

## **CODE OF PRACTICE**

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# **Atlantic Canada Offshore Petroleum Industry Safe Lifting Practice Respecting the Design, Operation and Maintenance of Materials Handling Equipment**

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(Replaces Publication 2013-0012)

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# 1. Overview

## 1.1 Purpose and Scope

The *Accord Act(s)* (reference to federal version only) provides the authority for the Chief Safety Officer (CSO) to mandate that an operator or employer put an OHS Code of Practice (CoP) in place, or adopt one chosen by the CSO, with respect to any workplaces or the transportation of employees to or from such workplaces. Ultimately, the operator has responsibility to ensure workplace health and safety.

This Safe Lifting Practice (SLP) is to be adopted by Operators as a CoP to assist those with responsibilities under the *Accord Acts* to better understand industry best practices and expectations related to materials handling equipment e.g., offshore pedestal cranes, Containers, drilling hoisting equipment, loose lifting gear, and other lifting devices) and safe lifting operations on Marine Installations and Structures operating in the Atlantic Canada Offshore Petroleum Area.

The aim of the SLP is to prevent injury to persons by providing a document to assist operators, employers and other workplace parties to comply with their responsibilities under Part III.1 of the *Accord Act(s)* in relation to “materials handling equipment” as prescribed by Part 24 of the *OHS Regulations*.

Incorporation and use of materials handling equipment into a management system is a key component of the SLP. Operators and employers must: exercise due diligence to ensure all related equipment is fit for its intended purpose; ensure appropriate procedures are in place, workers are properly trained and competent to perform lifting operations safely; and must describe how this has been achieved in any application for authorization. If “materials handling equipment” is not appropriately designed, constructed, installed, operated, maintained, inspected or tested, injury or fatality to one or more persons could occur.

The SLP does not include all regulatory requirements and measures identified as a result of hazard identification and risk assessment processes.

Information contained in the SLP should not be read in isolation. This document is intended to complement an individual operator and/or service provider’s procedures as well as legislative and regulatory requirements. In the event of any inconsistency or conflict between this document and the regulations, the regulations prevail.

This SLP will be updated from time to time to consider new technology and regulatory developments.

The development of this SLP included consultation with all stakeholders engaged in the Atlantic Canada offshore petroleum industry, including service providers, suppliers, employees/employers, and the Boards. The Terms of Reference for the Working Group that developed this document is in Appendix 1.

## 1.2 Legislative Authority

The following regulations<sup>1</sup> apply to materials handling equipment and operations on Marine Installation or Structures operating in the Atlantic Canada Offshore Petroleum Area:

- *Canada-Newfoundland and Labrador Accord Implementation Act*
- *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*
- *Canada-Newfoundland and Labrador Offshore Area Occupational Health and Safety Regulations*
- *Canada-Nova Scotia Offshore Area Occupational Health and Safety Regulations*
- *Newfoundland Offshore Petroleum Drilling and Production Regulations*
- *Nova Scotia Offshore Petroleum Drilling and Production Regulations*
- *Newfoundland Offshore Petroleum Installation Regulations*
- *Nova Scotia Offshore Petroleum Installations Regulations*
- *Newfoundland Offshore Certificate of Fitness Regulations*
- *Nova Scotia Offshore Certificate of Fitness Regulations*

Equivalencies or substitutions to the regulatory requirements, including standards referenced in regulations, may be granted on a case-by-case basis through the Boards' "regulatory query processes." However, exemptions requested under the regulatory query process are limited to Part III of the Accord Act(s) given exemptions are not permitted for Part III.1 regulatory requirements. Please refer to the Boards' websites for a description of their regulatory query processes.

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<sup>1</sup> Newfoundland and Labrador and Nova Scotia regulations primarily contain the same technical content and reference the same codes, standards and rules. It should be noted that only the Federal version of the Act(s) and Regulation(s) are listed above for simplicity.

### 1.3 Terms and Definitions

For the purpose of this document, the following terms and definitions apply:

Accord Act(s)	<p>Refers to:</p> <ul style="list-style-type: none"> <li>• Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act (CNSOPRAIA)</li> <li>• Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act</li> <li>• Canada-Newfoundland and Labrador Atlantic Accord Implementation Act (C-NLAAIA)</li> <li>• Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act</li> </ul>
Atlantic Canada Offshore Petroleum Area	The Atlantic Canada Offshore Petroleum Area refers to the Offshore Area(s) as defined by the Accord Act(s).
Banksman	Refers to a “signaller” as defined and referenced in the OHS Regulations.
Boards	Canada-Newfoundland and Labrador Offshore Petroleum Board and Canada-Nova Scotia Offshore Petroleum Board.
Certifying Authority	As defined in the Certificate of Fitness Regulations for “installations”.
Competent Person	<p>Competent Person is as defined in the <i>“Occupational Health and Safety Regulations”</i>, and demonstrates the following:</p> <ul style="list-style-type: none"> <li>• ability to troubleshoot and solve problems that impact safety and asset integrity,</li> <li>• able to detect defects or weaknesses during inspection of equipment and assess their importance as to the safety of such equipment and the user,</li> <li>• able to recognize when specialists’ advice and assistance is necessary, and</li> <li>• capable of judging or supporting the opinions of others.</li> </ul>



Crane Operator	Qualified Crane Operator for an offshore crane as referenced in API RP 2D.
Container	Refers to a “portable unit for repeated use in transport of goods or equipment, handled in open seas, to, from or between fixed and/or floating installations and ships” as defined in ISO 10855-1 and DNV-ST-E271. Includes transportable items such as tanks, tote tanks, cutting boxes, x-mas tree transport frames, coiled tubing units and skids.
Installation	An accommodations installation, drilling installation, diving installation or production installation as defined in the Installation Regulation(s).
Loose Lifting Gear	Any accessory by means of which a load can be attached to a lifting appliance but that does not form an integral part of the appliance or load.
Marine Installation or Structure	Refers to a “Marine Installation or Structure” as defined in the Accord Act(s).
Materials Handling Equipment	Refers to “materials handling equipment” as defined in section 1 of the OHS Regulations.
OHS Regulations	<i>Canada-Newfoundland and Labrador Offshore Area Occupational Health and Safety Regulations and the Canada-Nova Scotia Offshore Area Occupational Health and Safety Regulations</i>
Operator	The holder of an authorization by either the Canada-Newfoundland and Labrador or the Canada-Nova Scotia Offshore Petroleum Board.
Payload	Maximum permitted weight of the cargo that may be safely transported in the Container.
Personnel	For the purpose of this document personnel refers to providers of service, suppliers, employers and employees.
Personnel Transfer	Refers to a “personnel transfer” as defined in section 114 of the OHS Regulations.
Portable	Refers to a unit intended for offshore use but does not meet the

Offshore Unit	definition of “Container” as defined above. Portable Offshore Units are not designed to carry goods (general cargo) as their primary function but may be used for equipment that is not possible/impractical to transport in a Container. Portable Offshore Units may be designed for subsea use, single transport events, and/or units with a safe working load (SWL) up to 100,000 kg.
Provider of Services	Refers to “provider of services” as defined in the Accord Act(s). This includes any person, such as a Third-Party Inspector defined herein.
Safe Working Load	Refers to “rated capacity” as defined and referenced in the OHS Regulations.
Supplier	Refers to a “supplier” as defined in the Accord Act(s).
Workplace	Refers to a “workplace” as defined in the Accord Act(s).

## 1.4 Abbreviations

ABS	American Bureau of Shipping
AISC	American Institute of Steel Construction
API	American Petroleum Institute
API RP	American Petroleum Institute, Recommended Practice
API Spec	American Petroleum Institute, Specification
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BS	British Standard
CA	Certifying Authority
CGSB	Canadian General Standards Board
CNLAIA	Canada Newfoundland and Labrador Atlantic Accord Implementation Act
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CNSOPRAIA	Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
CSA	Canadian Standards Association
DIN	Din Deutsches Institut fur Normung E.V.
DNV	Det Norske Veritas
EN	Européen de Normalisation (European Standard)
EVITA	Carl Stahl EVITA Ltd.
IADC	International Association of Drilling Contractors
IMCA	International Marine Contractors Association
IMDG	International Marine Dangerous Goods Code
IMO	International Maritime Organization
IOGP	International Association of Oil and Gas Producers
ISO	International Standards Organization
LR	Lloyd's Register Group
NDE	Nondestructive Examination
NEC	National Electrical Code
OEM	Original Equipment Manufacturer
SLI	Safe Load Indicator
SOLAS	International Convention for the Safety of Life at Sea
SWL	Safe Working Load
TDG	Transportation of Dangerous Goods Act and Regulations, Transport Canada

## **1.5 Roles and Responsibilities**

### **1.5.1 Operators and Employers**

Operators and employers are responsible for implementing this Safe Lifting Practice within their management system and/or OHS program for their authorized activities. They also have a duty to ensure all materials handling equipment are designed, inspected, tested, maintained, and operated by competent personnel. They are also responsible for conducting audits and inspections at the workplace to verify compliance and to identify opportunities for improvement.

### **1.5.2 C-NLOPB and CNSOPB**

The Canada-Newfoundland and Labrador and the Canada-Nova Scotia Offshore Petroleum Boards use this Safe Lifting Practice as a benchmark in assessing the safety of works or activities prior to issuing an authorization, and their ongoing compliance verification and monitoring of operations in the Atlantic Canada Offshore Petroleum Area.

### **1.5.3 Certifying Authority**

The designated Certifying Authority for any Marine Installation or Structure requiring a Certificate of Fitness (e.g., drilling, production, accommodation, and diving installations) has the responsibility for verifying the design, inspection, testing and maintenance of certain pieces of materials handling equipment as part of the Certificate of Fitness process.

The Certifying Authority for Containers and Portable Offshore Units has the responsibility for ensuring that such equipment complies with the standards to which these units have been certified.

### **1.5.4 Handlers and Users of Materials Handling Equipment**

Handlers and users of materials handling equipment intended for use offshore, whether at an onshore site or at the offshore workplace, have the responsibility to ensure that the equipment with which they are working has been certified and marked in accordance with the management system, has been visually inspected for damage or corrosion and meets the current colour coding.

Handlers and users of materials handling equipment are responsible for ensuring the operation and maintenance of equipment is conducted in accordance with the management system.

### **1.5.5 Crane Operator (Offshore Crane)**

The Crane Operator is responsible for: maintaining the crane log; performing daily crane inspection, testing, and maintaining the crane in accordance with API RP 2D (or other standard accepted by the Boards) and the manufacturer's recommendations; performing lift operations in accordance with documented procedures; and ensuring that cranes and materials handling equipment are operated safely. Whenever there is any doubt as to safety, the Crane Operator has the authority to stop and refuse to handle loads or continue operations as safety dictates.

### **1.5.6 Banksman**

The banksman is responsible for: ensuring the load is properly prepared for the lift and the lift area is clear of personnel and obstructions; relaying instructions to the Crane Operator during operations with a crane or to the handler or user of other materials handling equipment, if required; and maintaining an overview of the lifting operations area, including potential areas where the equipment (e.g. boom) may come in contact with fixed equipment or a structure.

### **1.5.7 Rigger (Load Handler)**

The rigger is responsible for: ensuring that the rigging arrangements are suitable for the intended lift; connecting and disconnecting the load from the materials handling equipment; and positioning the rigging for easy access after the load has been set down.

### **1.5.8 Providers of Services**

Providers of Services are responsible in accordance with the Accord Act(s) to ensure that no individual at a workplace or on a passenger craft is endangered as a result of the services provided in connection with the workplace or passenger craft. Service providers are responsible to ensure personnel who perform work or services at the workplace have the necessary qualifications and certifications, that any information provided in connection with services is accurate and sufficiently complete, and the advice provided in performing the service does not contravene the occupational health and safety legislation.

### **1.5.9 Suppliers**

Manufacturers and Suppliers of lifting devices referenced in this Safe Lifting Practice are responsible in accordance with the Accord Act(s) to ensure that any materials or equipment delivered to the onshore site or offshore workplace is

designed, manufactured, tested, marked, and where applicable, certified, and maintained to meet the requirements described in this Safe Lifting CoP, and to any other requested requirements.

### 1.5.10 Third-Party Inspectors

Personnel or companies with the assigned responsibility for providing services for all materials handling equipment as prescribed by Part 119 of the *OHS Regulations* should meet the test of the Competent Person as defined in this Safe Lifting CoP. In addition, they should have the following valid EVITA certification or equivalent:

- Rope Examiners, and
- Lifting Gear Inspection.

Inspectors performing NDE work should have CGSB qualifications or other recognized equivalent for the relevant NDE technique.

Third-Party Inspectors have the responsibility for inspecting in accordance with the applicable code, standard, rule, or specification.

### 1.5.11 Crane Inspectors for Offshore Pedestal Cranes

Crane inspectors assigned the responsibility for all or part of the quarterly and annual inspections of cranes as defined in API RP 2D should meet the test of the Competent Person as defined in this Safe Lifting Practice. To be considered competent, inspectors should have:

- A technical degree, diploma, or certificate. Examples of technical training include, but are not limited to the following:
  - An engineering degree in a relevant discipline
  - A journeymen trades certificate in a relevant discipline
  - A technologist certificate in a relevant discipline
  - A third-class marine engineer or above;
- Theoretical and practical training as described in API RP 2D-2; and
- Training and at least one year of experience with the particular crane(s) or crane type(s) and particular aspects they have been assigned to inspect (e.g., electrical, instrumentation, mechanical and structural).

Crane Inspectors for Offshore Pedestal Cranes have responsibility for inspecting in accordance with the applicable code, standard, rule, or specification.

## 2 Offshore Cranes

### 2.1 Codes and Standards for Offshore Cranes

Typically, there are four types of offshore cranes installed on Marine Installations and Structures operating in the Atlantic Canada Offshore Petroleum Area. For other types of cranes (e.g., BOP cranes, gantry cranes, etc.), refer to section 3 and 6 of this CoP. The requirements in the OHS Regulations with respect to “materials handling equipment” and “cranes” apply to offshore cranes.

The design of all offshore cranes should consider all foreseeable site-specific physical and environmental conditions, or any foreseeable combination of physical and environmental conditions at the intended location. Pre-defined limits for the offshore crane’s safe operation and storage should be readily available.

In accordance with the *Accord Act(s)* and associated regulations, operators and employers must conduct risk assessment(s) prior to and during operations for any relevant health or safety hazards. Offshore cranes involved in the handling of lifesaving appliances or diving systems may not be covered by the standards referenced below and as such, the rules of the flag state and classification society will need to be applied. In addition to the codes and standards outlined below, operators and employers are required to meet other requirements within the *Accord Act(s)* and the regulations.

The four general types of offshore cranes and the associated codes and standards that have been accepted for the design and construction of offshore cranes in the Atlantic Canada Offshore Petroleum Area are listed below. Other standards may be considered by the Boards on a case-by-case basis if the operator can demonstrate that an equivalent level of safety is being achieved.

#### 2.1.1 Offshore Cranes (Type A)

Lifting appliances mounted on a Marine Installation or Structure (either a bottom-supported, floating unit or vessel) that is used at open sea on a floating unit or vessel, or when there may be motion relative to the other vessel or unit during a crane operation, are considered Offshore Cranes (Type A). They are also referred to as “offshore pedestal cranes” in the OHS Regulations. Any of the following standards are acceptable for this type of crane:

- ABS Guide for Certification of Lifting Appliances.
- API Spec 2C – Specification for Offshore Pedestal Cranes.
- DNV-ST-0378 – Offshore and Platform Lifting Appliances.

- EN 13852-1: Cranes - Offshore Cranes - Part 1: General purpose offshore cranes.
- Lloyd's Register, Code for Lifting Appliances in a Marine Environment.

**Note:** Additional guidance is provided in IOGP Supplementary Specification to EN 13852-1 General-purpose offshore cranes (Specification S-617) and IOGP Supplementary Specification to API Specification 2C Offshore Pedestal Mounted Cranes (Specification S-618).

### 2.1.2 Shipboard Cranes (Type B)

Lifting appliances mounted on surface-type vessels, used for crane operations that move cargo while the vessel is within a harbour or sheltered area under limited environmental conditions, or cranes mounted on a bottom-supported Marine Installation or Structure that performs no lifts to another floating unit or vessel, are considered Shipboard Cranes (Type B). Any of the following standards are acceptable for this type of crane:

- ABS Guide for Certification of Lifting Appliances.
- API Spec 2C - Specification for Offshore Pedestal Cranes.
- DNV-ST-0377 - Shipboard Lifting Appliances.
- EN 13852-1: Cranes - Offshore Cranes - Part 1: General purpose offshore cranes.
- Lloyd's Register, Code for Lifting Appliances in a Marine Environment.

### 2.1.3 Subsea Lift Cranes (Type C)

Lifting appliances mounted on a Marine Installation or Structure that are designed to lower a load through the splash zone into the water column and are either held at an intermediate level, lowered to or released on the seabed, or retrieved back to the vessel, are considered Subsea Lift Cranes (Type C). Any of the following standards are acceptable for this type of crane:

- ABS Guide for Certification of Lifting Appliances or equivalent.
- API Spec 2C - Specification for Offshore Pedestal Cranes.
- DNV-RP-N201 Lifting appliances used in Subsea Operations or equivalent.
- DNV-ST-0378 - Offshore and Platform Lifting Appliances, (vessels with class notation "Crane Vessel," "Crane" or "Crane (N)" or equivalent).
- Lloyd's Register, Code for Lifting Appliances in a Marine Environment.



## 2.1.4 Heavy Lift Cranes (Type D)

Lifting appliances mounted on barges, semi-submersibles or other vessels, used for lifting and moving loads of not less than 1570 kN (160 tf, 352800 lbf) in construction operations in open sea in limited environmental conditions are considered Heavy Lift Cranes (Type D). Any of the following standards are acceptable for this type of crane:

- ABS Guide for Certification of Lifting Appliances.
- API Spec 2C - Specification for Offshore Pedestal Cranes.
- DNV-ST-0378 - Offshore and Platform Lifting Appliances (vessels with class notation "Crane Vessel," "Crane" or "Crane (N)" or equivalent).
- EN 13852-2: Cranes - Offshore Cranes - Part 2: Floating Cranes.
- ISO 19901-6- Petroleum and natural gas industries - Specific requirements for offshore structures - Part 6: Marine operations.
- Lloyd's Register, Rules and Regulations for the Classification of Offshore Units, incorporating Notice No. 1 - Part 3 Functional Unit Types and Special Features - Chapter 18 Crane Units.

## 2.1.5 General Operations and Maintenance for all Crane Types

In addition to incorporating the requirements of the equipment manufacturer for the safe operation and maintenance of offshore cranes, and the requirements in the OHS Regulations with respect to "materials handling equipment" and "cranes", the following codes should be considered, where applicable, for the operation and maintenance of offshore cranes:

- API RP 2D, Operation and Maintenance of Offshore Cranes.
- EN 13852-1: Cranes - Offshore Cranes - Part 1: General purpose offshore cranes.
- IMCA D 060/LR 006 Guidelines for Lifting Operations, which includes subsea lifting and lifting operations in the renewable energy sector.
- IOGP Report No. 376 Lifting and Hoisting Safety Recommended Practice.
- NORSOK R-003 Safe Use of Lifting Equipment.
- Construction, transportation, installation, decommissioning, redeployment and the removal of an installation, as well modifications to existing structures, should be done in accordance with ISO 19901-6 - Petroleum and natural gas industries - Specific requirements for offshore structures - Part 6: Marine operations.

## **2.1 Additional Design Requirements for Offshore Cranes (Type A) on an Offshore Installation**

The following design requirements should be considered for operation on an offshore installation (i.e. a Marine Installation or Structure requiring a Certificate of Fitness) in the Atlantic Canada Offshore Petroleum Area to address any difference with the above codes or any ambiguity with respect to their application.

### **2.2.1. Safe Load Indicator (SLI)**

An electronic safe load indicator with the following features:

- A display showing SWL at any hook radius.
- A display showing a percentage of SWL on hook at any hook radius.
- Alarm settings programmed in the SLI determined by the installation owner's Competent Person and agreed by the Certifying Authority.
- Load curves programmed in the SLI reflecting all operating modes. For example, static (onboard), dynamic (outboard) and personnel as determined by the installation owner's Competent Person and agreed by the Certifying Authority.
- Programmed using International System (SI) of Units.
- A data recorder for continuous logging of main operational data for the purpose of tracking usage, events, overload alarms, changes in operational parameters, etc. for the purposes of determining duty and load cycles or for reviewing events.

### **2.2.2. Hoist Block**

The hoist block should have a sealed bearing or external lubrication system.

### **2.2.3. Load Hook Latches Lifts other than Personnel Lifts**

All load hoist blocks are equipped with a spring-loaded latch or equivalent means to prevent shedding of the load from the hook.

ASME B30.10 self-locking eye hooks equipped with triggers that have a device preventing the trigger from being accidentally activated meet the intent of the OHS Regulations.

#### **2.2.4. Load Hook Latches for Personnel Lifts**

Load blocks used to lift personnel are equipped with a hook that has a spring-loaded latch that can be positively locked in the closed position with the insertion of a pin or other similar device.

Secondary retention should also be considered as long as it is not in contravention of the manufacturer's requirements for the Personnel Transfer device and the crane and accepted by a Competent Person.

#### **2.2.5. Personnel Lifting**

In addition to the hoists being approved by the hoist manufacturer for personnel lifting, the Certifying Authority for an Installation must verify that the crane in its entirety has been approved for personnel lifting in accordance with the Certificate of Fitness process.

#### **2.2.6. Brakes**

All hoists (boom, main or auxiliary) used to lift personnel should be equipped with at least two operationally and functionally independent brakes, which act simultaneously. At least one of the brakes should act directly on the drum or act independently of the main drive system. If the configuration is such that the brakes are not operationally and functionally independent, the geared transmission between the braking systems and the drum should be designed as brake components and should incorporate some level of redundancy in low load conditions.

All hoists used to lift personnel should be fitted with braking systems that enable independent testing of each individual braking mechanism.

#### **2.2.7. Drums**

In consultation with the crane manufacturer, a method should be provided to secure running wire to the winding drum such that it will pull out or away if a predetermined overload is reached. This may be due to the load hook snagging on a fixed object or supply vessel and is to be operable in conjunction with other safety systems.

### **2.2.8. Boom Tip Camera**

Where the crane operator's full view of a loading area is restricted, a boom tip camera can assist the crane operators view of crane motions, lifting accessories, obstructions, landing areas, etc. A boom tip camera does not remove the reliance of close proximity that occurs between the crane operator and Banksman.

### **2.2.9. Communications**

Communication equipment should be provided to enable the crane operator to communicate with the Marine Installation or Structure, support craft and other personnel involved in the lifting operation. The crane operator shall be able to operate the radio communication system without having to move their hands from the main control levers.

In addition, an audible signaling device shall be provided within easy reach of the crane operator.

### **2.2.10. Dropped Objects**

on-welded components and equipment attached to the crane structure shall be assessed for the risk of unintended detachment and a "dropped object" hazard. Any component or attached equipment that has a risk of becoming a dropped object should be secured by means of secondary retention.

### **2.2.11. Slack Rope Indicator**

Cranes should be equipped with a device that detects slack wire rope at the hoisting and luffing hoists and gives an alarm to the crane operator.

### **2.2.12. Anemometer**

The crane should be fitted with an anemometer that provides a continuous visual readout to the crane operator and is located such that the measured wind is representative of conditions experienced by the crane at that location.

### **2.2.13. Inclinometer**

Cranes that are located onboard floating installations should be fitted with an inclinometer where trim and list have been determined to affect the safe operation of the crane. If not equipped with an inclinometer, heave, pitch

and roll references for safe operations of cranes shall be monitored throughout operations by personnel.

#### **2.2.14. Slewing Torque Indicator**

Cranes with a slewing torque safety limit that can be exceeded due to the motion of the installation on which they are mounted should be equipped with a slew torque indicating device giving continuous information of the actual slew torque to the crane operator.

#### **2.2.15. Slewing Limits**

Cranes that have a restricted slewing range due to the vessel or the platform layout should be programmed with slewing limits, which will automatically stop the slewing motion when the limit is reached.

#### **2.2.16. Boom Limits**

Cranes should be fitted with:

- Low and high boom angle limiters.
- Boom down overload alarm and limit with capability to bring the boom back to a safe condition.

#### **2.2.17. Anti-Two-Block (Over Hoist Limit)**

The anti-two-block system should be designed to ensure no damage can be sustained to the running wire or other components.

#### **2.2.18. Emergency Load Lowering**

An emergency load lowering system, using either permanent or loose items such as hand-held hydraulic tools, should be provided on all cranes. The emergency load lowering system should be capable of lowering any load to a safe location in a time period not to exceed 60 minutes. The emergency load lowering system should be available at all times and tested annually.

#### **2.2.19. Emergency Slewing**

An emergency slewing system using either permanent or other equipment, and personnel instructed in the system's use, should be available in case of power failure.

### **2.2.20. Thermal Effects**

Where the crane, and in particular the wire ropes, electric cabling or hydraulic hoses are subject to heat from flares, burner booms, turbine exhaust, etc., measures should be taken to prevent contact with thermal effect(s) and measures put in place to conduct further inspections if the crane has been exposed.

### **2.2.21. Access**

A safe means of access should be provided for the inspection and maintenance of the boom tip and other critical components.

### **2.2.22. Wire Ropes**

All wire ropes should meet the crane manufacturer's technical specifications and be installed in accordance with recommendations of the wire rope and crane manufacturer. Any rope that differs from these specifications or recommendations should be approved by the manufacturer(s) and the Certifying Authority.

### **2.2.23. Gross Overload Protection**

Gross overload protection system shall be installed if it is used to move persons or things to or from a supply vessel.

## **2.3 Inspection, Testing and Maintenance of Offshore Cranes (Type A)**

In addition to the requirements outlined in Section 2.1.5, the considerations below are to be applied in particular to an Offshore Crane (Type A) on a drilling, production or accommodation installation. Other Marine Installation(s) or Structure(s) should consider this best practice.

### **2.3.1. Assessment of Failure Mechanisms**

In accordance with the regulations, cranes are to be designed and constructed to prevent failures of any part of the material handling equipment that result in loss of control of the equipment or create a hazard. As part of the development of a preventative maintenance system, an assessment of the failure mechanisms of all critical components should be undertaken to ensure that a prudent regime is in place to inspect and detect credible failure mechanisms. The preventative maintenance system should take into consideration the recommendations of the equipment manufacturer.

### **2.3.2. Wire Rope/Rope Sheaves**

Inspection, repair and replacement criteria should be established taking into consideration manufacturer recommendations, recommended industry practice, actual duty cycles (frequency and magnitude of loads lifted) and the physical and environmental conditions under which it is being operated. Boom wire ropes should be replaced at least once every two years, or more frequently as necessary, based on the condition of the rope.

### **2.3.3. Hoists**

Inspection and overhaul criteria should be established, taking into consideration manufacturer recommendations, recommended industry practice, actual duty cycles (frequency and magnitude of loads lifted) and the physical and environmental conditions under which the hoists are being operated.

### **2.3.4. Hydraulic System**

Criteria should be established to inspect and replace critical components of the hydraulic system that may result in failure, taking into consideration manufacturer recommendations and recommended industry practice.

### **2.3.5. Operational Data**

Recorded operational data from the cranes should be retained such that it can be reviewed and used for the purpose of reviewing past events or incidents or to determine an appropriate replacement cycle for critical components.

### **2.3.6. Thorough Inspections**

A thorough inspection should be performed to the standard to which the crane was certified or based on its duty cycle as per API RP 2D, whichever is more strict. In addition to all of the inspections and tests specified in API RP 2D, the requirements of the manufacturer and the Certifying Authority should be taken into consideration. This test should also incorporate the following:

- Testing of the emergency load lowering system.
- Calibration of the safe load indicator (SLI).
- Independent testing of braking systems.

### **2.3.7. Overload Tests**

An overload test should be conducted in accordance with the Certifying Authority not less than once every five years (or every four years, if required by flag state) and should be conducted in appropriate environmental conditions. Prior to the test, a thorough inspection and non-destructive examination should be conducted to provide assurance that the crane can undergo the test safely. During the overload test, all operations, safety functions and braking mechanisms should be tested, and results of these tests recorded to provide assurance that the crane operates as per its original design. Following the test, a thorough inspection and non-destructive examination should be conducted to provide assurance that the crane can continue to operate safely.

## **3 Drilling Hoisting Equipment**

### **3.1 General Guidance**

#### **3.1.1. Codes, Standards, Rules and Specifications**

For greater clarity, drilling hoisting equipment is considered “materials handling equipment” in the OHS Regulations. Table 3-1 lists acceptable codes, standards, rules, and specifications for the different types of drilling hoisting equipment as well as any additional guidance and documentation. For any Marine Installation or Structure engaged in well operations, the design, construction, installation or commissioning should be acceptable to the Certifying Authority.

#### **3.1.2. Certification and Documentation**

The general guidance for certification and documentation for drilling hoisting equipment are provided below. Additional guidance specific to different types of drilling hoisting equipment are included in Table 3-1. Also, refer to Table 6-1 for other types of drilling hoisting equipment not listed below.

##### **3.1.2.1 Markings**

The following information is to be marked on the equipment:

- SWL or working load limit.



- Unique identification mark such as a serial number or manufacturer's traceability number.
- Devices intended for personnel lifts to be marked "For Personnel Lifting Only."

### 3.1.2.2 Documentation

The certificate and documentation for the equipment (in relation to lifting only) should include:

- Description of the material and heat treatment if applicable for all parts of the equipment.
- Code, standard or industrial practice to which the design, fabrication and testing of the equipment supplied complies.
- Date of manufacture.
- Proof load test applied (as per manufacturer's recommendation).
- Testing information including name of person declaring test has been performed; date and place of test; model, serial number, and last date of calibration of testing machine; and code, standard or industrial practice to which the testing equipment complies.
- Statement of conformity issued by the Certifying Authority if greater than 10 tonnes.
- Design and manufacturing traceability information as applicable, including:
  - Destruct test results of batch or prototype indicating actual and nominal breaking load.
  - Batch production number if applicable.
  - Temperature rating.
  - Inspection certificate as per EN10204 type 3.2 to be issued by the Independent Third Party for any equipment that is directly in the load path that lifts more than 10 tonnes, or as agreed upon by the Certifying Authority.

In addition, the certification and documentation should also include the mechanical and electrical hazardous area rating.

**Table 3-1 Recognized standards and key consideration for Drilling Hoisting Equipment**

Description	Reference Code /Standard/Rules	Key considerations
Derrick, Masts, Substructures	<ul style="list-style-type: none"> <li>• API Spec 4F, (ISO 13626) and ISO 19900 series of standards</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	<p>Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration, as follows:</p> <ul style="list-style-type: none"> <li>• minimum design temperature for operating in winter</li> <li>• increased dead-load and wind induced load due to the accumulation of ice and snow</li> <li>• loading due to fastener pre-stress</li> <li>• where it is anticipated that operational conditions warrant, with a setback load greater than indicated in API Spec 4F</li> <li>• where operations will be conducted at wind speeds higher than indicated in API Spec 4F, to withstand at least the maximum wind speed at which operations will be conducted; and</li> <li>• such that the static and, in the case of floating drilling installations, dynamic loadings which form the basis for the design equal or exceed the loads which may be imposed on the derrick during the drilling program.</li> </ul>
BOP Handling and Riser Handling Systems	<ul style="list-style-type: none"> <li>• API Spec 7K (ISO 14693) and API RP 7L</li> <li>• DNV-OS-E101 and DNV-ST-0378</li> <li>• ABS Guide for the Classification</li> </ul>	<ul style="list-style-type: none"> <li>• Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.</li> <li>• As much as practicably reasonable, all components of the system are to be designed</li> </ul>

	of Drilling Systems	such that if any one of the components fails it will not result in loss of a load. <ul style="list-style-type: none"> <li>• Brakes are to be of a fail-safe design.</li> </ul>
Horizontal Pipe Handling	Refer to Cranes – Overhead and Gantry in Table 6-1 or other applicable sections.	
Hoists used for Personnel Lifting	Refer to Hoists (stand-alone) – personnel lifting in Table 6-1	
<b>Conventional Hoisting Systems</b>		
Drawworks and Auxiliary Braking System	<ul style="list-style-type: none"> <li>• API Spec 7K (ISO 14693) or API Spec 7F chain-drive drawworks assemblies only</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.</li> <li>• As much as practicably reasonable, all components of the system are to be designed such that if any one of the components fails it will not result in loss of a load. The following should be considered: <ul style="list-style-type: none"> <li>○ It should be fitted with an independent auxiliary braking system to assist the primary braking system. Both systems should be designed to stop a full rated load at full speed and at least one of the independent braking systems should be mechanical and of a fail-safe design.</li> <li>○ It should be equipped with an automatic fail-safe system capable of stopping a full load</li> </ul> </li> </ul>

		<p>if a fault is detected in the primary or auxiliary brake system. An alarm should be provided at the driller's station when this system has activated.</p> <ul style="list-style-type: none"> <li>○ The mechanical coupling between the drawworks drum and auxiliary brake is to be provided with a system to prevent unintentional disengagement.</li> <li>○ The minimum number of wraps to remain on the drum when the travelling block is in the lowest position.</li> <li>○ It should be equipped with an emergency stop device which in the event of any single component failure shall have the capability to stop the movement.</li> <li>○ It should be provided with a safety device to prevent the travelling block from striking the crown of the derrick and the rig floor/rotary table.</li> <li>○ The auxiliary brake should be equipped to monitor level, flow and temperature of the cooling or operating fluid in a manner which assures serviceability of the auxiliary brake. Limit alarms should be provided when minimum limits for operations have been reached.</li> <li>○ The cooling water system, if equipped, should have a water treatment system in place or mechanism to monitor water quality to prevent lines from blocking</li> </ul>
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		and provide for adequate heat transfer.
Wire Rope (drill line, guideline tensioner lines, riser tensioner lines, lifting, etc.)	API Spec 9A (ISO 10425) and API RP 9B (contains recommended design features)	Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.
Crown Block	<ul style="list-style-type: none"> <li>• API Spec 4F, API Spec 8C (ISO 13535) and API RP 9B</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.
Top Drive  Swivels and Subs	<ul style="list-style-type: none"> <li>• API Spec 8C (ISO 13535)</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.
Travelling Blocks with Guide Track and Dolly  Adapters, Hooks and Links  Elevators  Deadline Anchor	<ul style="list-style-type: none"> <li>• API Spec 8C (ISO 13535) and API RP 9B</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.

Drill String Motion Compensators	<ul style="list-style-type: none"> <li>• API Spec 8C (ISO 13535) and API RP 9B</li> <li>• DNV-OS-E101</li> <li>• ABS Lifting Appliances Guide</li> <li>• ABS Guide for the Classification of Drilling Systems</li> </ul>	Operating, physical and environmental loads (temperature, ice, wind, sea states) to be taken into consideration.
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**Non - Conventional Hoisting Systems**

Hydraulic cylinder based hoisting system (ramrig/cylinder hoisting rig)	DNV-OS-E101	
Rack and Pinion Hoisting System	DNV-OS-E101	

NOTES:

- If any component in a non-conventional hoisting system is a component in a conventional hoisting system, then refer to the code/standard/rules under conventional hoisting systems for that component.
- All components should be designed or have additional equipment installed to prevent dropped objects.
- Any structural, electrical, pressure, internal combustion engines or other support systems to be designed, installed and certified in accordance with relevant regulations, codes, standards or other guidance.
- If mechanical or electrical equipment are required to operate in a hazardous environment it should be appropriately designed to do so without being a source of ignition.
- In all cases, physical and environmental loads (temperature, ice, wind, sea states) should be taken into consideration and appropriate limitations applied, e.g., minimum design temperature is typically minus 20°C for Grand Banks region.

### **3.3 Maintenance, Inspection and Testing Guidance**

Drilling hoisting equipment shall be maintained, inspected, and tested regularly in accordance with the rules, codes or standards to which they were designed, constructed, tested, and certified. The inspection, maintenance and testing program for any Marine Installation or Structure involved in well operations should be approved by the Certifying Authority.

**Table 3-2 Additional Maintenance, Inspection and Testing for Drilling Hoisting Equipment**

Description	Additional Maintenance, Inspection and Testing
Wire Rope (drill line, guideline tensioner lines, riser tensioner lines, lifting, etc)	<ul style="list-style-type: none"> <li>• API RP 9B</li> <li>• Tonne Mile Calculations should take into consideration the physical and environmental loading conditions at the drilling site, as applicable, to its application. Replacement or slip/cut programs should also be adjusted following non-standard operations or events. Premature failures have occurred, as the number and range of cycles were underestimated.</li> </ul>
Crown Block	API RP 4G, API RP 7L, API RP 8B (or ISO 13534) and API RP 9B
Top Drive	API RP 8B (or ISO 13534) and API RP 7L
Travelling Blocks with Guide Track and Dolly  Deadline Anchor  Drill String Motion Compensators	API RP 8B (or ISO 13534) and API RP 9B
Adapters, Hooks and Links  Elevators  Swivels and Subs	API RP 8B (or ISO 13534)
Hydraulic cylinder based hoisting system (ramrig/cylinder hoisting rig) Rack and pinion Hoisting System	DNV-OS-E101
<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Any installed electrical, pressure, internal combustion engines or other support systems to be operated, inspected, maintained and tested in accordance with relevant codes, standards and regulations.</li> <li>• Consider including appropriate sections of IADC Drilling Manual in conjunction with the above code/standard/rule.</li> <li>• In all cases, the inspection, testing and maintenance program in place should take into consideration the manufacturer’s recommendations and any recommendations identified as a risk mitigation measure.</li> </ul>	



### **3.2.1. Pre-Use Check**

When in use, equipment shall be visually inspected on a daily basis by a Competent Person for cracks, leaks, loose connections and other signs of damage, wear, corrosion, or overloading. Any deficiencies affecting safe operation should be corrected prior to use. The daily inspection by the Competent Person should also include visual inspection for potential dropped objects and retention devices or features that can be damaged, in need of adjustment, or missing. Any potential dropped objects or damaged/missing retention devices should be immediately corrected. The driller should complete and document that the appropriate inspections were conducted and can be documented in the drilling log or other suitable tools.

If it is suspected that the drilling hoisting equipment might have been damaged as a result of an incident, was overloaded, operated incorrectly or subject to other physical or environmental conditions that may have affected its safe operation, the use of the drilling hoisting equipment should be suspended from operation until inspected and tested for use by a Competent Person.

### **3.2.2. Inspection, Testing and Maintenance Documentation**

The inspection testing and maintenance report should include:

- The date of inspection, maintenance or test performed.
- Identification of the drilling hoisting equipment that was inspected or tested.
- Any safety observations including statement of whether the drilling hoisting equipment is acceptable for use.
- Repairs, if any, that were performed and who performed them.
- The name and signature of the Competent Person.
- For a report issued by a Third-Party Inspector, the qualifications of the Third-Party Inspector and the code, standard or rule to which the inspection is performed.

## **4.0 Offshore Containers and Portable Offshore Units 4.1.1 General Guidance**

For greater clarity, Containers and Portable Offshore Units are considered “materials handling equipment” in the OHS Regulations. Offshore containers and Portable Offshore Units should be designed, manufactured, tested, certified and

marked in accordance with an acceptable standard. The latest version of the following standards have been accepted:

- DNV-ST-E271 – 2.7-1 Offshore Containers (E271);
- ISO 10855 Offshore Containers and Associated Lift sets – Part 1, 2, and 3; or
- DNV-ST-E273 – 2.7-3 Portable Offshore Units (E273).

Containers certified to section 10 of E271. Appendix J - Offshore Containers for Use in Temperate Climates should not be accepted for general use in the Atlantic Canada Offshore Petroleum Area. Use of these Containers would be considered a unique lift as per Part 4.5.

Any major modifications or repairs to the load-carrying structural members of Containers and Portable Offshore Units are to be approved by the Container Certifying Authority. Certifying Authority Surveyors assigned to certify Containers and Portable Offshore Units should meet the test for the Competent Person.

Any Container considered to be used as part of a drilling or production program must be designed to meet any other regulations, standard or code in relation to its use. Refer to DNV-ST-E272 – 2.7-2 Offshore Service Modules, which provides guidance.

If a Container or Portable Offshore Unit is to be used onboard a Marine Installation or Structure that is not required to have a Certificate of Fitness and does not meet the acceptable standards it should not be lifted while it is conducting authorized activity in the Atlantic Canada Offshore Petroleum Area. If it is placed onboard a floating Marine Installation or Structure, it should be safely secured (e.g., sea-fastened) in a manner suitable to a marine warranty surveyor or a classification society for the duration of the authorized activity.

Environmental factors, including but not limited to design temperature, corrosive environment, and dynamic forces should be taken into account. The design temperature of the Container or Portable Offshore Unit should be stamped on the manufacturing data plate.

The owner or user of the Container or Portable Offshore Unit should keep design, manufacturing and certification records for as long as they own the Container.

All repairs and modifications to the Container or Portable Offshore Unit are to be performed in accordance with the rules or standard to which it was designed, constructed, tested, and certified.

The lift sets for Containers should be designed, selected, manufactured, tested, and marked as per the latest edition of E271 or ISO 10855-2. The certification documents issued by the Supplier of the lift set should be to the extent indicated in E271 or ISO 10855-2 and all other codes and standards listed within. The safety factor for the lift set and its components should be as specified by E271 or ISO 10855-2, or by the manufacturer, or by the Operator/owner, whichever factor of safety is greater. Refer to E273 for Portable Offshore Units.

Chain slings and the associated connectors are not recommended for use in the physical and environmental conditions that are experienced in the offshore area. However, if Containers or Portable Offshore Unit are equipped with chain slings, particular attention must be paid to the condition of the connecting links as they may fail in a condition that is undetectable.

The lift sets are considered to be part of the Container or Portable Offshore Unit and cannot be removed, repaired or modified without the agreement of the Certifying Authority or third party who has issued the certification for the Container.

Where practicable, Containers should have forklift pockets. When fitted the pocket should be designed and constructed in accordance with the relevant standard to which the Container is designed.

Where practicable, the lift set should be of sufficient length to allow easy handling by riggers. The top link or master link should be able to reach down to a maximum height above the contained bottom when the lift set hangs over the long side of the Container as specified in section 8.3 of E271.3

Other rules and standards referring to non-lifting parts of the unit may be applicable, for example CSA B51 Boiler, Pressure Vessel, and Pressure Piping Code, ASME Boiler and Pressure Vessel Code, TDG, IMO IMDG Code, E272, or NEC.

## 4.2 Certification

The certification and documentation for a Container or Portable Offshore Unit are as follows:

- Certificate issued by a Certifying Authority in accordance with the Standard used and one of the following:
  - Certificate in accordance with E271
  - Certificate in accordance with E273 or
  - ISO 10855 – Certificate of Conformity.

- The “Offshore Container Certificate” or “Certificate of Conformity” should include the particulars of the Container or Portable Offshore Unit (description or name, ID number, serial number, dimensions, etc.), design temperature, design code, and any other limitations or remarks. Any significant repairs or alterations are cause to reissue or amend the certificate.
- The Container or Portable Offshore Unit certificate is only valid when the equipment is fitted with a certified lift set. The lift set certificate may be issued by the Certifying Authority or by an approved service Supplier under the Type Approval of Lift sets within the Standard.

### 4.3 Inspection and Testing

Containers should be inspected regularly in accordance with the rules or standard to which they were designed, constructed, tested, and certified. Containers are subject to annual (12 month) and periodic (48 month) inspection and testing in accordance with the E271 standard and ISO 10855-3 standard. Portable Offshore Units should be inspected regularly in accordance with E273.

If findings are reported that are outside acceptance criteria in the Standard, the Certifying Authority that issued the Certificate should carry out a damage survey. Prior to repairs the company carrying out the repair and the Certifying Authority will agree to the changes. If substantial repairs or alternations are carried out, a lifting test is to be witnessed by the Certifying Authority. Non-destructive testing reports are to be reviewed by the Certifying Authority for the Container or Portable Offshore Unit.

The visual examinations of Containers or Portable Offshore Unit should include confirmation that the installed lift set matches the lift set stated on the certificate. However, the lift set can be inspected separately from the Container or Portable Offshore Unit and such inspection should be indicated by the marking on the tag.

Non-lifting parts of the Container or Portable Offshore Unit may be subjected to inspection as per other relevant rules, codes or standards.

If the inspection is carried out by an inspector other than the Certifying Authority, that inspector must be authorized by the Certifying Authority to carry out that work under the direction of Annex B and C of the ISO 10855-3 standard. This is accomplished by the Certifying Authority auditing the Competent Third-Party inspection company annually and finding it competent to carry out the inspection on behalf of the Certifying Authority. In addition, the Third-Party inspection company should have an acceptable quality assurance system compliant and certified to ISO 9001 or equivalent.

#### **4.4 Inspection and Testing Documentation**

A report documenting the testing and thorough examination of the Container or Portable Offshore Unit is to be issued by the inspector either from the Certifying Authority or a competent Third-Party Inspector. This report will be issued after the actual examination or test has been completed in its entirety and the inspection plate on the Container or Portable Offshore Unit appropriately hard stamped (marked) and dated.

The report should include confirmation that inspections as per the relevant rule or standard, E271, E273 or ISO 10855 were carried out. The information required in the report are outlined in Section 11 of ISO 10855-3 standard.

#### **4.5 Unique Container or Portable Offshore Unit Lifts**

For one-off lifts of uncertified units, a review should be performed before the operation proceeds to identify hazards and appropriate mitigations. The review may be a risk assessment or other formal process carried out in accordance with procedures approved by the Operator and agreed by the Certifying Authority of the offshore installation to which the Container or Portable Offshore Unit is to be transported. A competent third-party company, on behalf of the offshore installation Operator, may carry out the review.

#### **4.6 Existing Containers or Portable Offshore Units**

To remain in service, an existing Container or Portable Offshore Unit should comply, as a minimum, with the following:

- Have design and manufacturing records indicating that the Container/Portable Offshore Unit is fit for purpose in the Atlantic Canada Offshore Petroleum Area.
- The existing records should be subjected to an engineering appraisal and result in the issuance of a certificate as per Part 4.2. The Certifying Authority, any third party (other than the owner/user) manufacturer, or inspection and testing or engineering company who meet the intent of 4.2, can carry out the appraisal of the existing records and issuance of the certificate.
- In the event that the material of the primary structure of the Container or Portable Offshore Unit does not satisfy the demands of a cold-temperature environment, but is otherwise structurally acceptable, such limitations shall be made obvious on the

documentation and on the unit itself. The markings on the units should leave no doubt as to the limitations of the Container or Portable Offshore Unit. Use of such units will be restricted accordingly. The restrictions shall be specified as a result of an appraisal as described in 4.6 and be clearly written on the certificate.

- Ongoing inspection, testing and certification as specified in Parts 4.3 and 4.4.

## **5.0 Loose Lifting Gear**

### **5.1 General Guidance**

#### **5.1.1 Codes, Standards, Rules and Specifications**

For greater clarity, loose lifting gear is considered “materials handling equipment” in the OHS Regulations. Table 5-1 lists acceptable optional codes, standards, rules, and specifications for loose lifting gear as well as additional documentation. Other codes, standards, rules, and specifications may be used if deemed appropriate by the Operator's Competent Person.

#### **5.1.2 Certification and Documentation**

The general guidance for certification and documentation for loose lifting gear are provided below and additional key considerations specific to different types of loose lifting gear are included in Table 5-1.

##### **5.1.2.1 Markings**

The following information should be marked on the equipment:

- SWL or working load limit.
- Manufacturer's logo or mark.
- Serial number or manufacturer's traceability number.

#### **NOTES:**

- The manufacturer’s SWL on loose lifting gear may not take into account environmental conditions in the operating area where the equipment is to be used (including waves, current, extremes of temperature, wind load, load sail area, etc.). Equipment should be downgraded appropriately, or the purchaser should take into consideration the operating environment before the equipment is purchased. Any limitations respecting use should be marked on the equipment.

- Handlers or users of loose lifting gear must be careful when adding their own markings to equipment provided by a rigging manufacturer, as additional markings may cause confusion or affect the integrity or safety of the equipment.

### **5.1.2.2 Documentation**

The certificate and documentation for the equipment, if applicable, should include:

- Description of the material and heat treatment if applicable for all parts of the equipment.
- Code, standard or industrial practice to which the design, fabrication and testing of the equipment supplied complies.
- Manufacturers design specifications and drawings.
- Date of manufacture.
- Proof load test applied (as per manufacturer's recommendation).
- Testing information including name of person declaring test has been performed, date and place of test, model, serial number, and last date of calibration of testing machine, and code, standard or industrial practice to which the testing equipment complies.
- Statement of conformity.
- Design and manufacturing traceability information as applicable:
  - destruct test results of batch or prototype indicating actual and nominal breaking load,
  - batch production number,
  - material certificate as per EN10204 type 3.1 for load bearing components and
  - temperature rating.

**Table 5-1 Recognized Standards and key considerations for Loose Lifting Gear**

Description	Code/Standard/Rules	Additional
Beams—lifting beams, spreader beams, lifting frames	<ul style="list-style-type: none"> <li>• ASME B30.20 (Referenced in OHS Regulations)</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> <li>• DNV-ST-0378</li> <li>• ABS Guide for the Certification of Lifting Appliances</li> </ul>	<p>Key considerations:</p> <ul style="list-style-type: none"> <li>• Design Report and drawings</li> <li>• Stamped drawing</li> <li>• Manufacturer Record Book</li> <li>• Material certs</li> <li>• Load test</li> </ul> <p>SWL ≥ 10 Tonne: Manufacturer’s Certificate of Compliance with material certificates for load bearing materials in accordance with EN 10204, type 3.2. For Independent Certificate of Compliance to be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p> <p>SWL &lt; 10 Tonne: Manufacturer’s Certificate of Compliance with material certificates for load bearing materials in accordance with EN 10204, type 3.1.</p>
Clamps—beam and plate lifting	<ul style="list-style-type: none"> <li>• ASME B30.20 (clamps below hooks) (Referenced in OHS Regulations)</li> <li>• ASME B30.16 (beam clamps)</li> <li>• DNV-ST-0378</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> </ul>	Clamps shall not be used for personnel lifting unless they have been approved by the manufacturer or a competent person for that purpose.
Detachable	ASME B30.26 (Referenced in	



Load-Indicating Devices	OHS Regulations)	
Drum Lifters	ASME B30.20 (Referenced in OHS Regulations)	
Eye bolts and Swivel Hoist Rings	<ul style="list-style-type: none"> <li>• ASME B30.26 (eyebolts, eye nuts and swivel hoist rings) - (Referenced in OHS Regulations)</li> <li>• DIN 582 (eye nuts)</li> <li>• DNV-ST-0378</li> <li>• ISO 3266 (eyebolts)</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> </ul> <p>Socket-Head Cap Screws</p> <ul style="list-style-type: none"> <li>• ASTM A574 and UNC-3A</li> <li>• ISO 4762</li> </ul>	
Hoists - manual chain, lever chain, manual trolleys, beam trolleys	<ul style="list-style-type: none"> <li>• CSA B167 (Note: ASME B30.21 (lever hoists, as applicable) (Referenced in the OHS Regulations)</li> <li>• EN 13157</li> </ul>	Inspection Certificate as per EN 10204, type 3.1 for load bearing parts including load chain.
Hooks—below the crane hook	<p>ASME B30.10 (Referenced in OHS Regulations)</p> <p>DNV-ST-0378</p> <p>EN 1677 series</p> <p>LR Code for Lifting Appliances in a Marine Environment</p> <p>ABS Guide for the Certification of Lifting Appliances</p>	<p>Charpy Impact Test results at a temperature suitable for local environmental conditions.</p> <p>SWL ≥ 10 Tonne: Independent Certificate of Compliance. To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p> <p>SWL &lt; 10 Tonne: Manufacturer’s Certificate of compliance with material certificates for load bearing materials in accordance with EN 10204, type 3.1.</p>

Jacks and Rams	ASME B30.1 EN 1494	
Slings—chain	<ul style="list-style-type: none"> <li>• ASME B30.9 (Referenced in OHS Regulations)</li> <li>• EN 818-1</li> <li>• EN 818-4 (Grade 8)</li> <li>• EN 818-5 (Grade 4)</li> <li>• DNV-ST-0378</li> <li>• ISO 3056</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> </ul>	<p>Manufacturer’s Certificate of compliance with material certificates for load bearing materials in accordance with EN 10204, type 3.1.</p> <p>Composite load test (where sling components are load tested separately) is acceptable for mechanically assembled chain slings.</p>
Slings—flat woven webbing	<ul style="list-style-type: none"> <li>ASME B30.9 (Referenced in OHS Regulations)</li> <li>• EN 1492-1</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> <li>• Standards compiled by the Web Sling &amp; Tie Down Association (WSTDA)</li> <li>•</li> </ul>	
Slings—round man-made fiber	<ul style="list-style-type: none"> <li>• ASME B30.9(Referenced in OHS Regulations)</li> <li>• EN 1492-2</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> <li>• Standards compiled by the Web Sling &amp; Tie Down Association (WSTDA)</li> </ul>	
Slings—wire	ASME B30.9 (Referenced in	All termination fittings to be quenched and

<p>rope (includes ferrules/sockets)</p>	<p>OHS Regulations) EN 13414 DNV-ST-0378 ISO 7531 Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment Note: Refer to Safe Lifting Practice Part 4 for details for lift sets on Containers and Portable Offshore Units.</p>	<p>tempered material.  The form of splice, known as a “liverpool splice” should not be used.</p>
<p>Sling termination and rigging hardware, i.e. shackles, ferrules, shackle pins links</p>	<ul style="list-style-type: none"> <li>• ASME B30.26 (Referenced in OHS Regulations)</li> <li>• EN 1677 series</li> <li>• EN 13411 series</li> <li>• EN 13889 (shackles)</li> <li>• DNV-ST-0378 (loose gear)</li> <li>• Federal Specification (US) RR-C- 271</li> <li>• ISO 2415 (shackles)</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> </ul>	<p>Charpy Impact Test results at a temperature suitable to the local environmental conditions.</p> <p><b>NOTE:</b> only shackles fitted with locking nuts and pins (four part or bolt type) should be used where possible.</p> <p>CNSOPB Notice-Safety Alert Nov 30, 2018, Safety Notice – Bolt Type Shackle Inspection. <a href="https://www.cnsopb.ns.ca/publications/notice-safety-alert-bolt-type-shackle-inspection">https://www.cnsopb.ns.ca/publications/notice-safety-alert-bolt-type-shackle-inspection</a></p> <p>Master links, quad master links, chain, connecting links and shackles to be supplied with a Certificate of compliance with material certificates for load bearing materials in accordance with EN 10204, type 3.1, including but not limited to, Charpy Impact Testing results at a temperature suitable to the local environmental conditions.</p> <p>Master link sub-assembly and shackles to be individually serialized and load proof tested.</p>
<p>Sockets—wedge and Wire Rope Clips</p>	<ul style="list-style-type: none"> <li>• ASME B30.26 (Referenced in OHS Regulations)</li> <li>• EN 13411</li> </ul>	
<p>Rigging Blocks</p>	<ul style="list-style-type: none"> <li>• ASME B30.26 (Referenced in OHS</li> </ul>	

	Regulations) <ul style="list-style-type: none"> <li>• DNV-ST-0378</li> </ul>	
Rigging screws and Turnbuckles	<ul style="list-style-type: none"> <li>• ASTM F1145</li> <li>• ASME B30.26 (Referenced in OHS Regulations)</li> <li>• BS 4429</li> <li>• DNV-ST-0378</li> <li>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment</li> </ul>	Turnbuckle use should be restricted to static load applications.

**Notes:**

- Design temperature of the loose lifting gear to be considered by the Competent Person when selecting lifting equipment for use on the Marine Installation or Structure, e.g., minimum design temperature is typically minus 20°C for Grand Banks region. Consult with completed Environmental Assessment for region of operation.
- Work scope for certification of loose lifting gear by the Certifying Authority on a Marine Installation or Structure requiring a Certification of Fitness may involve design appraisal and survey during fabrication.

## 5.2 Inspection and Testing

Loose lifting gear should be inspected regularly by Third Party Inspectors in accordance with the rules or standard to which it was designed, constructed, tested, and certified. Inspection and testing frequency should take place at intervals not exceeding those listed in Table 5-2.

**Table 5-2 Inspection and Testing Guidance for Loose Lifting Gear**

Description	Visual	NDE	Operational and/or Load Test(s)
Beams—lifting beams, spreader beams, lifting frames  (Refer to ASME B30.20) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.20	Before and after load test	As per ASME B30.20
Clamps—beam and plate lifting  (Refer to ASME B30.20 (clamps below hooks); CSA B167 and ASME B30.16 (beam clamps)) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.20 or B30.16	N/A	As per ASME B30.16 and B30.20
Detachable Load-Indicating Devices  (Refer to ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.26		
Drum Lifters (Refer to ASME B30.20) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.20	N/A	As per ASME B30.20
Eye bolts and Swivel Hoist Rings  (Refer to ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.26	N/A	N/A
Hoists—manual chain, lever	6 Month or more	N/A	As per CSA B167 and

<b>Description</b>	<b>Visual</b>	<b>NDE</b>	<b>Operational and/or Load Test(s)</b>
chain, manual trolleys, beam trolleys  (Refer to CSA B167 and ASME B30.21, as applicable) (Referenced in the OHS Regulations)	frequently as required by CSA B167 and ASME B30.21, as applicable)		ASME B30.17, B30.16, B30.21, as applicable
Hooks—below the crane hook  (Refer to ASME B30.10) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.10	As required by ASME B30.10	As required by ASME B30.10
Jacks and Rams  (Refer to ASME B30.1)	6 Month or more frequently as required by ASME B30.1	N/A	N/A
Slings—chain  (Refer to ASME B30.9) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.9	N/A	As per ASME B30.9
Slings—flat woven webbing  (Refer to ASME B30.9) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.9	N/A	As per ASME B30.9 and representative sample(s) tested in accordance Transport Canada TP 12245E Web Sling Standard.
Slings—round man-made fiber  (Refer to ASME B30.9) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.9	N/A	As per ASME B30.9 and representative sample(s) tested in accordance Transport Canada TP 12245E Web Sling Standard.
Slings—wire rope (includes ferrules/sockets)	6 Month or more frequently as required by	N/A	As per ASME B30.9

Description	Visual	NDE	Operational and/or Load Test(s)
(Refer to ASME B30.9) (Referenced in the OHS Regulations)	ASME B30.9		Note: For lift, sets on Containers and Portable Offshore Units refer to Safe Lifting Practice Section 4.
Sling termination and rigging hardware, i.e. shackles, ferrules, shackle pins links  (Refer to ASME B30.9 and ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.9 or ASME B30.26	N/A	N/A
Sockets—wedge and Wire Rope Clips  (Refer to ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.26	N/A	N/A
Rigging Blocks  (Refer to ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.26	N/A	N/A
Rigging Screws and Turnbuckles  (Refer to ASME B30.26) (Referenced in the OHS Regulations)	6 Month or more frequently as required by ASME B30.26	N/A	N/A
<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• A load test, NDE or other suitable inspection and testing may be specified by the assigned Third Party Inspector based on the results of the visual inspection.</li> <li>• Operations and maintenance requirements of the codes referenced above as well as manufacturer’s recommendations should be taken into consideration. e.g. ASME Codes require that items in “severe service” have more frequent periodic inspections.</li> </ul>			

### 5.3 Pre-Use Check

The handler or user of the loose lifting gear shall carry out a pre-use check to ensure that the loose lifting gear complies with the current colour code, has appropriate certification and an SWL-rating suitable for the load to be lifted. In addition, the pre-use check ensures no visible damage or defects are present. An inspection report is not required.

Broken or defective loose lifting gear, loose lifting gear that is missing its colour code or markings or missing its certification, should be immediately removed from service and quarantined and marked for Third-Party Inspectors to inspect, repair or discard, if required.

Loose lifting gear should also be removed from operation if it is suspected that the loose lifting gear might have been damaged as a result of an incident, was overloaded, operated incorrectly or subject to other physical or environmental conditions that may have affected its safe operation.

### 5.4 Inspection and Testing Documentation

The inspection report should include:

- The date of inspection or test performed.
- Identification of the loose lifting gear that was inspected or tested.
- Identify any safety observations, including statement of whether the loose lifting gear is acceptable for use.
- What repairs, if any, were performed and who performed them including:
  - the code, standard or rule to which the inspection was performed.
  - the name and qualifications of the Third-Party Inspector.
  - the signature of the Third-Party Inspector.

### 5.5 Colour Coding

All loose lifting gear and other lifting devices referred to in Section 6.0 should be colour coded after being inspected or certified by a Third-Party Inspector. The colour indicates to the handler or user that a thorough examination has been performed within the prescribed period. For example, the colour coding in Table 5-3 could be applied to loose lifting gear.



**Table 5-3 Colour Coding**

Year	Time Period	Colour
Even Years	Jan 01 - Jun 30	Yellow
	July 01 - Dec 31	Green
Odd Years	Jan 01 - Jun 30	Pink
	July 01- Dec 31	Blue
Broken, damaged or defective materials handling equipment		Red

**Notes:**

- Colour code applies to the date the inspection is carried out and is valid for six months. Example: A third-party lifting inspection in April 2019 will use Pink and will require the next inspection to occur in October 2019 where the Colour Code will be Blue.
- Implementation period of one month permitted.
- Colour codes to be posted in the workplace with the valid code identified.
- All traces of paint from former colour coding should be removed or completely painted over.
- Permanent oil or epoxy enamel spray or brushed paint should be used where practicable. Over-spray is to be avoided. Coloured status tags may be used. It should be noted that the brushed paint tends to be clearer, lasts longer and is neater for surrounding equipment. If the colour code fades, then the equipment should be quarantined and repainted as required.
- Some installations use Containers to store and manage all loose lifting gear. This Container is normally changed out every six months and reduces the time spent offshore by Third-Party Inspectors.

**6.0 Other Lifting Devices**

**6.1 General Guidance**

**6.1.1 Codes, Standards, Rules and Specifications**

For greater clarity, other lifting devices are considered “materials handling equipment” in the OHS Regulations and where specified,

the guidance respecting “cranes”, “hoists” and “personnel transfer device”, also apply to the particular type of equipment being referenced. Table 6-1 lists acceptable optional codes, standards, rules, and specifications for lifting devices as well as additional guidance and documentation. Other codes, standards, rules, and specifications may be used if deemed appropriate by the Operator's Competent Person.

## **6.1.2 Certification and Documentation**

The general guidance for certification and documentation for lifting devices are provided below and additional guidance specific to different types of lifting devices are included in Table 6-1.

### **6.1.2.1 Markings**

The following information is to be marked on the equipment:

- SWL or working load limit.
- Unique identification mark such as a serial number or manufacturer's traceability number.
- Devices intended for personnel lifts to be marked “For Personnel Lifting Only.”

### **6.1.2.1 Documentation**

The certificate and documentation accompanying the equipment should include, as applicable:

- Description of the material and heat treatment if applicable for all parts of the equipment.
- Code, standard or industrial practice to which the design, fabrication and testing of the equipment supplied complies.
- Date of manufacture.
- Proof load test applied (as per manufacturer's recommendation).
- Testing information including name of person declaring the test has been performed; date and place of test; model, serial number and last date of calibration of testing machine; and code, standard or industrial practice to which the testing equipment complies.
- Statement of conformity.
- Design and manufacturing traceability information:
  - destruct test results of prototype indicating actual and nominal breaking load,
  - serial number or batch production number as appropriate,
  - material certificates as per EN10204, type 3.1, and
  - temperature rating.

**Table 6-1 Guidance for Lifting Devices**

Description	Reference Code / Standard/Rules	Additional Guidance and Documentation
Conveyors	ASME B20.1 (Referenced in the OHS Regulations)	
Cranes—Mobile (lattice and telescopic boom cranes)	<ul style="list-style-type: none"> <li>• CSA Z150</li> <li>• ASME B30.5</li> <li>• EN 13000</li> </ul>	Certified by the Certifying Authority for use onboard a Marine Installation or Structure requiring a Certificate of Fitness. Mobile Cranes should not be used onboard a floating Marine Installation or Structure without conducting a risk assessment to identify additional measures to be implemented (e.g. measures to prevent overturning or movement, limits for operation in relation to physical environmental conditions, operations in a potentially hazardous environment, etc.).
Crane—Overhead and Gantry	<ul style="list-style-type: none"> <li>• BS 2853</li> <li>• CSA B167 and ASME B30.2 (Referenced in the OHS Regulations)</li> <li>• EN 15011</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> <li>• DNV-ST-0377</li> <li>• DNV-ST-0378</li> <li>• DNV-OS-E101</li> <li>• ABS Guide for Certification of Lifting Appliances</li> </ul>	<p>SWL ≥ 10 Tonne: Independent Certificate of Compliance</p> <p>SWL ≥ 10 Tonne: To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p>
Cranes – Provision and Jib, A-Frames, Outriggers	<ul style="list-style-type: none"> <li>• CSA B167 (Referenced in the OHS Regulations)</li> <li>• ABS Guide for Certification of Lifting Appliances</li> </ul>	<p>SWL ≥ 10 Tonne: Independent Certificate of Compliance</p> <p>SWL ≥ 10 Tonne: To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p>

	<ul style="list-style-type: none"> <li>• DNV-ST-0377</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> </ul>	
Monorails	<ul style="list-style-type: none"> <li>• BS 2853</li> <li>• CSA B167 and ASME B30.17 (Referenced in the OHS Regulations)</li> </ul>	
Forklifts	<ul style="list-style-type: none"> <li>• CSA B335 (Referenced in the OHS Regulations)</li> </ul>	<p>Certified by the Certifying Authority for use onboard a Marine Installation or Structure with a Certificate of Fitness.</p> <p>Refer also to the requirements for “mobile equipment” and “forklifts” in the OHS Regulations.</p>
Dedicated Personnel Work Baskets including lift sets	<ul style="list-style-type: none"> <li>• EN 14502</li> <li>• DNV-ST-0377</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> <li>• ABS Guide for Certification of Lifting Appliances</li> </ul>	<p>Certification issued by Certifying Authority stating, "Suitable for Personnel Lifting (or Manriding)."</p> <p>Label to be affixed stating “Personnel Lifting Only.”</p> <p>Load hooks in load path connecting the basket to the hoisting mechanism should be capable of being locked and pinned to ensure the connecting shackle will not dislodge from the hook.</p> <p>Secondary means of fall arrest should be provided.</p>
Pad Eyes Fixed to Permanent Structures	<p>ISO 19900 Petroleum and Natural Gas Industries - general requirements for offshore structures</p> <p>For design check:</p> <ul style="list-style-type: none"> <li>• CSA S16; or</li> </ul>	<p>SWL ≥ 10 Tonne: Independent Certificate of Compliance. To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p> <p>SWL &lt; 10 Tonne: Material Certificate in accordance with EN 10204, type 3.1 for material. Welding, NDE and load test</p>

	<ul style="list-style-type: none"> <li>• API RP2A and AISC</li> </ul>	<p>documentation to be maintained by the Operator.</p> <p>Pad-eyes and anchorages used in personnel lifting operations should be designed with a factor of safety against braking of 10.</p> <p>Pad-eyes are to be marked with SWL. Register of pad-eyes to be maintained on an installation to aid in inspection and maintenance.</p>
<p>Personnel Transfer Devices (for marine transfers) (Referenced in the OHS Regulations)</p>	<ul style="list-style-type: none"> <li>• DNV-ST-0377</li> <li>• DNV-ST-0378</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> <li>• ABS Guide for Certification of Lifting Appliances</li> </ul>	<p>Independent Certificate of compliance in accordance with EN 10204, type 3.2. To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p> <p>The unit should have a design temperature suitable for the local environmental conditions.</p> <p>The manufacturer should supply:</p> <ul style="list-style-type: none"> <li>• Operating procedures and a training package for the device.</li> <li>• Maintenance and inspection procedures.</li> </ul> <p>At least two Personnel Transfer devices shall be provided on an installation engaged in production or well operations or is an accommodation installation with respect to those operations.</p>
<p>Hoists—cargo winches</p>	<ul style="list-style-type: none"> <li>• ASME B30.7</li> <li>• EN 14492-2</li> <li>• ABS Guide for Certification of Lifting Appliances</li> <li>• DNV-OS-E101</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> </ul>	<p>SWL ≥ 10 Tonne: Independent Certificate of Compliance</p> <p>SWL ≥ 10 Tonne: To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p> <p>To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</p>

<p>Hoists (stand-alone)—personnel lifting (also referred to as manriding winches)</p>	<ul style="list-style-type: none"> <li>• ABS Guide for Certification of Lifting Appliances</li> <li>• DNV-OS-E101</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> </ul>	<ul style="list-style-type: none"> <li>• Independent Certificate of compliance in accordance with EN 10204, type 3.2 To be certified by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness.</li> <li>• Manufacturer certificate of conformity stating hoist is suitable for personnel lifting.</li> <li>• Hoist to be certified by a CA for personnel lifting.</li> <li>• Plate to be affixed to the hoist body stating, “Approved for Personnel Lifting (or Manriding) Only.”</li> <li>• Shall have a secondary brake system independent of main drive.</li> <li>• Hoist system should have independent shut-off mechanism located between power source and hoist unit to ensure that all hoist motion can be stopped quickly.</li> <li>• Overload and over-hoist limit safety devices should be installed.</li> <li>• Overspeed limit safety device should be installed on electric powered hoists.</li> <li>• Drum guards and spooling devices should be fitted.</li> <li>• Means for emergency load lowering should be provided.</li> </ul>
<p>Wire rope (cranes, lifeboat falls, other materials handling equipment)</p>	<p>All:</p> <ul style="list-style-type: none"> <li>• API Spec 9A</li> <li>• API RP 9B</li> <li>• BS 463-1 &amp; 2</li> <li>• EN 12385</li> <li>• ISO 2408</li> <li>• ISO 10425</li> <li>• ISO 17558</li> <li>• DNV-ST-0378</li> <li>• LR Code for Lifting Appliances in a Marine Environment</li> <li>• ABS Guide for Certification of</li> </ul>	<p>Information to be marked on the item:</p> <ul style="list-style-type: none"> <li>• Manufacturer's name or logo.</li> <li>• SWL of the rope to be hard stamped on a metal tag.</li> <li>• Reel number from which rope has been cut.</li> </ul> <p>Other Documentation:</p> <ul style="list-style-type: none"> <li>• Certificate issued by a Certifying Authority.</li> <li>• Destruct test results indicating actual and nominal breaking loads.</li> </ul>

	<p>Lifting Appliances</p> <p>Cranes:</p> <ul style="list-style-type: none"> <li>• API Spec 2C</li> <li>• API RP 2D</li> <li>• ISO 4309</li> </ul> <p>Lifeboat Falls:</p> <ul style="list-style-type: none"> <li>• SOLAS and latest IMO circulars</li> <li>• Lifesaving Equipment Regulations (Transport Canada) for Construction Vessels and Installations</li> </ul>	
Lift Points on Equipment (including portable or temporary equipment)	<p><b>ISO 19900</b> Petroleum and natural gas industries — General requirements for offshore structures.</p> <p>For design check:</p> <ul style="list-style-type: none"> <li>• CSA S16; or</li> <li>• API RP2A and AISC.</li> </ul>	
<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Design temperature of the lifting device to be considered by the Competent Person when selecting lifting equipment for use on the Marine Installation or Structure (e.g. minimum design temperature is typically minus 20°C for Grand Banks region, consult with completed Environmental Assessment for region of operation).</li> <li>• Work scope for certification of lifting device by the Certifying Authority on an Installation may involve design appraisal and survey during fabrication.</li> </ul>		

## 6.2 Inspection and Testing

With the exception of personnel transfer devices and devices used in conjunction with personnel transfer devices (e.g. require inspection at least once every six months), the OHS Regulations requires that all “material handling equipment” be inspected at least annually and following certain events. Lifting devices should also be inspected regularly in accordance with the rules, code or standard to which they were designed, constructed, tested, and certified and

any inspection items contained in Table 6-2. For a Marine Installation or Structure requiring a Certificate of Fitness, the inspection and testing program for lifting devices should be approved by the Certifying Authority as required by the Certificate of Fitness Regulations.

**Table 6-2 Inspection and Testing for Lifting Devices**

Description	Additional Inspection and Testing
Conveyors	ASME B20.1 (Referenced in the OHS Regulations)
Cranes—Mobile (lattice and telescopic boom cranes)	Annually or more frequently based on the code or standard used for design, operation, inspection, testing and maintenance.
Crane—Overhead and Gantry	Annually or more frequently based on class of service or operating conditions as per CSA B167
Cranes – Provision and Jib, A-Frames, Outriggers	Annual or more frequently based on class of service or operating conditions as per CSA B167 (Referenced in the OHS Regulations)
Monorails	Annually or more frequently based on class of service or operating conditions as per CSA B167 and normative references (Referenced in the OHS Regulations)
Forklifts	As per CSA B335 and annually (Referenced in the OHS Regulations)
Dedicated Personnel Work Baskets including lift sets	Annually or more frequently based on the code or standard used for design, operation, inspection, testing and maintenance.
Pad Eyes Fixed to Permanent Structures	<p>For a Marine Installation or Structure requiring a Certificate of Fitness, pad-eyes should be load tested and receive a non-destructive examination and a certificate issued:</p> <ul style="list-style-type: none"> <li>• When pad-eye is installed or first taken into service, or</li> <li>• After a structural repair to correct a defect / damage (e.g. welding repair or replacement) and prior to use.</li> </ul> <p>For pad-eyes with SWL <math>\geq</math> 10 tonnes, the testing to be certified by</p>



	<p>the Certifying Authority.</p> <p>On all Marine Installations or Structures, pad-eyes should be:</p> <ul style="list-style-type: none"> <li>• Removed after use, or</li> <li>• Visually inspected and the result reported by a Competent Person annually, or</li> <li>• Visually inspected and reported by a Competent Person prior to use, unless an inspection report or certificate can be provided which indicates the pad-eye has been inspected and accepted within the last 12 months.</li> </ul> <p>Based on the result of the visual examination a competent inspector may specify NDE to verify the integrity of the device.</p>
Personnel Transfer Devices (for marine transfers) and devices used (e.g., slings, shackles, etc.)	6-month visual inspection by Third Party Inspector.
Hoists – cargo winches	Annually or more frequently based on the code or standard used for design, operation, inspection, testing and maintenance.
Hoists (stand-alone)—personnel lifting (also referred to as manriding winches)	Annually or more frequently based on the code or standard used for design, operation, inspection, testing and maintenance.
Wire rope – cranes and other materials handling equipment	Annually or more frequently based on the code or standard used for design, operation, inspection, testing and maintenance.
Wire rope — lifeboat falls	Lifeboat falls in accordance with the <i>Life Saving Equipment Regulations</i> for Installations and vessels used in Construction. All other marine installations and structures follow SOLAS and latest IMO circulars. To be visually inspected at least annually by a Third-Party Inspector.
Lift Points on	The lifting points and equipment should, where applicable, be

Equipment (including portable or temporary equipment)	visually inspected pre-use by the handler/user for damage or deterioration and at least annually by a Third-Party Inspector.

### 6.3 Pre-Use Check

The handler or user of the lifting device shall carry out a pre-use check to ensure the lifting device is safe for use. The pre-use check should ensure the lifting device has appropriate certification, periodic inspection records, and that the intended lift is no more than the SWL. In addition, the pre-use check ensures no visible damage or defects are present and the lifting device functions as intended. An inspection report is not required, unless it is an activity being conducted under a work permit.

Broken or defective lifting devices that are missing colour code or certification should be immediately removed from service by marking with red and a tag stating “DO NOT USE” until a Third-Party Inspector has inspected, repaired or replaced the device. The device should also be removed from service if it is suspected that the device might have been damaged as a result of an incident, was overloaded, operated incorrectly or subject to other physical or environmental conditions that may have affected its safe operation.

### 6.4 Inspection and Testing Documentation

The inspection report should include:

- The date of inspection or test performed.
- Identification of the lifting device that was inspected or tested.
- Any safety observations including statement of whether the lifting device is acceptable for use.
- Repairs, if any, that were performed and who performed them.
- The code, standard or rule to which the inspection is performed.
- The name and qualifications of the Third-Party Inspector.
- Signature of the Third-Party Inspector.

**Where feasible, in accordance with Part 5.5, all lifting devices should be colour coded after they are inspected or certified by a Third-Party Inspector.**

## 7.0 Operational Best Practices

### 7.1 Operational Best Practices

#### 7.1.1 Management System and OHS Program

In accordance with the *Accord Act(s)* and regulations, Operators and employers shall have a management system in place that specifies company expectations and requirements with respect to the key factors that impact on safe lifting operations, including but not limited to:

- Identification of duties, responsibility, and accountability.
- Organization, planning and performance of lifting operations.
- Maintenance including repairs and inspection of lifting equipment.
- Management of all employers, providers of service and suppliers.
- Training and competency assessment.

In addition, every employer shall develop, implement and maintain an OHS Program. The contents of the program include but are not limited to:

- Risk management.
- Training supervision.
- Procedures to be followed.

Requirements for management systems and OHS programs are outlined in the *Accord Act(s)* and regulations. In addition, training and competency for specific roles on production and drilling installations are located in the Atlantic Canada Offshore Petroleum Standard Practice for the Training and Qualifications of Offshore Personnel.

In accordance with the *Accord Act(s)* and regulations, Operators and employers are required to conduct risk assessment(s) prior to and during operations for any other relevant health, safety or environmental hazards that are not dealt with by the standards that will reduce the risk to as low as reasonably practicable. The management system is required to take this into consideration. In addition, the rules of flag state, classification society or other authorities should be considered and applied.

### 7.1.2 Lifting Equipment Register

A register of materials handling equipment should be kept current at the relevant Marine Installation or Structure and for Containers, the shore base. Equipment listed in the register should include, but not be limited to:

- Crane running and standing wire
- Bridles
- Load hooks
- Pennants
- Shackles
- Multi-purpose slings, casing slings, sling sets, master links, sub link sets
- Spreader beams or similar lifting devices
- Monorails, trolleys and chain lifts
- Pad eyes
- Personnel Transfer devices
- BOP handling systems
- Drilling hoisting equipment, including hoists used for personnel lifting (e.g., manriding hoists), tuggers, and tong counter weights
- Emergency lifting devices such as confined space tripods.

The register should contain the following information for each piece of materials handling equipment:

- Location
- Description
- Date when first placed into service
- Unique identification number
- Certificate number
- Date last inspected and tested
- Degradation notes
- SWL and
- Any operational or environmental limitations with respect to use of that equipment
- Any equipment used for lifting of personnel must be certified to do so by the manufacturer and should only be used for that purpose. In addition, the code applied for the inspection of this equipment must be appropriate to lifting personnel and the inspection company must be competent to perform that inspection.

### 7.1.3 Safe Lift Zones

A diagram should be available that identifies the following:

- Location of cargo handling cranes and capacities.
- Location, area, and capacity of landing areas.
- Blind lift areas.
- Obstructions to crane operations.
- Restricted swing or lifting areas, including subsea exclusion zones.

## **7.1.4 Communications**

### **7.1.4.1 General**

All personnel involved in lifting operations on a Marine Installation or Structure, offshore supply vessels and shore bases should know the hand and communication signals and protocol for controlling crane operations.

### **7.1.4.2 Hand Signals**

An agreed method of hand signals should be used. As per the OHS Regulations, all personnel at the workplace are required to know the hand signal for "emergency stop." If no other standard hand signal practice has been established, the instructions described in API RP 2D and API RP 2D-2 should be adopted.

### **7.1.4.3 Radio Communication**

During cargo handling to and from an offshore supply vessel there should be direct radio contact between the Crane Operator, the banksman and vessel personnel involved in the lift (e.g., bridge and deck lead person).

The Crane Operator (or handlers and users of materials handling equipment) and banksman should maintain two-way radio communication when performing blind lifts.

Protocols should be established for the use of two-way radio communication.

Radio command and protocol should be clearly understood by the users involved in the lifting operation.

## 7.2 Safe Lifting Operating Practices

Safe lifting operating practices that have evolved through experience should be taken into consideration during the development of procedures. Such practices are classified below and discussed separately:

- General safe lifting operating practices (inboard and outboard lifts).
- Loading/offloading offshore supply vessels.
- Handling drilling tubulars.
- Non-routine/complex lifts.
- Use of tag lines.
- Use of hands-free devices.

In addition, procedures should take into consideration manufacturer recommendations, relevant codes or standards applicable to that type of equipment and measures identified from risk assessments. Additional guidance on safe lifting practices can be found in International Association of Oil and Gas Producers document "Lifting and Hoisting Safety Recommended Practice, Report #376" and other documents referenced in Part 2.1.5.

### 7.2.1 General Safe Lifting Operating Practices (Inboard and Outboard Lifts)

#### 7.2.1.1 Prior to a Lift

- All lifts should be completed under a control of work system, which may include a permit to work.
- Blind lifts that are considered complicated or complex should only be completed under an approved job safety analysis that has been reviewed and signed off by all participants prior to start of the lifting operation.
- Daily pre-use inspections should be completed on materials handling equipment at the start of each shift in accordance with operating procedures (which should include the referenced standards and any identified risk control measures) and the manufacturer's recommendations.
- Materials handling equipment should also be removed from service if it is suspected that the equipment might have been damaged as a result of an incident, was overloaded, operated incorrectly or subject to other physical or environmental conditions that may have affected its safe operation.
- All safety devices should be fully operational prior to the start of lifting operations. Overrides of certain devices, such as

slewing or boom-down limits on offshore cranes, may be permitted as long as such overrides are in accordance with manufacturer's operating instructions and accompanied with a hazard assessment and risk analysis. The device overridden should be initiated under a work permit, reviewed at the start of each shift, recorded in a logbook and override removed as soon as the specific task has been completed.

- Lifts should only be made with materials handling equipment that can be identified by an identification tag, serial number if applicable, SWL details, and current colour code.
- Where lifts are being undertaken, including through hatch ways, the area should be barricaded, and signs posted until the lifting operations have been completed.
- When exclusion zones cover multiple deck levels or include habitable spaces or structures that do not provide dropped load protection, barricades and signage should be erected to prevent personnel from entering those areas. Personnel performing the lift to confirm these areas are free from non-essential personnel before materials handling equipment is operated.
- Loose items lifted by materials handling equipment should be transported in Containers or Portable Offshore Units with coverings to ensure materials will not become dislodged.
- The handling or lifting of wooden crates or pallets (including purpose-built boxes or packing cases) by the means of slings or straps, should be avoided.
- Flat woven webbing slings should not be used for general cargo or Container handling. Where wire rope may cause damage to the lifted component, flat woven webbing slings may be used during an inboard or subsea lift to lift such equipment as a heavy valve into place for further assembly.
- Container doors should be secured at all times when not in use.

The Crane Operator (or handler or user of other materials handling equipment) should, prior to the start of a lift, ensure the following steps are completed along with any other required actions:

- The pre-use inspection has been completed.
- All lighting for lifting areas and the materials handling equipment is functional and adequate for lifting operations.
- Noted deficiencies that affect the safe operation of materials handling equipment have been corrected.

- Brakes, if equipped, are operationally tested each time a load approaching the rated load is to be handled.
- The lift operation has been discussed and properly risk-assessed with the crew involved in the lift.
- The load is slung properly.
- Multiple part lines are not twisted around each other in such a manner that all of the lines will not separate upon application of load.
- Communications and line of sight with the Banksman (if required) have been established.
- The correct load chart is being utilized for the lift.
- Any areas along the lift path that have potential for collision with the lift or the materials handling equipment have been reviewed.

The Banksman should, prior to the start of a lift, ensure that the following steps are completed along with any other required actions:

- The cargo manifest including load weights are reviewed with the Crane Operator or handler or user of other materials handling equipment) and rigger.
- Any piece of unidentified (missing or incorrect colour code, SWL, tag number, etc.) or suspect materials handling equipment is quarantined.
- Containers and Portable Offshore Units are inspected for deficiencies and to ensure goods are properly stowed and secured.
- Escape routes have been identified should a problem develop during the lifting operation.
- The lifting and receiving corridor is clear of obstructions and unassigned personnel.
- A clear line of sight is established, and a method of communication is agreed between the Banksman and the Crane Operator (or handler or user of other materials handling equipment).
- The load is being lifted directly up, that is, hook is over lift (no side-loading).
- That no persons enter a Container or Portable Offshore Units while it is attached to materials handling equipment or are adjacent to equipment when it is near the hook of the materials handling equipment.



The rigger should, prior to the start of a lift, ensure that the following steps are completed along with any other required actions:

- Containers and Portable Offshore Units are inspected for deficiencies and to ensure goods are properly stowed and secured.
- Any piece of unidentified (missing or incorrect colour code, SWL, tag number, etc.) or suspect materials handling equipment is quarantined.
- Sling legs are not twisted or snagged prior to hook-up.
- The shortest slings practical are used, provided the load limit and sling angle as identified on the tag is not exceeded.
- Pins and shackles are properly secured in accordance with manufacturer's instructions.
- Tag lines are installed where appropriate.
- The load hooks, swivels and safety latches are working correctly.
- Hands-free devices are available for use, if required.
- A safe area for retreat is identified.

#### **7.2.1.1 During a Lift**

The following should be considered for all lifts:

- The load to be lifted to be within the SWL capacity of the offshore crane as listed in the approved load chart at all boom radii. If a subsea lift is being performed, an approved load chart for subsea lifting along with associated limitations should be approved, made available and adhered to.
- The operational or environmental limits of materials handling equipment should be adhered to at all times during the lifting operation.
- Where fitted on any type of offshore crane, the lift mode for the safe lift indicator (SLI) should be set to static mode for onboard lifts, to the appropriate dynamic mode for outboard lifts, and to Personnel Transfer mode for Personnel Transfer lifts.
- Safety alarms should be strictly adhered to at all times. Actions must be taken immediately to place the materials handling equipment in a "safer condition" should a safety limit alarm or a cut-out limit engage.
- The Crane Operator (or handler or user of other materials handling equipment) should only respond to signals from the

Banksman assigned to oversee the lifting operation, unless an emergency stop signal is given by another person.

- The Banksman should maintain a clear line of sight with the Crane Operator (or handler or user of other materials handling equipment) at all times. If the line of sight is broken for any reason, the lifting operation should cease immediately and resume only at the Crane Operator's (or handler or user of other materials handling equipment) discretion after communication is re-established.
- In the case of blind lifts, the assigned Banksman should make every effort to maintain visual contact with the Crane Operator (or handler or user of other materials handling equipment) and the rigger at the load.
- In situations where this isn't possible multiple banksmen are to be used to assist with the safe handling of the lift. Handover of multiple Banksman is done using communication protocols in place.
- The Banksman should always defer if necessary to a line of sight with the Crane Operator (or handler or user of other materials handling equipment) rather than with the rigger or additional banksman.
- If the view of the primary Banksman is obstructed, an additional Banksman should be provided, in which case communications protocols should be agreed before the lift.
- The Banksman should not perform any other duties during lifting operations.
- Banksmen and riggers should wear high-visibility, reflective vests or clothing and they should be differentiated from other personnel. Banksman to be easily identifiable from riggers. High-visibility gloves should be used to communicate hand signals.
- No person should go under a suspended load. Personnel should not go near or touch the load until the Crane Operator (or handler or user of other materials handling equipment) has placed the load close to its final resting position and the Banksman (if present) has instructed them to do so.
- Loads that could require hands on for final positioning must be risk assessed and confirm no lateral movement before using this method. Only the assigned rigger should attach and detach the load from the load hook.
- The Crane Operator (or handler or user of other materials handling equipment) should stop the lifting operation if

physical environmental conditions exceed approved limits or otherwise becomes a hazard to the safe lifting operation.

- Containers, Portable Offshore Units and other equipment should only be positioned in approved landing areas of known load bearing capacity. Approved storage and landing areas should be identified by non-skid surface and the borders clearly marked.
- Placement of Containers or other equipment should not impede the emergency escape routes or block access to safety equipment.
- Offshore pedestal cranes should not be operated while a helicopter is landing or taking off. The boom should be positioned and secured against swinging so there will be no interference with flight operations. Further guidance can be found within the UK CAA's CAP 437 Standards for Offshore Helicopter Landing Areas.
- At no time should a load be lifted over restricted swing or lifting areas, areas where personnel may be present or areas where equipment is being operated (e.g., live process equipment, subsea production systems, etc.) that may pose a hazard to personnel in the event that a failure in the materials handling equipment occurs. If a person enters the lifting area, personnel involved in the lifting operation should stop the operation until it is safe to proceed.
- Work should not be permitted to be conducted under a suspended load.
- If materials handling equipment is exposed to a caustic or corrosive environment (e.g., H<sub>2</sub>S), it should be assessed by a Competent Person.

### **7.2.2 Loading and Offloading Supply Vessels (Outboard Lifts)**

Safe work practices developed for the preparation and performance of loading and offloading a supply vessel should take the following into consideration:

- Only performed when it is safe to do so.
- A cargo manifest should be prepared at the shore base for outbound lifts. The manifest should be made available to the Crane Operator prior to unloading the supply vessel.
- A cargo manifest should be completed at the offshore site for inbound lifts and be provided to the shore base.

- The cargo manifest should include the weights of each load, a description of the load and identification of any hazardous materials. Hazardous materials must be accompanied by relevant safety data sheets, TDG and IMDG documents in accordance with the regulations that apply.
- The dynamic mode should be set for outboard lifts. The dynamic mode indicator should be set for the latest recorded significant sea state condition. If only one dynamic mode is programmed into the safe load indicator, it should equate to the maximum significant sea state condition permitted for the crane.
- The Crane Operator should establish radio communication with the supply vessel personnel assigned to oversee the lifting operation from the vessel deck.
- Signaling methods and protocol should be verified between the Crane Operator, Banksman and vessel personnel assigned to oversee the lifting operation.
- The supply vessel should have sufficient vessel thrust capacity to keep the vessel on station during the lifting operation.
- The crane boom should be maintained at an angle sufficient to allow clearance with the supply vessel if the supply vessel drifts away from vertical while in the final stages of completing the lift.
- Personnel on the supply vessel involved in the lifting operation should wear high visibility, reflective vests over their coveralls so that the Crane Operator can keep track of their movements. Strobe lights on the helmet or shoulders of personnel involved in the lifting operation on the supply vessel have proven to be an effective means of visual contact by the Crane Operator during the period between dusk and dawn.
- If the supply vessel moves outside the installation loading area the Crane Operator should cease the lifting operation immediately and resume only when conditions are favorable to ensure a continued safe lifting operation.
- The load should be raised or lowered over water as much as practicable rather than over the supply vessel aft deck.
- Lifting operations should be undertaken under adequate lighting conditions to ensure adequate visibility between personnel on the supply vessel and Crane Operator.
- Personnel on the supply vessel should only approach the lift to detach the sling from the load hook after the Crane Operator has placed the lift in its final resting place on the vessel deck and the Crane Operator has communicated to vessel

personnel that it is safe to detach. After detaching the sling from the load hook, the “all clear to retrieve the load hook” signal can be given to the assigned signaler on the vessel who will, in turn, signal the Crane Operator to lift the hook at their discretion.

- Personnel on the supply vessel should stand well clear of the load once it has been attached to the crane load hook, then give the “all clear to lift the load” instruction to the vessel signaler who will, in turn, signal the Crane Operator to lift at their discretion.
- The Crane Operator should only respond to instructions from the Banksman, unless an emergency stop signal or instruction is given. Any person in the workplace may give the emergency stop signal or instruction.
- Consideration should be given to the placement of heavy lifts on the supply vessel to accommodate the crane boom angle and the SWL required for the lift.
- Containers and Portable Offshore Units should be secured on supply vessels in such a way that personnel do not have to move between loads to release the load binders.
- Priority lift(s) on supply vessels should be located so that they can be removed without releasing other deck cargo sea fastenings.

### **7.2.3 Handling Tubular Goods**

Safe work practices developed for handling tubular goods should take the following into consideration.

- Certified tubular transportation devices, such as rack systems, frames or skids should be used where practicable and particularly when transporting tubular goods with an outer diameter of less than 140 mm.
- Only tubular goods of the same diameter should be bundled together into a lift if it is not in a transportation device.
- Smaller individual joints or pup joints that cannot be stowed between securing arrangements and are less than 60% overall length of the average joint, should be secured as a separate item or shipped in a Container or Portable Offshore Units.
- When slinging a tubular goods bundle each leg of the sling set should be double wrapped around one end of the bundle one quarter the distance in from each end. The top end of the sling leg should be threaded through the reeving sleeve choked on

the same side and secured. A drop forged wire rope clip (bull dog or other clip) should be placed above the reeving eye to prevent the wire rope from slipping through the eye thereby slacking off when the load is lowered to its resting position.

- The tubular goods sling set should be assembled with two equal length legs of the same construction wire rope and SWL, heavy duty reeving hard eyes or thimbles at the load end, terminated at the top with soft loops, which can be shackled together and placed in load hook. Alternatively, the soft loops may be placed directly in load hook. Each sling should have a capacity greater than or equal to the weight of the load.
- To ensure that the load does not shift, tubular goods greater than 127 mm diameter, where practicable, should be bundled into odd numbers of joints in an effort to compact them together so that the middle joints are gripped by the outer ones and less likely to slide loose.
- The live end of the wire rope at the bundle should be kept from being positioned under the first wrap and under other bundles.
- Flat woven webbing slings should not be used to bundle, lift and transport tubular goods.
- Excessively long tubulars such as riser joints may require tag lines to assist with control of the load. Tag lines should be attached at the very ends of the bundle.
- Ensure ends caps and protectors where fitted are secured, and if open, are checked inside for loose items.
- Temporary storage of tubular goods on the installation should be stacked or segregated by pipe posts. Height of tubular bundles should not exceed the height of the structural pipe post.

#### **7.2.4 Non-Routine Lifts**

Safe work practices developed and implemented to identify the requirements for non-routine and high-risk routine lifts with any materials handling equipment. The safe work practices should take into consideration the following:

- Identification of the type of lifts that are considered to be non-routine or high-risk routine — lifts and should include heavy lifts and any lifts of personnel.
- Requirement for the lifts to be planned by Competent Persons.

- Roles and responsibilities for planning, approving and performing the lifts.
- The requirement for physical or environmental condition limitations to be identified for the lift.
- Non routine lifts should be performed under the permit to work system and include an operating procedure or a job safety analysis that has been reviewed by technical and operational personnel.

The Crane Operator (or handler or user of other materials handling equipment) and Banksman (if required) should ensure the load is stable and within the SWL capacity of the materials handling equipment and the landing area is suitable for the load before proceeding with the lift.

Where practical in non-routine or high-risk routine inboard lifts, the load should be lifted from its initial position a few inches and held there for a short period of time to assess the weight and stability of the load.

### **7.2.5 Load Positioning**

Safe work procedures developed for the load positioning should take into consideration risk assessments to determine which method reduces the contact between the handler and the load to as low as reasonably practicable until the load is safely landed and any stored energy has been depleted.

The following should be considered with respect to selection and construction of tag lines:

- Tag lines should be free of knots.
- Tag lines should have the ends sealed so that the ends do not fray.
- Tag lines should be no longer than necessary to reduce the likelihood of entanglement.
- The length of tag lines should be such that the rigger can be in a safe location for the duration of the lift.

The following should be considered for the use of tag lines:

- Tag lines should not be used during routine backloading of supply vessels.

- A rigger should be assigned to each tag line.
- Tag lines should not be looped around the wrist or any other part of the body.
- Tag lines should be attached to the very end(s) of a long load.
- Tag lines should never be used as the means to control the lift during adverse physical environmental conditions.
- Tag lines should be held so that the rigger can easily release the line if the load swings. This is to prevent throwing the rigger off balance or into a more dangerous position.
- Tag lines should not be detached from the load until the Crane Operator or handler or user of other materials handling equipment) and Banksman (if required) have positioned the load in its final location, with no load on the lifting gear.
- Tag lines should not be temporarily attached or looped around adjacent structures in an attempt to control the load.
- A rigger should not go near or beneath a load to retrieve a tag line.

### **7.2.6 Use of Hands-Free Devices**

Consideration should be given to providing personnel with hands free devices such as grab hooks and handling tools/poles for lifting, guiding, handling and maneuvering loads and tubulars. If devices are used, procedures should be developed, and instructions provided in the use of these devices.

## **7.3 Handling Offshore Containers and Portable Offshore Units**

This section identifies additional key considerations for handling offshore Containers and Portable Offshore Units.

### **7.3.1 Receiving Containers at Shore Base Facilities**

For offshore Containers that have been sealed for security purposes, reasonable efforts should be made to confirm the cargo within the Container is secured.

Closed but not sealed Containers arriving at the shore base should be opened and checked to ensure the cargo is secure and unlikely to shift during transit.



### 7.3.2 Certification Date

There should be sufficient time left in the certification period stamped on the Container or Portable Offshore Unit plate to permit the equipment to return from the Marine Installation or Structure requiring a Certificate of Fitness prior to the expiry date. In the event a Container or Portable Offshore Unit is located offshore after the expiry date has passed, the following course of action should be followed:

- Place a placard or sticker on the front of the Container or Portable Offshore Unit with a statement similar to this:  
"Container is out of certification and is not to be returned offshore until recertified."
- Notify the Competent Person responsible for lifting on the installation that an expired Container or Portable Offshore Unit has been identified. The Competent Person should either:
  - Complete the inspection of the Container or Portable Offshore Unit in accordance with the test method described in this Safe Lifting Practice (Part 3.0), or
  - Evaluate the Container or Portable Offshore Unit to determine if it is fit for a one-time lift, when empty, to return to shore base. Upon receipt at the shore base, the Container or Portable Offshore Unit is to be identified and segregated, or otherwise controlled to prevent its accidental reuse prior to recertification.

### 7.3.3 Bottom Lift Pad Eyes

Skid-mounted equipment or other lifting devices fitted with pad eyes on the bottom outside frame should be lifted with the use of a spreader bar and sling set in cases where the load could interfere with the sling set. When the center of gravity is above the lift points a spreader beam should be used to stabilize the load.

### 7.3.4 Pre-Use Check

The handler or user of Containers should carry out a pre-use check to ensure that the Container has appropriate certification and periodic inspection records (by means of the plates and accompanying documentation) and is carrying no more than the

maximum allowable Payload. In addition, the pre-use check ensures no gross damage or defects are present on either the Container or the lift set. The inspection plate is not marked during this type of inspection.

Containers should be removed from service if it is suspected that the Container might have been damaged as a result of an incident, was overloaded or subject to other physical or environmental conditions that may have affected its safe operation.

Guidance for the contents of the pre-use check is provided in Appendix 2.

## **7.4 Personnel Lifting**

This section identifies additional key considerations for personnel lifting operations, including Personnel Transfers by crane and personnel lifting operations using hoists.

### **7.4.1 Certified Equipment**

Any equipment used for personnel lifting operations should be designed, fabricated, maintained, inspected, and certified.

### **7.4.2 General Lifting Practices**

Personnel lifts should only be undertaken when it is not practicable to accomplish the task by less hazardous means. Personnel lifts, where practical, should be eliminated by design or the hazards mitigated by such means as erecting scaffolding platforms.

Documented procedures should be in place for all lifts involving personnel. Procedures should take the following into consideration:

- Identify when personnel lifting operations should take place.
- Identify the person who authorizes personnel lifting.
- Outline the duties and responsibilities of all participants.
- Identify that all personnel lifts are to be undertaken under a work permit.
- Include the requirement for a hazard analysis to identify

hazards associated with personnel lifting. The hazard analysis and any associated operating procedure should be specific for the installation/vessel and lifting equipment being used and should be completed by technical and operational personnel.

- The hazard analysis should include the consideration of simultaneous operations. The operating procedure and/or hazard analysis should be reviewed by all participants at a “tool box talk” and signed off and dated by each participant.
- Describe training of each individual assigned to plan, manage, participate in and supervise the personnel lifting operation — personnel being transferred or lifted should receive appropriate training on use of the equipment and their safety components.
- List equipment requirements to ensure a safe lifting operation and require equipment to be used for personnel lifting operations to be used for that purpose only.
- Identify rescue and recovery arrangements.
- Identify that the rescue and recovery equipment (e.g., fast rescue craft) should be readily available during the lift operation.
- Identify that rescue and recovery arrangements (e.g., rescue from a fast rescue craft) are to be practiced at regular intervals.
- List personal protective equipment to be worn.
- Define the physical and environmental limitations for personnel lifting.
- Describe the communication protocol between the participants, including communications with the rescue team and in the case of Personnel Transfer, with the vessel.
- Include inspection, testing and maintenance procedures, along with pre-use inspection requirements.
- Include the requirement that personnel lifts should only be conducted where there is line of sight between the user or handler of material handling equipment and the Banksman and between the Banksman and the person being lifted.
- Include the requirement that test lifts without personnel should be performed where there is a confined space, potential for snagging or other hazard.

### **7.4.3 Pre-Use Inspections**

The pre-use inspection should include the following:

- Verification that inspection and certification of the personnel lifting, or Personnel Transfer device is current.
- Verification that any loose lifting gear used in the lift has current colour coding.
- Visual examination of all lifting components to ensure that no visible damage or defects are present.
- Verification that secondary safety devices (for example, safety pendant or lanyard) are installed.
- Verification that lockable latches are pinned in the locked position to secure the sling in the bowl of the hook.
- Verification that personnel being lifted have been briefed or trained on the operating procedures and safety precautions for the particular device.
- Verification that the hazard analysis and work permit have been completed.

#### **7.4.4 Personnel Lifting Operations using Cranes**

The following are additional considerations for personnel lifting operations using cranes including Personnel Transfers and work over the side conducted from work baskets suspended from a crane:

- Crane Operator and Banksman should have a clear view of the loading and landing area.
- The deck of the vessel should be cleared of all cargo in the loading and landing area.
- The Banksman should be positioned so as not to lose sight of the personnel lifting device during the lift.
- A tag line should be affixed to the personnel-lifting device. The tag line should have a minimum length of three metres.
- A safety pendant or lanyard should be installed between the crane wire (above the load block) and the upper master link of the sling assembly if a crane is used.
- The vessel used for Personnel Transfers should have sufficient thruster capacity to maintain station during transfer operations.
- Means of protecting the Personnel Transfer devices from weather, ultraviolet degradation and physical damage when stored should be provided.
- A sub-link assembly and master link should be used to connect a four-legged sling to the load block when using work baskets.
- Load hooks in the load path connecting the basket to the

lifting mechanism should be capable of being locked and pinned to ensure the connecting shackle will not dislodge from the hook under any load.

- It is acceptable to remove the load hook and connect the Personnel Transfer device and bridle directly to the headache ball with a shackle meeting SWL requirements for Personnel Transfer, as long as this arrangement has been approved by the Certifying Authority on a Marine Installation or Structure requiring a Certificate of Fitness or by the Classification Society for all other Marine Installation or Structures.
- Personnel being transferred to a vessel should at least wear approved protective suits that provide for flotation and thermal protection while allowing for good manual dexterity.
- The crew of the vessel used for Personnel Transfers should be required to conduct a pre-use check of the Personnel Transfer device and associated rigging prior to a lift from the vessel. Instruction should be provided.
- The standby vessel should be in close attendance and the crew of the fast rescue craft should be notified prior to Personnel Transfers or work over the side. If a standby vessel is not in attendance, a Fast Rescue Craft (FRC) or equivalent means of rescue from the water should be available and ready for immediate deployment.

#### **7.4.5 Personnel Lifting Operations with Hoists**

The following are additional considerations for personnel lifting operations using hoists:

- An independent fall protection system should be designed, approved, and installed at locations where personnel lifting requiring a harness may be required.
- Moving or rotating equipment, other than movement solely due to motion compensating, should not be operated in or near the area of personnel lifting operations using hoists. Boundaries and limitations for simultaneous equipment operation should be identified in the procedure.
- A log of activities should be maintained, and the method outlined in the procedure.
- A log of tools and items being taken aloft should be maintained. Tools and items taken aloft should have retention devices and be secured at all times.
- Fixed wire stabbing boards are optional and may be used as required.

- Bosun chairs are not recommended for lifting personnel.
- “Safety lanyards should be of such a length that if activated the free fall distance is kept to a minimum”
- Full body harnesses should be used when lifting personnel from the hoist. A shock-absorbing lanyard between the D-ring and the lifting hook is optional but not recommended, particularly if the associated vertical fall arrest line to which the person is attached is made of fibrous material.
- A Banksman should be used at all times during personnel lifting operations using a hoist.
- Personnel lifting operations using hoists should not be performed through mouse holes or other areas that pose similar hazards.
- Fall arrest systems should also be inspected, tested and maintained in accordance with the standards and regulations which apply to this equipment by personnel who are competent to do so.

## Appendix 1: Terms of Reference

The Atlantic Canada Offshore Petroleum Safe Lifting Practices Working Group

### Terms of Reference

**Topic:** Code of Practice Atlantic Canada Offshore Petroleum Industry Safe Lifting Practices.

**Purpose:** The purpose of this Working Group is to review and update Atlantic Canada Offshore Petroleum Industry Safe Lifting Practice (SLP) Respecting: Offshore Pedestal Cranes, Offshore Containers, Loose Gear, Other Lifting Devices and Operational Best Practices. As part of the 5-year document review, the intent is to also establish it as a Code of Practice applicable to all Workplaces defined under the *Canada-Nova Scotia Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*.

**Scope/Application:** The Working Group should ensure that the Code of Practice is up to date and current with the industry best practices, regulations and standards. Collaboration is required with the current regulatory reform efforts, Frontier and Offshore Regulatory Renewal Initiative (FORRI) and Atlantic Offshore Occupational Health and Safety Initiative to ensure the Code of Practice is aligned with future regulations.

In addition, the Code of Practice should incorporate best practices for drilling hoisting equipment.

**Working Group Members:** The Working Group should consist of appropriate representation from east coast Canada offshore Operators working under an authorization, non-operator employers, representatives from the offshore Workforce, certifying authorities, Suppliers or providers of service, a representative of the CAODC and the C-NLOPB / CNSOPB.

- *Canada-Newfoundland and Labrador Accord Implementation Act (subsections 205.016 (1) & 205.021(1))*
- *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act (subsections 201.13(1) & 201.18(1))*
- *Canada-Nova Scotia Offshore Petroleum Resources Accord Act (subsections 210.016 (1) & 210.021(1))*
- *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act (subsections 201.13(1) & 201.18(1))*
- *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Nova*

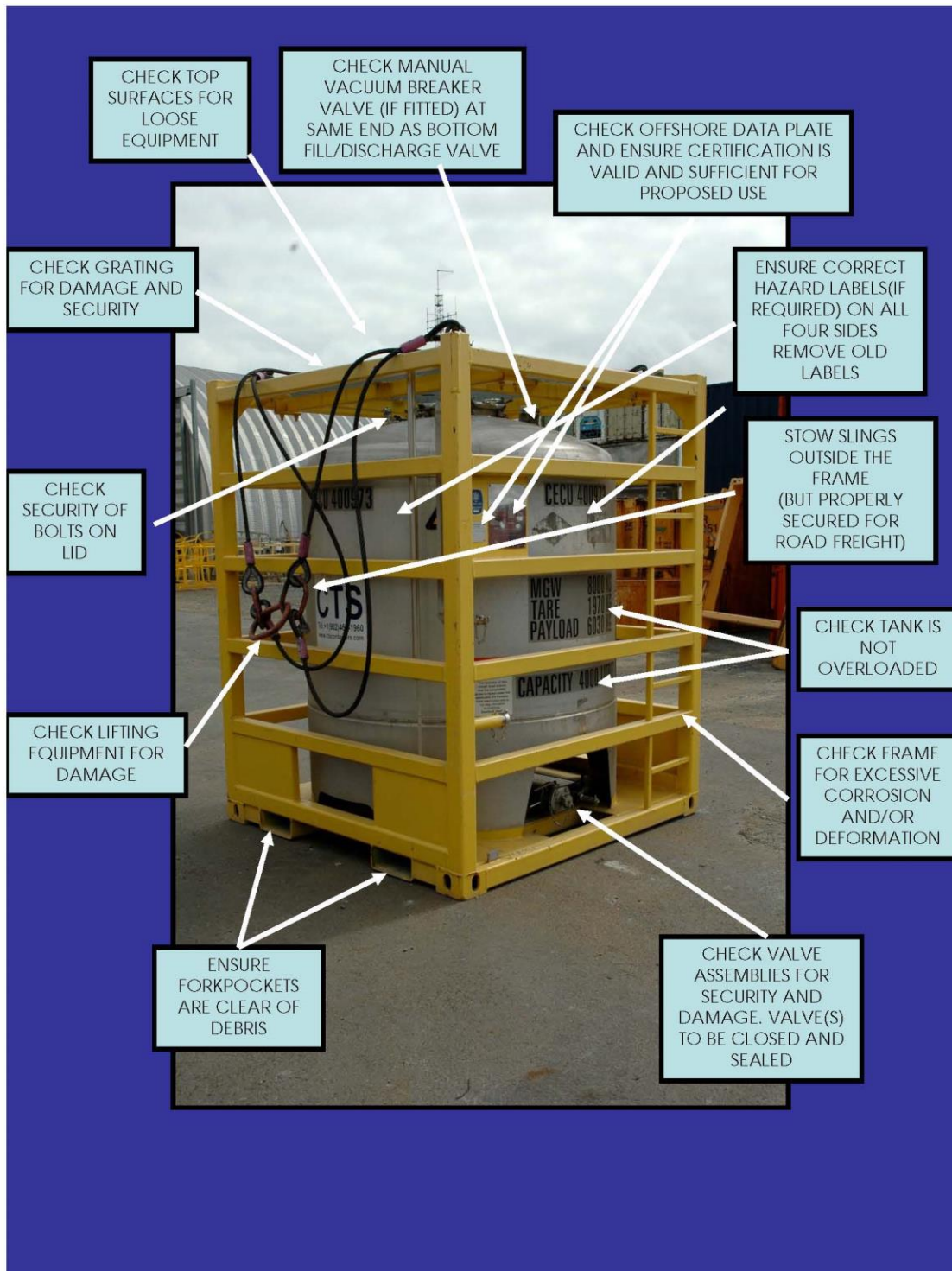
*Scotia Act (subsections 202.Q(1) & 202.V(1))*

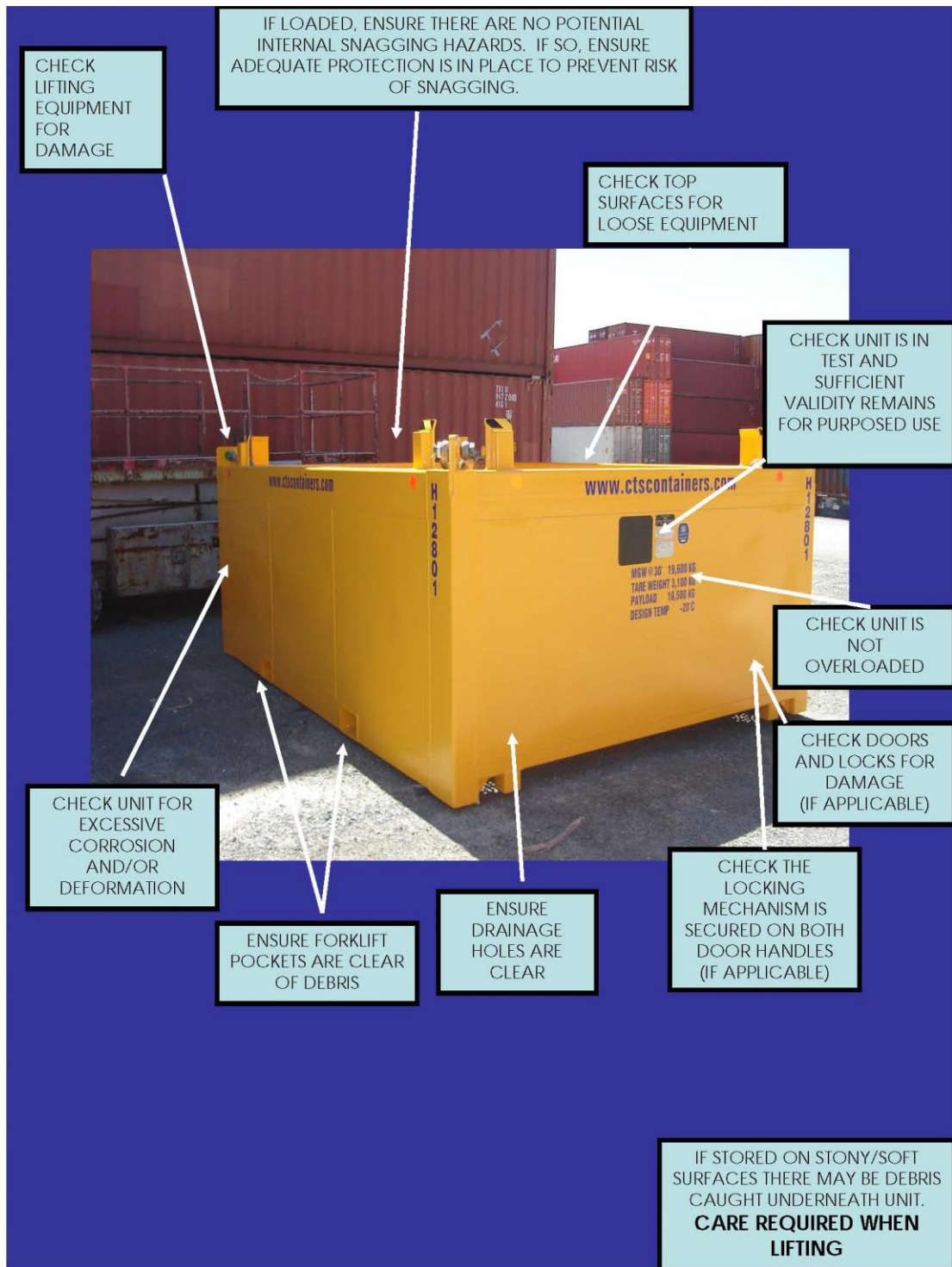
- *Newfoundland Offshore Petroleum Installations Regulations*
- *Nova Scotia Offshore Petroleum Installation Regulations*
- *Canada-Newfoundland and Labrador Offshore Area Occupational Health and Safety Regulations*
- *Canada-Nova Scotia Offshore Area Occupational Health and Safety Regulations*
- *Newfoundland Offshore Certificate of Fitness Regulations*
- *Nova Scotia Offshore Certificate of Fitness Regulations*
- *Newfoundland Offshore Petroleum Drilling and Production Regulations*
- *Nova Scotia Offshore Petroleum Drilling and Production Regulations*



## Appendix 2: Guidance for Pre-Use Check of Containers







### Appendix 3: List of References

1. ABS Guide for Certification of Lifting Appliances, 2021.
2. ABS Guide for the Classification of Drilling Systems, 2021.
3. API RP 2A-WSD - Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Platforms—Working Stress Design, 2014, Reaffirmed 2020.
4. API Spec 2C – Specification for Offshore Pedestal-Mounted Cranes, 2020.
5. API RP 2D - Recommended Practice for Operation and Maintenance of Offshore Cranes, 2014.
6. API RP 2D-2 – Training for Offshore Pedestal-Mounted Crane Riggers, Operator and Inspectors, 2020.
7. API Spec 4F - Specification for Drilling and Well Servicing Structures, 2020.
8. API RP 4G – Recommended Practice for Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures, 2020.
9. API Spec 7K – Specification for Drilling and Well Servicing Equipment, 2017.
10. API RP 7L – Recommended Practice for Procedures for Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment, Reaffirmed 2019.
11. API RP 8B - Recommended Practice for Inspections, Maintenance, Repair and Remanufacture of Hoisting Equipment, 2014, Including Addendum 1 (2019) and Addendum 2 (2021) and Errata 1 (2019).
12. API Spec 8C – Specification for Drilling and Production Hoisting Equipment (PSL 1 and PSL 2), 2012, Reaffirmed 2019, Including Errata 1 (2014) and Errata 2 (2020).
13. API Spec 9A - Specification for Wire Rope, 2020.
14. API RP 9B, Recommended Practice for Application Care and use of Wire Rope for Oil Field Service, 2015, Including Addendum 1 (2020).
15. ASME Boiler and Pressure Vessel Code, 2021.
16. ASME B20.1, Conveyors and Related Equipment, 2021.
17. ASME B30.1, Jacks, Industrial Rollers, Air Casters, and Hydraulic Gantries, 2020.
18. ASME B30.2, Overhead and Gantry Cranes, 2022.
19. ASME B30.5, Mobile and Locomotive Cranes, 2021.
20. ASME B30.7, Winches, 2021.
21. ASME B30.9, Slings, 2021.
22. ASME B30.10, Hooks, 2019.
23. ASME B30.16, Overhead Underhung and Stationary Hoists , 2022.
24. ASME B30.17, Cranes and Monorails (with Underhung Trolley or Bridge), 2020.
25. ASME B30.20, Below-the-Hook Lifting Devices, 2021.
26. ASME B30.21, Lever Hoists, 2014, Reaffirmed 2019.
27. ASME B30.26, Rigging Hardware, 2015, Reaffirmed 2020.
28. ASTM A574, Standard Specification for Alloy Steel Socket-Head Cap Screws, 2021.
29. ASTM A906/A906M-02, Standard Specification for Grade 80 and Grade 100 Alloy Steel Chain Slings for Overhead Lifting, 2022.
30. ASTM F1145, Standard Specification for Turnbuckles, Swaged, Welded, Forged, 2022.
31. BS 2853: British Standard Specification for the testing of steel overhead runway beams for hoist blocks, 2011
32. BS 4429: British Standard Specification for Rigging Screws and Turnbuckles for General Engineering, Lifting Purposes and Pipe Hanger Applications, 1987.
33. BS 463-1: Specification for Sockets for Wire Ropes; Inch Units, 1958.
34. BS 463-2: Specification for Sockets for Wire Ropes; Metric Units, 1970.

35. CNSOPB Notice-Safety Alert Nov 30, 2018, Safety Notice – Bolt Type Shackle Inspection. <https://www.cnsopb.ns.ca/publications/notice-safety-alert-bolt-type-shackle-inspection>"in the Appendix.
36. CSA B167 Overhead cranes, gantry cranes, monorails, hoists and jib cranes, 2016, Reaffirmed 2021.
37. CSA B335, Safety Standard for Lift Trucks, 2020.
38. CSA B51: Boiler, Pressure Vessel, and Pressure Piping Code, 2019.
39. CSA S16, Design of Steel Structures, 2019.
40. CSA Z150, Safety Code on Mobile Cranes, 2020.
41. DIN 582, Lifting Eye Nuts, 2018.
42. DNV-OS-E101 Drilling Facilities, 2021.
43. DNV-RP-N201 Lifting Appliances used in Subsea Operations, 2021.
44. DNV-ST-E271 2.7-1 Offshore Containers, 2021.
45. DNV-ST-E272 2.7-2 Offshore Service Modules, 2016.
46. DNV-ST-E273 2.7-3 Portable Offshore Units, 2022.
47. DNV-ST-0377 Shipboard Lifting Appliances, 2022.
48. DNV-ST-0378 Offshore and Platform Lifting Appliances, 2021.
49. EN 818-1: 1996+A1, Short link chain for lifting purposes - Safety - General conditions of acceptance, 2008.
50. EN 818-4: 1999+A1, Short link chain for lifting purposes – Safety – Part 4: Chain Slings – Grade 8, 2008.
51. EN 818-5: 1999+A1, Short link chain for lifting purposes – Safety – Part 5: Chain Slings - Grade 4, 2008.
52. EN 1492-1: 2000+A1 Textile Slings – Safety – Part 1: Flat Woven Webbing Slings, made of man-made fibres, for general purpose use, 2008.
53. EN 1492-2: 2000+A1 Textile Slings – Safety – Part 2: Roundslings made of man-made fibres, for general purpose use, 2008.
54. EN 1677: Series (as applicable) - Components for slings.
55. EN 10204: Metallic Products. Types of Inspection Documents, 2004.
56. EN 12385: Series (as applicable) - Steel wire ropes.
57. EN 13000: Cranes. Mobile cranes, 2014.
58. EN 13157:2004+A1: Cranes. Safety. Hand powered cranes, 2009.
59. EN 13411: Series (as applicable) – Terminations for steel wire ropes.
60. EN 13414: Series (as applicable) - Steel wire rope slings.
61. EN 13852-1: Cranes - Offshore Cranes - Part 1: General-purpose offshore cranes, 2013.
62. EN 13852-2: Cranes - Offshore Cranes - Part 2: Floating cranes, 2004.
63. EN 13889: 2003+A1 Forged steel shackles for general lifting purposes. Dee shackles and bow shackles. Grade 6. Safety, 2008.
64. EN 14492-2: Cranes. Power driven winches and hoists – Power driven hoists, 2019.
65. EN 14502-1: Cranes. Equipment for the lifting of persons. Suspended baskets, 2010.
66. EN 15011: 2011+A1: Cranes. Bridge and gantry cranes, 2014>
67. Federal Specifications (USA) RR-C-271G, Chains and Attachments, Carbon and Alloy Steel, 2011.
68. IADC Drilling Manual, 2015.
69. IMO International Maritime Dangerous Goods Code.
70. IMCA D 060/LR 006 Guidelines for Lifting Operations, 2022.
71. IOGP Report No. 376 Lifting and Hoisting Safety Recommended Practice, 2006.
72. IOGP Supplementary Specification to API Specification 2C Offshore Pedestal Mounted Cranes (Specification S-618).

73. IOGP Supplementary Specification to EN 13852-1 General-purpose offshore cranes (Specification S-617)
74. ISO 2408: Steel Wire Ropes—Requirements, 2017.
75. ISO 2415: Forged shackles for general lifting purposes - Dee shackles and bow shackles, 2022.
76. ISO 3056: Non-Calibrated Round Steel Link Lifting Chain and Chain Slings—Use and Maintenance, 1986, R2018.
77. ISO 3266: Eyebolts for General Lifting Purposes, 2010.
78. ISO 4309: Cranes, Wire ropes – Care and Maintenance, Inspection and Discard, 2017.
79. ISO 4762: Hexagon Socket Head Cap Screws, 2004.
80. ISO 7531: Wire rope slings for general purposes—Characteristics and specifications, R2022.
81. ISO 8792: Wire rope slings—Safety criteria and inspection procedures for use, R2022.
82. ISO 9001: Quality management systems – Requirements, 2015.
83. ISO 10425: Steel wire ropes for the petroleum and natural gas industries—Minimum requirements and terms of acceptance, 2003.
84. ISO 10855-1: Offshore Containers and associated lift sets - Part 1: Design, manufacture and marking of Offshore Containers, 2018.
85. ISO 10855-2: Offshore Containers and associated lift sets - Part 2: Design, manufacture and marking of lift sets, 2018.
86. ISO 10855-3: Offshore Containers and associated lift sets Part 3 - Periodic inspection, examination and testing, 2018.
87. ISO 13534 Petroleum and natural gas industries -- Drilling and production equipment -- Inspection, maintenance, repair and remanufacture of hoisting equipment, 2000.
88. ISO 13535: Petroleum and natural gas industries — Drilling and production equipment — Hoisting equipment, 2000, R2022.
89. ISO 13626: Petroleum and natural gas industries — Drilling and production equipment — Drilling and well-servicing structures, 2003, R2021.
90. ISO 14693 Petroleum and natural gas industries — Drilling and well-servicing equipment, 2003, R2018.
91. ISO 17558, Steel wire ropes, Socketing Procedures, Molten Metal and Resin Socketing, R2021.
92. ISO 19900: Petroleum and natural gas industries - General requirements for offshore structures, 2019.
93. ISO 19901-6: Petroleum and natural gas industries - Specific requirements for offshore structures - Part 6: Marine operations, 2009.
94. Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment, 2019.
95. Lloyd’s Register, Code for Lifting Appliances in a Marine Environment, 2022.
96. NORSOK R-003 Safe Use of Lifting Equipment, 2017.
97. Transport Canada Marine Safety Directorate TP 12245E, Web Sling Standard.
98. UNC-3A, Aerospace Industries Association, National Aerospace Standard -Screw Cap, Socket Head Hexagon, Corrosion Resistant Steel.