingers and banksmen. The area below the load in which a falling load may drop, or the area around a load to where it can swing, is frequently termed the 'danger zone'.

For the first hazard the policy should always be where practicable not to lift loads over persons or over areas occupied by persons. Where this is not reasonably practicable then protection measures should be in place or a safe system of work in place to exclude persons from the 'danger zone'. Protection measures would be such that areas occupied by persons such as office modules are built with dropped objects protection but if this is not provided then persons should be moved out of these modules before lifting operations commence. For general deck lifting operations a safe system of work would include the provision of barriers and/or warning signs to prevent persons from walking under loads or into the areas where lifting operations are being undertaken.

For the second hazard the control measure in place is that persons should not be inside the 'danger zone'. Tag lines are sometimes attached to long or awkward loads to assist in the controlling and positioning the load as it is landed, a typical example would be bundles of drilling tubulars. These must be attached to the load and be of sufficient length that the slingers are able to use them to control the load whilst standing outside the 'danger zone' although there may be occasions when they move slightly inside it.

If the slingers move into the edges of the 'danger zone' their training and experience should be such that they always ensure they have an escape route, that is a route to a 'position of safety' should the load drop or swing.

To correctly position a load being landed slingers will frequently use their hands to push against the load. When this practise is adopted this should not be undertaken until the load is below waist height and great care should be taken against pinch points, that is hands are not positioned on the corners of the load. Some dutyholders enforce a 'no hands' policy through the use of 'push-pull' sticks. These sticks are designed with one end shaped to push against flat surfaces or onto the corners of containers whilst the other end has a hook to grab sling sets or tag lines.

Offshore installations can be very congested which may result in some laydown areas and the routes that loads may have to take not being in the direct line of sight of the crane operator. When this is the case these are known as 'blind lifts'. If hand signals are being used this will require more than one banksman. When radio communication is used the banksman should give continuous instructions to the crane operator such as lower-lower-lower and should there be a failure to give these continuous instructions the crane operator should cease all crane movements.

Many cranes are now fitted with boom tip cameras which can be of great benefit to the crane operator in blind lifting operations when trying to position and centralise the crane hook relative to the load. However it is important that the crane operator still follows the instructions from the banksman and does not rely totally on the image from the boom tip camera.

The route for personnel to gain access to or egress from the crane should be posted giving clear directions. Persons may only access or leave the crane with the operator's permission. If the boarding or leaving point is out of the sight of the crane operator a system should be in operation such that the crane operator will not start to operate the crane until he has received a visual signal from these persons that it is safe to do so.

Bulk hose handling can be a hazardous activity, particularly for those who are involved in the hooking on/off of the hoses on the installation and to those persons undertaking similar roles on the supply vessel. Overhead protection frames or cages should be erected at bulk hose handling stations to protect personnel in the event that a hose becomes detached from the crane or from the lifting accessories.

The Toolbox Talk

Before undertaking any crane lifting operation a toolbox talk should be held to discuss the task or tasks to be undertaken. Where there are a number of similar loads to be lifted and these are normal 'deck lifting operations' then one toolbox talk can be held. An example of this would be the offloading of a supply boat. All personnel who will be involved in these lifting operations should attend the toolbox talk.

The toolbox talk will be a discussion of the tasks to be undertaken, the lifting plan and the risk assessment, particularly any site or load specific hazards. It should allocate specific responsibilities, i.e. who will be the banksman, the slingers. It will identify individual specific tasks, e.g. pre use checks of the lifting accessories, checking that personnel are out of the area and that barriers are in place.

For supply boat operations it will include a discussion of the boat manifest, the location of the loads on the vessel deck, their weight and the laydown areas where they have to be landed. It will also include the loads to be back loaded and in what sequence. A common practise is that a deck plan of the supply boat showing the location of the loads is forwarded after the vessel leaves port and this assists in the discussions. During supply boat operations the crane operator will have direct radio communication with the vessel master.

Inspection procedure

A good approach is to start by attending the start of shift meeting to find out what lifting activities are planned to be undertaken during the shift, then attend the toolbox talk for crane operations. This can be followed by observing the team preparing to undertake the lifting operations, which is the selection of the lifting accessories, the pre use checks on the crane and on the lifting accessories. Then observing the

team undertaking a number of lifting operations, view these from various deck positions and from the crane cab.

The Toolbox Talk

- Were the specific tasks to be undertaken fully discussed, including the relevant lifting plans and risk assessments?
- If the tasks involved supply boat operations was the cargo manifest discussed together with the laydown areas to be used?
- For the specific laydown areas to be used was consideration given to discussing any site specific hazards and the specific control measures.
- Was it identified who would be the banksman and who would be the slingers?
- Was consideration given to current environmental conditions and whether suitable control measures needed to be implemented?
- Was the method of communication between the banksman and crane operator agreed?
- If there were any new team members or trainees was this identified together with who would be supervising them?

Preparation for the lifting operations

- Was it identified which capacity and length of crane pennants would be required for the loads to be lifted?
- Was someone tasked to check the laydown areas for site specific hazards?
- For loads to be 'back loaded' was someone allocated to check them for security and potential dropped objects?
- Was someone allocated to check that all personnel are outside the areas in which the lifting operations are to be undertaken and that a means of preventing persons entering these areas is in place?
- Was the banksman clearly identifiable by wearing a high visibility vest with 'banksman' written on?
- Was there a tannoy announcement made that lifting operations were about to commence?

Pre use checks

- Has the crane operator undertaken his pre use checks?
- Where radios are to be used for the communication between the banksman and crane operator has their operation been checked?
- Where supply boat operations are to be undertaken has the radio communication between the crane operator and vessel master been checked?
- Have the pre use checks on the crane pennants been undertaken?
- Where the pennant is to be used for supply boat operations is it sheathed with a high visibility cover?

Observations from Deck Level

- Is the banksman standing back from the lifting operation, in such a position to have a clear view of the load and the slingers, giving instructions to the slingers and crane operator?
- Is the banksman restricting his activities to only controlling the lifting operation and not getting involved in the slinging activities or in the controlling of the load?
- Are the slingers positioning themselves such that they are outside the 'danger zone' and if they should enter into the edges of this zone they have an escape route?
- Where a 'no hands' policy is not in place for the placing of loads as they are landed are the slingers ensuring they do not make contact with the loads until they are below waist height?
- If tag lines are being used are they attached to the load and not the slings? Are they of sufficient length to allow the slingers to control the load without them entering the 'danger zone'?
- Where bulk hose handling is being undertaken are the banksman and slingers positioned outside the 'danger zone' and outside any areas where there is a potential for entanglement with hoses? If they have to enter the 'danger zone' are they protected by overhead frames or cages?

Observations from the Crane

- Are good clear signals and distinct signals been received from the banksman?
- Where radios are being used is a clear and effective radio protocol in operation? The crane operator and the banksman on receiving a message should use the word 'rodger' to indicate the message has been received and understood
- Where part of the lifting operation is a 'blind lifting operation' and radio communication is being used is the banksman giving continuous instructions to the crane operator such as lower-lower-lower and if there is a failure in receiving these continuous instructions the crane operator stops the crane movements?
- In the case of a 'blind lifting operation' and the crane is fitted with a boom tip camera is the crane operator making use of this camera in centralising the crane hook relative to the load?
- Do the control measures to prevent persons entering the areas where the lifting operations are being undertaken appear to be working?
- Is the crane operator moving the loads such that they are not lifted over persons or unprotected areas that are occupied by persons?
- If bulk hose handling operations are being undertaken is the crane operator exercising extreme caution when deploying/recovering the hoses between the installation and the supply boat to ensure no snagging occurs? Also does the crane operator have a clear view of the hose landing area on the vessel deck?

- Is the crane operator able to explain the actions he must take relating to the crane boom positioning prior to and during helicopter operations?

Post Job Debrief and Shift Handovers

- Was a post job debrief undertaken to confirm the job/s have gone according to plan or to identify any issues that arose so they can be addressed?
- Did everyone involved in the lifting operation have the opportunity to discuss and suggest any improvements to the lifting plan? Any suggested changes would need to be reviewed by the competent person and actioned as appropriate. For example this may include feedback on equipment effectiveness, lifting techniques, etc.
- Is there a system in place to ensure that any suggested changes are recorded, evaluated and if suitable implemented?
- Are shift handovers undertaken? Who undertakes these? Are they structured and recorded?

Appendix 8 - The undertaking of mechanical handling operations using portable lifting equipment

Legal Requirements

The legal requirements relating to the planning and risk assessment process for mechanical handling operations are documented in Appendix 1 of these guidelines.

LOLER Reg (1)(c) requires an employer to ensure every lifting operation is carried out in a safe manner.

The undertaking of mechanical handling operations

To ensure mechanical handling operations using portable lifting equipment are carried out in a safe manner they must only be undertaken by personnel who have been assessed as being competent. Generally on fixed platforms in the offshore industry this will be undertaken only by riggers. Some dutyholders in their classification of lifting operations may allow 'simple' lifting operations to be undertaken by personnel other than riggers, such as mechanics and electricians, who have received suitable training and have been assessed as competent to undertake these types of lifting operations. The most common training and assessment standard used is the Opito Rigger Standard Stages 1 to 4.

The Dutyholders with mobile offshore drilling units will generally not have riggers but will have nominated personnel who can undertake lifting operations using portable lifting equipment. These personnel will have received suitable training and assessment as detailed in the dutyholders competency scheme.

The Toolbox talk

Prior to the commencement of the lifting operation a toolbox talk should be held. All the personnel who will be involved in the undertaking of the lifting operation should attend. This should be a discussion of the method of undertaking the lifting operation as detailed in the lifting plan and of any control measures that are identified in the task risk assessment for the lifting operation.

The lifting operation using the portable lifting equipment may be only a part of the overall task, with the overall task having a risk assessment, a permit, isolations etc.

If at all possible the toolbox talk or relevant portion of the talk should be held at the proposed site in order to facilitate easy and immediate recognition of the issues connected with the task.

At the toolbox talk individual responsibilities will be allocated including the identification of the lift supervisor. That is the person who will be in control of the lifting operation.

The toolbox talk process should be managed in a manner which stimulates interest, allocates responsibilities and maximises participation. Toolbox talk prompt cards for lifting operations should be used in this process.

If after discussion a change is required to the lifting plan or task risk assessment the Competent Person (for planning lifting operations) will need to approve these before undertaking the lifting operation.

Inspection procedure

A good approach is to start by attending the start of shift meeting to find out what lifting activities using portable lifting equipment are planned to be undertaken during the shift, and then attend the toolbox talk for one of these activities. This can be followed by observing the team preparing and undertaking the lifting operation. The lifting operation may be a new one or the continuation of an existing one.

The Toolbox Talk

- The toolbox talk should be held at the worksite? If not why was this?
- Was the lifting plan or the relevant part of the lifting plan discussed?
- Where the lifting equipment requires rigging up was it discussed how this would be done?
- Was everyone in agreement with the lifting plan and if not what actions were taken to address this?
- Did the discussions consider whether there were any site specific hazards or weather related hazards? Where such hazards have been identified did the team identify suitable control measures?
- If the lifting operation involves the transportation of the load did the team look at the route the load must take or arrange for someone to walk the route to ensure there are no additional hazards?
- Did the toolbox talk allocate specific responsibilities to the team members and identify who would be in control of the lifting operation?
- Where applicable did the toolbox talk discuss other hazards associated with the task and the control measures that had to be in place i.e., isolations, inhibits, manual handling, working at height, confined space?
- Was the method of communication discussed and agreed?
- If there are any new team members or trainees was this identified together with who would be supervising them?
- Was the toolbox talk managed in a manner which stimulated interest and maximised participation?

Preparation for the lifting operation

- Was the lifting equipment rigged up as detailed the lifting plan?
- Was scaffolding/ladders/rope access available for the installation and dismantling of the lifting equipment?
- Were pre use checks undertaken on the lifting equipment?

- Was someone allocated to check that all personnel are outside the area in which the lifting operation was to be carried out?
- Were barriers and warning signs put in place to prevent persons entering the area in which the lifting operation is to be conducted?
- Was there a tannoy announcement made that lifting operations were to commence?

Undertaking the lifting operation

- Was the lifting operation undertaken in the manner documented in the lifting plan
- Did the control measures to prevent persons entering the areas where the lifting operations are being undertaken appear to be working?
- Was the lifting operation undertaken in a manner such that the team was continually evaluating risk?
- If during this continually evaluating risk process an unforeseen hazard was identified was the lifting operation halted when safe to do so and not recommenced until suitable controls were in place?

Post Job Debrief and Shift Handovers

- Was a post job debrief undertaken to confirm the job/s have gone according to plan or to identify any issues that arose so they can be addressed?
- Did everyone involved in the lifting operation have the opportunity to discuss and suggest any improvements to the lifting plan? Any suggested changes would need to be reviewed by the competent person and actioned as appropriate. For example this may include feedback on equipment effectiveness, lifting techniques, etc.
- Is there a system in place to ensure that any suggested changes are recorded, evaluated and if suitable implemented?
- Are shift handovers undertaken? Who undertakes these? Are they structured and recorded?

Appendix 9 - The undertaking of mechanical handling operations on the drillfloor

Legal Requirements

The majority of drilling operations involve some aspect of the lifting and lowering of loads using lifting equipment. This can range from the topdrive and draw works lifting and lowering the drill string, to the transferring of tubulars between the piperacks and the drillfloor using cranes/winches or dedicated handling systems, to the undertaking of manriding operations using winches.

- The HSW Act. requires that a safe system of work to be in place for these operations.
- LOLER Reg 8(1) requires these operations are properly planned by a competent person, appropriately supervised and carried out in a safe manner.
- The Management Regulations Reg 3(1) requires that for these operations a risk assessment is undertaken to identify the hazards and the corresponding risks.
- PUWER Reg 4 requires that suitable work equipment is provided for these operations.

The undertaking of mechanical handling operations on the drillfloor

To ensure mechanical handling operations using lifting equipment are carried out in a safe manner they must only be undertaken by personnel who have been assessed as being competent. The dutyholder should have a competency scheme in place which details the training requirements together with the assessment requirements for all personnel who will be undertaking mechanical handling operations.

Wireline operations are mechanical handling operations, the rigging up and rigging down of wireline sheaves, lubricators and toolstrings are lifting operations. When a dropped toolstring is contained within the well bore/lubricator there is little risk to personnel but when dropped outwith these areas there is the potential risk for serious or fatal injuries to personnel. To ensure these activities are undertaken in a safe manner a wireline operations plan should be in place and undertaken by competent personnel. The Step Change in Safety publication, 'Safety of Wireline Operations' gives guidance on industry best practice.

The Toolbox talk

Prior to the commencement of the mechanical handling operations on the drillfloor a toolbox talk should be held. All the personnel who will be involved in the undertaking of the mechanical handling operation should attend. This should be a discussion of the method of undertaking the task as detailed in the written procedure and the completion of a basic risk assessment.

Inspection procedure

Attend the start of shift meeting to identify what drilling activities are to be undertaken then attend the relevant toolbox talk.

The Toolbox Talk

- Was the toolbox talk attended by all the team members
- Were the written procedures for the task to be undertaken discussed?
- Was a basic risk assessment such as following a TRIC (Toolbox Talk Risk Identification Card) or a Risk Assessment Prompt Card undertaken and documented?
- Was there a system in place and followed to confirm that a basic risk assessment was sufficient for the task?
- If there are any new team members or trainees was this identified together with who would be supervising them?
- Was the toolbox talk managed in a manner which stimulated interest and maximised participation?

The lifting equipment

- Check that loose lifting equipment such as shackles and wire rope slings have been issued from the main rigging loft and that it has been recorded as in use on the drill floor. (Unless a dedicated rigging loft has been supplied for a drilling campaign, see p13)
- Could the current colour coding be readily observed on all the lifting equipment?
- If lifting nubbins are used are they colour coded?
- Were the wire rope slings in use in a good condition with no broken wires or no severe kinking?
- Do the wire ropes fitted to the winches appear to be in good condition?
- Are these wire ropes correctly scrolled onto the winch drums with no severe bunching or kinking?
- Do the winches appear to be a good condition?
- Is there a good standard of guarding on the winches?
- Do the winch brakes appear to be in a good condition with no obvious oil/grease contamination of the brake shoes or brake paths?
- Are the shackles, those which can be observed as being in use, have their pins fitted with the correct securing system?

Undertaking the lifting operations

- Were pre use inspections of the equipment undertaken?
- Were the written procedures as discussed at the toolbox talk followed? If not why was this?
- Did it appear the written procedures as discussed at the toolbox talk were followed?

- Did the team members appear to be operating the equipment correctly and in safe positions?

Post Job Debrief and Shift Handovers

- Was a post job debrief undertaken to confirm the job/s had gone according to plan?
- Did everyone involved in the job/s have the opportunity to discuss and suggest any improvements?
- Is there a system in place to ensure that any suggested changes are recorded, evaluated and if suitable implemented?
- Are shift handovers undertaken? Who undertakes these? Are they structured and recorded?

If an inspection of wireline operations is to be undertaken compare the systems in place with that documented in the Step Change in Safety publication, '[Safety of Wireline Operations](#)'.

Appendix 10 - The lifting of personnel by cranes or winches

The lifting of personnel offshore may be required for the carrying out of a work activity or for the transfer of personnel. The carrying out of a work activity can be with personnel working from a work basket which is raised or lowered by a crane to a person in a harness being lifted and lowered by a winch. The transfer of personnel would be by a crane lifting and lowering personnel in a personnel carrier between an offshore Installation and a vessel.

Legal Requirements

The HSW Act. requires that a safe system of work to be in place for these operations. Some dutyholders do not allow the lifting of persons by either winches or cranes. Where dutyholders allow such activities to be undertaken the system of work should include documented procedures for these activities.

LOLER Reg 5 specifies that the raising and lowering of people by work equipment which is not specifically designed for the purposes should only be undertaken in exceptional circumstances, when it is not practical to gain access by less hazardous means. Where it is necessary to use such work equipment then all necessary precautions are taken to ensure safety, including appropriate supervision.

HSG 221 gives basic guidance on these necessary precautions in terms of the features a crane should have to enable it to be considered as suitable for the lifting of personnel in such exceptional circumstances. The term 'exceptional circumstances' would be such as those in an emergency for the transfer of a casualty to a supply boat or when helicopters cannot be used as part of an installation evacuation.

Cranes that are to be used for the repeated transfer of personnel such as during 'marine transfer' activities should only be those which have been specifically designed to undertake the lifting of personnel. This can be achieved by having cranes built to the European Standard BS EN 13852-1: 2004 'Offshore Cranes' or when existing cranes have been upgraded to meet the requirements for the lifting of personnel detailed in this standard. This should also apply to cranes lifting work baskets where such activities need to be undertaken on a regular basis and therefore could not be considered to be only undertaken in exceptional circumstances.

HSG 221 also gives guidance on the features a winch should have to enable it to be considered as suitable for the transfer of personnel (lifting a personnel carrier) and the lifting of personnel to undertake work activities. In the case of lifting personnel to undertake work activities from a manriding harness or a bosun's chair, both of which offer no protection to the person being lifted, then only purpose designed manriding winches should be employed.

All cranes and winches used to lift persons should be clearly marked 'Suitable for lifting people' or 'Suitable for manriding'.

LOLER Reg 5 also specifies that the personnel carrier must be designed such that it will prevent a person using it from being crushed, trapped, stuck or falling from the carrier. The more recent types of personnel carriers have been designed to minimise the risk to persons from these hazards whereas the original rope netting personnel baskets in which personnel stood on the outside and held on did not.

LOLER Reg 5 also gives details of the essential features that work baskets must possess and further information is given in the British Standard EN 14502-1 'Suspended Baskets' and in HSG221. Work baskets must be clearly marked with the maximum number of persons that can be carried and the rated capacity.

The Supply of Machinery (Safety) Regulations brings in the requirements for persons who supply personnel carriers and work baskets to ensure the equipment meets the Machinery Directive 'essential health and safety requirements to offset the particular hazards due to a lifting operation'. Such equipment should be CE marked and accompanied by an EC declaration of conformity. It should be noted that although these Regulations do not apply to Mobile Offshore Drilling Units, Floating Production Units, or Floating Storage Units in general such equipment found on these Units will probably still be CE marked.

The Management Regulations Reg 3(1) requires that for lifting of personnel operations a risk assessment is undertaken to identify the hazards and the corresponding risks.

The undertaking of the lifting of personnel by cranes or winches

Other than for the 'marine transfer' of personnel before any lifting of personnel is undertaken it must be established that it is absolutely necessary to lift personnel and there are no alternative methods of performing the task.

To ensure the lifting of personnel operations are carried out in a safe manner they must only be undertaken by personnel who have been assessed as being competent and by only using equipment which has been certified as suitable for the lifting of personnel. The dutyholder should have a competency scheme in place which details the training requirements for the personnel who will be involved in the undertaking of personnel lifting activities together with the assessment requirements to demonstrate competence.

The Toolbox talk

Prior to the commencement of the activity which involves the lifting of personnel a toolbox talk should be held. All the personnel who will be involved in the undertaking of the lifting operation should attend. This should be a discussion of the task to be undertaken, the written procedures for the task including the specific procedures and check lists required for the lifting of personnel and the risk assessment.

Inspection procedure for the transfer of personnel

It is very unlikely that an offshore inspection will coincide with the transfer of personnel so the inspection will focus on reviewing the procedures that are in place and the equipment provided should such activities be undertaken.

- Where personnel transfer activities are only undertaken in 'exceptional circumstances' is it documented that the crane is suitable based upon the basic recommendations in HSG 221?
- Are there documented procedures in place which have to be followed when such personnel transfers in 'exceptional circumstances' are to be undertaken?
- Where personnel transfer activities may be undertaken on a regular basis, that is for the 'marine transfer' of personnel, is it documented that the crane has been built to the European Standard BS EN 13852-1: 2004 'Offshore Cranes' including the requirements for the lifting personnel, or it is documented that the crane has been upgraded to meet the requirements for the lifting of personnel as detailed in this standard?
- Where the latter is the case is the crane marked as marked 'Suitable for lifting people' or 'Suitable for manriding'?
- Where the crane is marked as 'Suitable for lifting people' or 'Suitable for manriding' there will be a system in place for the emergency lowering of the load in the event of loss of power. Check that periodic tests are being undertaken to verify the correct operation of this system.
- Where personnel transfer activities may be undertaken on a regular basis are there documented procedures in place and have these incorporated the Step Change in Safety, 'Marine Transfer Guidelines'?
- Does the personnel carrier clearly display the maximum number of persons that can be carried and the rated capacity?
- Is the personnel carrier marked to show that it has been thoroughly examined?
- If the Supply Regulations apply to the Installation does the personnel carrier have CE marking and a Declaration of Conformity?

Inspection procedure for work activities that are carried out by the use of a work basket

It is very unlikely that an offshore inspection will coincide with the use of a work basket so the inspection should focus on reviewing the procedures that are in place and the equipment provided should such activities be undertaken.

- Where the use of the workbasket is only undertaken in 'exceptional circumstances' is it documented that the crane is suitable based upon the basic recommendations in HSG 221?
- Are there documented procedures in place which have to be followed when the work basket is used in 'exceptional circumstances'?
- Where the use of the work basket is undertaken on a regular basis, is it documented that the crane has been built to the European Standard BS EN 13852-1: 2004 'Offshore Cranes' including the requirements for the lifting personnel, or it is documented that the crane has been upgraded to meet the requirements for the lifting of personnel as detailed in this standard?

- Where the latter is the case is the crane marked as marked 'Suitable for lifting people' or 'Suitable for manriding'?
- Where the crane is marked as 'Suitable for lifting people' or 'Suitable for manriding' there will be a system in place for the emergency lowering of the load in the event of loss of power. Check that periodic tests are being undertaken to verify the correct operation of this system.
- Has the workbasket been designed to meet the requirements of BS EN 14502-1 'Suspended Baskets'? If the Supply Regulations apply to the Installation does the personnel carrier have CE marking and a Declaration of Conformity?
- If the workbasket has not been designed to BS EN 14502-1 has the design been compared to this standard to ensure the significant hazards and hazardous situations have been addressed?
- Does the workbasket clearly display the maximum number of persons that can be carried and the rated capacity?
- Is the workbasket marked to show that it has been thoroughly examined?
- Are there documented procedures in place which have to be followed before and during the use of the workbasket?

Inspection procedure for work activities that are carried out by the use of a manriding harness

Work activities undertaken by a person lifted up in a manriding harness will generally be associated with drilling operations and will be undertaken from the drillfloor or the moonpool. These activities must only be undertaken by the use of dedicated manriding winches whose only duty is for the lifting of persons. The specification of these winches will include a limitation on the maximum pull (generally 150kg) and have adjustable upper and lower hoist limits. Manriding winches used on floating drilling installations will have additional features such as ability to maintain a constant tension to compensate for the heave of the installation.

- Can the dutyholder confirm that the manriding procedures in place follow or adopt the principals in the Step Change in Safety Publication, 'Best Practise Guide to Manriding Safety'?
- If manriding is to be undertaken during the inspection start by attending the toolbox talk and check that the documented procedures are being followed?
- Manriding harnesses are lifting accessories and these should be thoroughly examined or renewed before a thorough examination is required. Check that the dutyholder has listed these as lifting accessories, that in service inspections are undertaken and pre use checks are undertaken.
- Are the winches clearly marked as 'only suitable for manriding' and colour coded to show they have been thoroughly examined?
- There will be a system in place for the emergency lowering of personnel in the event of loss of power. Check that periodic tests are being undertaken to verify the correct operation of this system
- Do the winches appear to be in a good condition with correct operation of control lever, the slack rope trip system and the brakes?
- Have the upper and lower hoist limits been set to match the manriding applications on the Installation?

- Where manriding winches are used infrequently it is good practise to fit covers to give protection from the elements. Has this been done?
- Look at the maintenance system to see whether the maintenance on the winches is being carried out and there are no deferrals.
- The winch manufacturer will most probably recommend a finite offshore life before the onshore overhaul and testing of the winch. Has the dutyholder implemented the recommendations or if not why not and what is in place?

Appendix 11 Performance Assessment

EMM RISK GAP					
EXTREME	SUBSTANTIAL	MODERATE	NOMINAL	NONE	NONE
TOPIC PERFORMANCE SCORE					
60	50	40	30	20	10
Unacceptable	Very Poor	Poor	Broadly Compliant	Fully Compliant	Exemplary
<p>Unacceptably far below relevant minimum legal requirements.</p> <p>Most success criteria are not met.</p> <p>Degree of non-compliance extreme and widespread.</p> <p>Failure to recognise issues, their significance, and to demonstrate adequate commitment to take remedial action.</p>	<p>Substantially below the relevant minimum legal requirements.</p> <p>Many success criteria are not fully met.</p> <p>Degree of non-compliance substantial. Failures not recognised, with limited commitment to take remedial action.</p>	<p>Significantly below the relevant minimum legal requirements.</p> <p>Several success criteria are not fully met.</p> <p>Degree of non-compliance significant.</p> <p>Limited recognition of the essential relevant components of effective health and safety management, but demonstrate commitment to take remedial action</p>	<p>Meets most of the relevant minimum legal requirements.</p> <p>Most success criteria are fully met.</p> <p>Degree of non-compliance minor and easily remedied.</p> <p>Management recognise essential relevant components of effective health and safety management, and commitment to improve standards.</p>	<p>Meets the relevant minimum legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent and able to demonstrate adequate identification of the principal risks, implementation of the necessary control measures, confirmation that these are used effectively; and subject to review.</p>	<p>Exceeds the relevant minimal legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent, enthusiastic, and proactive in devising and implementing effective safety management system to 'good practice' or above standard. Actively seek to further improve standards.</p>
EMM INITIAL ENFORCEMENT EXPECTATION					
Prosecution / Enforcement Notice.	Enforcement Notice / Letter.	Enforcement Notice / Letter.	Letter / Verbal warning.	None.	None.