Foreword (1 June 2020)

This Guide has been developed in response to industry requests for an optional class notation to address arrangements where an Oil Carrier, Liquefied Gas Carrier or Chemical Carrier is provided with facilities to load or unload cargo with piping manifold located at the bow or stern of the vessel.

ABS currently has requirements for bow or stern loading and unloading arrangements of Oil Carriers, Liquefied Gas Carriers or Chemical Carriers in the ABS Rules for Building and Classing Marine Vessels (Marine Vessel Rules). This Guide consolidates the requirements in the ABS Rules for Building and Classing Marine Vessels for certifying bow or stern loading arrangements on these types of vessels.

The June 2020 edition includes updates to Section 1 and Section 2 of the Guide to update the requirements for “Oil Carriers” based on the Norwegian Oil and Gas recommended guidelines for Offshore Loading Shuttle Tankers.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.
GUIDE FOR THE CLASS NOTATION FOR BOW OR STERN LOADING AND UNLOADING (BLU OR SLU) FOR OIL CARRIERS, LIQUEFIED GAS CARRIERS OR CHEMICAL CARRIERS

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SECTION 1  Introduction

1  Scope and Application (1 June 2020)
This Guide covers the criteria for the optional BLU Notation (Bow Loading and Unloading arrangements) and the optional SLU Notation (Stern Loading and Unloading arrangements) on Oil Carriers, Liquefied Gas Carriers and Chemical Carriers classed with ABS.

This Guide includes the requirements for bow or stern loading and unloading arrangements in the following sections and the minimum class requirements for this type of system are contained in the 5C-1-7/3.3.3, 5C-8-3/8 and 5C-9-3/7 sections of the ABS Rules for Building and Classing Marine Vessels (Marine Vessel Rules) based on the type of carrier:

Section 2  Bow or stern loading and unloading arrangements (Oil Carriers)
Section 3  Bow or stern loading and unloading arrangements (Liquefied Gas Carriers)
Section 4  Bow or stern loading and unloading arrangements (Chemical Carriers)

3  Notations (1 June 2020)
This Guide applies to Oil Carriers, Liquefied Gas Carriers and Chemical Carriers with bow or stern loading and unloading arrangements. A vessel with bow loading and unloading arrangements that are in compliance with this Guide is eligible for the Notation BLU. A vessel with stern loading and unloading arrangements that are in compliance with this Guide will be eligible for the Notation SLU.

These Notations supplement the Class Notation e.g. Oil Carriers, Liquified Gas Carriers & Chemical Carriers.

Vessels which are classed as both Oil Carriers and Chemical Carriers, requesting optional BLU or SLU notation are to comply the requirements in Section 2 and Section 4.

5  Overview (1 June 2020)
Station keeping, cargo handling and communication between the vessel and offshore loading facility are vital to the safe operation of the vessel.

5.1  Station Keeping
The vessel must maintain position during approach, loading and departure, even in poor weather conditions. To address the station keeping requirements, acceptable means are to be provided such as dynamic position system or propulsion redundancy arrangements etc.

5.2  Cargo Handling
Depending on the infrastructure provided in the offshore facility, a vessel may need to accommodate different loading systems, which may include submerged turret loading, single point mooring and bow loading system. This Guide mainly focuses on the bow loading and unloading system.

5.3  Communications
Communication between the vessel and the loading facility is vital for the safe and successful loading operation. Redundant voice, telemetry and Relative Position Reference Systems (RPRS) are typically
required for these vessels. If personnel or instrumentation/monitoring indicate that the minimum safe operating conditions are not being met, an emergency shutdown and quick release is to be initiated.

5.4 Overview of Bow Loading and Unloading (BLU) System

A general overview of the bow loading system is provided below for easy reference to the various equipment involved for such arrangements and addressed elsewhere in this Guide. A high level overview and sequence of operations during bow loading operation are available in ABS Shuttle Tanker Advisory (2019).

FIGURE 1
Overview of Bow Loading System

7 Equipment (1 June 2020)

Where mooring equipment is designed as a part of the bow loading system, equipment used for bow loading is to be designed to the following requirements:

7.1 Ambient Temperature

Machinery and electrical installations shall be designed to a service temperature as follows:

i) External areas /Open Deck, -25 °C to 50 °C

ii) Enclosed areas, 0 °C to 50 °C. proper ventilation or air conditioning is to be provided for the spaces if temperatures outside these limits are anticipated.

7.2 Chain Stoppers and Fairleads

The vessel is to be fitted with bow chain stoppers and bow fairleads as per 3-5-2/7.1 TABLE 1 of the Marine Vessel Rules. Additional pedestal roller fairleads may be required for alignment purposes and a winch or capstan for the pick-up rope. The requirements for the supporting deck structure in way of all equipment are to be in accordance with 3-2-7/4, 3-5-1/11, and 3-5-1/15. of the Marine Vessel Rules.

i) A chain stopper for the mooring chafing chain with a hydraulic quick release device adequate for the vessel size (DWT) should be provided. It should be self-locking type, remote operated with a closing or opening time not exceeding 30 seconds.

ii) A tension meter with a minimum range of 0-350 tonnes should be provided to measure the tension in the hawser during operation.
The fairlead should be fitted with a roller complete with roller bearings in the bottom of the fairlead. The roller and all parts of the chafing chain should be covered with stainless steel material (non-sparking).

7.3 **Hardwood Protection on Deck**

The deck area between the chain stopper and the fairlead should be protected by 75 mm thick hardwood. The width of the hardwood layer should be twice the width of the fairlead. The hardwood should be fixed to the deck by recessed stud bolts/nuts, and a hardwood plug should cover the top.

9 **Submission of Design Plans and Data (1 June 2020)**

In addition to the submission of plans according to the requirements stated in Section 1-1-7 of the ABS Rules for Condition of Classification (Part 1), the following design plans and data are to be submitted:

- Booklet showing standard construction details for piping (see 4-6-1/9.5 of the Marine Vessel Rules)
- Details of the cargo piping from the cargo area to the bow or stern loading/unloading manifold including spill containment arrangements
- Hazardous area plan and electrical equipment data
- Plans and details as listed below:
  - Control station and monitoring
  - Emergency disconnect arrangements
  - Means of Communication
  - Positioning
  - Mooring arrangements
  - Safety installations and arrangements
  - Operation Manual
  - Trials and testing

Plans should generally be submitted electronically to ABS. However, hard copies will also be accepted.

11 **Definitions**

11.1 **Oil Carrier (1 June 2020)**

An Oil Carrier is a vessel designed and constructed to carry oil having flash points at or below 60°C (140°F) closed cup test in bulk, and includes vessels of similar types, such as combination carriers (Ore/Oil Carriers, etc.).

11.3 **Liquefied Gas Carrier**

A Liquefied Gas Carrier is a vessel designed and constructed for the transportation in bulk of liquefied gas or other products listed in Section 5C-8-19 of the Marine Vessel Rules, or Chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).

11.5 **Chemical Carrier (1 June 2020)**

A Chemical Carrier is a vessel designed and constructed for the carriage of any liquid product in bulk listed in Section 5C-9-17 of the Marine Vessel Rules, or Chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code).
11.7 **Cargo Area** *(1 June 2020)*

In Oil Carriers, the *Cargo Area* is that part of the vessel that contains cargo tanks, slop tanks and cargo pump rooms including cofferdams, ballast and void spaces adjacent to cargo tanks and also deck areas throughout the length of the vessel over the above-mentioned spaces.

In Liquefied Gas Carriers, the *Cargo area* is that part of the vessel which contains the cargo containment system, cargo pump and compressor rooms including deck areas over the length of the ship over the above-mentioned spaces. Where fitted, the cofferdams, ballast or void spaces at the *aft* end of the *aftmost* hold space or at the forward end of the forwardmost hold space are excluded from the cargo area.

In Chemical Carriers, the *Cargo area* is that part of the vessel that contains cargo tanks, slop tanks, cargo pump-rooms including cofferdams, ballast or void spaces adjacent to cargo tanks or slop tanks and also deck areas throughout the length of the ship over the above-mentioned spaces. Where independent tanks are installed in hold spaces, cofferdams, ballast or void spaces at the *aft* end of the *aftmost* hold space or at the forward end of the forwardmost hold space are excluded from the cargo area.

11.9 **Hazardous Areas**

Areas where flammable or explosive gases or vapors are normally present or likely to be present are known as *Hazardous Areas*. The flammable or explosive atmosphere may be expected to exist continuously or intermittently. Typically, the cargo area, spaces around cargo tank openings, spaces around disconnectable cargo oil pipe joints, etc., are to be regarded as hazardous areas. The word "hazardous", where used in this Guide, means the presence of a flammable atmosphere.

13 **Abbreviations** *(1 June 2020)*

*Abbreviations*

- DPS-Dynamic Positioning System
- ESD-Emergency Shutdown
- FMEA-Failure Mode Effects Analysis
- FPSO-Floating, Production, Storage and Offloading
- IGC Code-International Gas Carrier Code
- IMO-International Maritime Organization
- ISGOTT- International Safety Guide for Oil tankers and Terminals
- OCIMF-Oil Companies International Marine Forum
- SPM-Single Point Mooring
- STL-Submerged Turret Loading

15 **References** *(1 June 2020)*

- **a)** 140-Norwegian Oil and Gas recommended guidelines for Offshore Loading Shuttle Tankers
- **b)** MSC/Circ.474-Guidelines for Bow and Stern Loading and Unloading Arrangements and Unloading Arrangements on Oil Tankers, Rev. 1, June 2000.
- **c)** ABS Shuttle Tanker Advisory, September 2019
- **d)** Oil Companies International Marine Forum (OCIMF) Publications such as "OCIMF Guidelines for Offshore Tanker Operations"
SECTION 2 Oil Carriers

1 General (1 June 2020)
This Section consolidates requirements that are typically applicable to oil carriers with bow or stern loading/unloading arrangements to include requirements for control and monitoring, emergency disconnect arrangements, communication between receiving vessels and offshore terminal, vessel positioning including mooring, safety installations and arrangements, operational procedures as well as testing and trials of the associated systems with the bow or stern loading/unloading installation.

3 Cargo Piping System (1 June 2020)
The cargo piping for bow loading/unloading including swivels, pipes from manifold to inboard valve and/or for stern loading/unloading are to comply with the requirements of 5C-1-7/3.3.3 of the Marine Vessel Rules.

3.1 Cargo Piping outside Cargo Area (1 June 2020)
Cargo lines outside the cargo area are to be installed outside accommodation spaces, service spaces, machinery spaces and control stations. Pipe joints outside of the cargo area are to be welded, except for connections to the manifold or the loading and unloading equipment. Arrangements are to be provided for cargo lines outside the cargo area to allow easy draining to a slop tank or cargo tank and for cleaning and inerting.

3.3 Marking and Isolation (1 June 2020)
The cargo loading and unloading lines are to be clearly identified and provided with means of segregation from the cargo main line when not in use. The segregation is to be achieved by:

i) Two valves, located in the cargo area, which can be locked in the closed position, and fitted with means to detect leakage past the valves; or

ii) One valve together with another closing device providing an equivalent standard of segregation, such as a removable spool piece or spectacle flange.

3.5 Loading & Unloading Connections (1 June 2020)
The loading and unloading connections are to be fitted with a shutoff valve and a blank flange. The blank flange may be omitted if an equivalent means of closing is incorporated in the connection to the hose coupling or when a patent hose coupling is fitted.

An emergency disconnection system is to be provided for bow or stern loading arrangement as detailed in 2/11 of this Guide.

3.7 Hydraulic Equipment (1 June 2020)
Each active component shall be designed with fail-safe principle.

i) Hydraulic cylinders to move the loading manifold from stowed position to connecting position should be provided.

ii) The hose handling winch to lift the loading hose into mating position should be provided.
iii) Final positioning of the coupler's flange against the hose end flange should be made by the hydraulically operated coupler claws, in combination with cylinders positioning the coupler.

3.9 **Spill Containment (1 June 2020)**

A spill containment is to be provided under the inboard manifold with a means for transfer of the spillage contents to a slop or cargo tank. The tray is be suitably sized to contain a minimum of 1 m$^3$. The coaming height is not be less than 300 mm (12 in.).

Spray shields are to be fitted in way of the flange connections and valves located within the loading/unloading area where leakage may occur during operation.

3.11 **Bow Doors (1 June 2020)**

Bow doors are to meet the applicable requirements in 3-2-16/3 of the Marine Vessel Rules.

5 **Hazardous Areas and Electrical Systems**

5.1 **General (1 June 2020)**

If service spaces, machinery room or control stations are exposed to spray or fire from the bow or stern loading/unloading connections, they are required to have entrances, ventilation inlets and openings located at least 10 m away from loading/unloading connection area. Any access from the hazardous area e.g. bow or stern loading/unloading connection room to non-hazardous spaces in the bow or stern area e.g. manned control stations and hydraulic power pack spaces is to be provided a double door air lock of either type described below. These non-hazardous spaces in the bow or stern area are to have independent means of escape that do not pass through any hazardous area (e.g. bow or stern loading/unloading connection room).

5.3 **Air Locks (1 June 2020)**

Access from a hazardous area to a non-hazardous space is to be through double door air lock of either type described below:

5.3.1 **Type 1 Air Lock**

5.3.1(a) **Doors.**

Type 1 air lock are to consist of two gas-tight steel doors of the self-closing type, with no hold back arrangement, spaced at least 1.5 m (5 ft) but not more than 2.5 m (8 ft) apart. The space between two doors is to be provided with mechanical ventilation.

5.3.1(b) **Relative Pressurization.**

The non-hazardous space is to be maintained at over-pressure relative to the external hazardous area. The relative over-pressure or air flow is to be continuously monitored and so arranged that in the event of ventilation failure an audible and visual alarm is given at a manned control station and the electrical supply to all equipment (not of the certified safe type) is to be automatically disconnected. Upon request, a time delay on the disconnect may be given consideration by ABS if deemed necessary.

5.3.1(c) **Safety Precautions.**

Machinery necessary for propulsion and maneuvering, anchoring and mooring, the emergency generator and emergency fire pump, any safety equipment related to the bow or stern loading/unloading system where the shutdown of which could in itself introduce a hazard, is not to be located in spaces protected by a Type 1 air lock.

5.3.2 **Type 2 Air Lock**

5.3.2(a) **Doors.**

Type 2 air locks are to consist of two gas-tight steel doors of self-closing type, with no hold back arrangement, spaced at least 1.5 m (5 ft) but not more than 2.5 m (8 ft) apart.
5.3.2(b) Relative Pressurization.
The non-hazardous space and the air lock are to be maintained at over-pressure relative to the external hazardous area by independent mechanical ventilation systems arranged such that a single failure will not result in the simultaneous loss of over-pressure in both the non-hazardous space and the air lock. Failure of either ventilation system is to be alarmed at a manned control station.

5.5 Electrical Equipment (1 June 2020)
Spaces/areas housing the bow or stern loading/unloading manifold/cargo shore connection flange/valve connections are to be considered as Hazardous Area Zone 1. Electrical equipment, if installed in this space, is to be of the certified safe type, see 5C-1-7/31.9 of the Marine Vessel Rules for further guidance.

Where the oil spill containment and the loading or unloading connections are in open space, the area within 3 m (10 ft) from the oil spill containment boundary and the manifold is considered to be hazardous. This area is to be devoid of any source of ignition. Electrical equipment, if installed in this area, is to be of the certified safe type, see 5C-1-7/31.9 of the Marine Vessel Rules for further guidance.

7 Precautions for Ventilation of Accommodation and Machinery Spaces (1 June 2020)
The arrangement of ventilation inlets and outlets and other deckhouse and superstructure boundary space openings are to complement the provisions of 5C-1-7/11.1 of the Marine Vessel Rules as given below. Such vents, especially for machinery spaces, are to be situated as far aft as practicable. Special consideration is to be given to vessel designed to load or discharge at the stern.

The venting systems of cargo tanks are to be completely distinct from the vent pipes of the other compartments. The arrangements and position of openings in the cargo tank deck from which emission of flammable vapors can occur are to minimize the possibility of flammable vapors being admitted to enclosed spaces containing a source of ignition, or collecting in the vicinity of deck machinery and equipment which may constitute an ignition hazard.

9 Control and Monitoring Panels (1 June 2020)

9.1 Propulsion System Control Station
A control station for offshore loading/unloading may be arranged within the bow or stern area or on the navigation bridge. All operations during bow or stern loading/unloading for maintaining vessel position, monitoring relevant safety systems and monitoring of mooring and loading parameters are to be capable of being performed from the station. Where the control station is located on the navigation bridge, a secondary control and monitoring panel with the above functions are to be provided at or near the bow or stern loading work station.

The control station is to be provided with the following functions:

i) control of variable pitch, if fitted

ii) control of athwartship thrusters and azimuthal thrusters, if fitted

iii) emergency stop of main engine, or disengagement of clutch, if fitted

iv) control of steering gear

v) radar

vi) log

9.3 Instrumentation Panel for Mooring Arrangements
Bow or stern mooring instrumentation are to cover the following control systems:

i) mooring line tension
9.5 Cargo Loading Control Panel

Bow or stern loading instrumentation is to include the following:

i) indicator for loading connector coupling position  
ii) indicator for cargo valve position  
iii) indicator for cargo tank level and high level alarm  
iv) a system for automatic transfer of signals from the control and safety system, to enable automatic shutdown of cargo supply from the offshore terminal or transfer the control to the offshore terminal personnel to shutdown cargo supply taking control of cargo transfer pump(s), valve(s) etc.  
v) cargo pressure monitoring in the bow or stern loading line in way of the loading manifolds with high and low pressure alarms

11 Emergency Quick Release System (1 June 2020)

An emergency quick release system is to be provided for the cargo hose and mooring systems. The design, location and operation of this system should be to the satisfaction of ABS.

In case of an emergency, it should be possible to activate the automatic functions from the bridge/control station. The system is to be divided into two modes. Two classes of emergency shutdown (ESD) are to provided, Class 1 and Class 2 as listed below:

11.1 Class 1

Class 1 ESD is to automatically activate the following functions:

i) Start the hydraulic pump station  
ii) Trip the telemetry signal, which automatically trips the oil pumps and closes the export valve from the Offshore Loading Station  
iii) Closing the coupler valve  
iv) Close the inboard valve

All above activities should start simultaneously when Class 1 ESD is activated.

Note: Individual closing time for each of the above valves should be adjustable within range of 15-35 seconds. Closing time for coupling valve should be 25-28 Seconds. Closing of inboard valve should be a minimum 3 seconds longer. Total time for Class 1 ESD should be 28-35 Seconds.

11.2 Class 2

Class 2 ESD is to automatically activate the following functions:

i) Start the hydraulic pump station  
ii) Trip the telemetry signal, which automatically trips the oil pumps and closes the export valve from the Offshore Loading Station  
iii) Closing the coupler valve  
v) Close the inboard valve
v) Start the (water) spray system
vi) Opening the bow loading coupling claws
vii) Opening the chain stopper
viii) Releasing the brake and speed control of the traction winch where applicable

Activities 1 through 5 above should all start simultaneously when Class 2 ESD is activated.

Note: Total time for Class 2 ESD should be 38 (+/-2) Seconds. The manifold coupler claws should not open before the full water deluge is present during Class 2 ESD activation.

Detailed documentation on the sequential functions of all system components with specific timing of stopping/releasing etc. as per the system design is to be provided.

In case of hydraulic pump failure, hydraulic accumulators should provide hydraulic pressure. The time delay due to accumulator operation shall not exceed 7 seconds for full release of the hawser and the hose.

13 Communication (1 June 2020)

Means of main and emergency communications are to be provided internally (within the vessel between the cargo control room & bow/stern stations) and externally between the vessel cargo control room & bow/stern stations and offshore loading terminal. The communication equipment is to be certified safe for hazardous areas as needed.

15 Position Keeping Capabilities (1 June 2020)

The vessel is to be fitted with fixed pitch or controllable pitch propeller(s) or azimuthal thrusters & athwartship thrusters of sufficient power and redundancy for required maneuverability and position keeping capability of the vessel during offshore loading operations.

Alternatively, the vessel may be fitted with a dynamic positioning system which is to be at least equivalent to the ABS class notation DPS-1+ or higher in accordance with the requirements of the ABS Guide for Dynamic Positioning Systems.

17 Mooring Arrangements (1 June 2020)

If fitted with single point mooring arrangements, the installation is to be in accordance with the requirements of 3-5-2/7 of the Marine Vessel Rules.

Mooring chain, thimble, shackles, loading hose termination coupling, etc. is to be protected against contact with steel structure elements, via use of hardwood or an equivalent material.

19 Additional Provisions for Safety and Fire Protection (1 June 2020)

The bow or stern loading/unloading area is to be provided with the following arrangements, equipment and subsystems:

i) An additional water spray and foam combination system is to be provided covering the bow or stern loading/unloading and mooring area.

ii) An automatic water spray system is to be provided to prevent potential sparking from equipment such as the bow loading coupling, wire rollers, mooring chain, fairlead, chain stopper, winches and the exterior of manned control stations, if fitted. The system is to be able to be activated both locally from the bow or stern loading/unloading control station and automatically in case of emergency. The system is to be pressurized during the bow/stern loading operation and is to be independent of the vessel's firemain system and should be able to discharge 6.1 liters/m2/minute (0.15 gpm/ft²).

iii) An independent foam-based spray system is to be provided for the bow or stern loading/unloading connection room with a foam solution supply rate not less than 6 liters/min/m² (15 gal/min/ft²) for...
5 minutes. The system is to be independent from the vessel's main foam system (i.e. foam tank and pump) but the system can be connected to the system serving the bow loading foam monitor and the water-based sprinkler system. The system is to be capable of being activated from both locally and from the bow or stern loading/unloading control station.

**iv)** When mechanical ventilation for the manned control station is provided, necessary precaution is to be taken against ingress of hydrocarbon gas.

**v)** Adequate natural ventilation is to be provided in the bow or stern loading/unloading connection room so that sufficient air circulation is achieved during operation. Additional ventilation openings are to be provided for the space where needed.

**vi)** An emergency escape route is to be provided from the manned control station and bow or stern loading/unloading connection room.

**vii)** The manned control station boundaries are to provide adequate protection from fire and be insulated to A-60 standard to provide adequate protection from Fire.

**viii)** An interlock is to be provided to avoid malfunction of the offshore mooring and loading/unloading system.

**ix)** A fixed hydrocarbon gas and fire detection and alarm system is to be provided in the bow or stern loading/unloading connection room in accordance with 5C-1-7/17.1.4 and 4-7-3/11 of the ABS Marine Vessels Rules. Alarms are to be activated both locally and at the bow or stern loading control station.

**x)** Adequate lighting (a minimum of 200 lumens) is to be provided at all times in the bow or stern loading/unloading area and mooring winch deck to provide good visibility for safe working conditions.

**xi)** To avoid possible spray/mist due to liquid leakage, the electrical equipment associated with bow loading system should be installed in a separate room and the room should be classified as safe area.

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**21 Operation Manual (1 June 2020)**

The operation manual is to be provided which includes details of the bow or stern loading/unloading procedures, system descriptions with schematic diagrams, emergency procedures such as an activation of emergency quick release system and precautions in case of high tension in the mooring system, and actions which are essential for the safe use of equipment while the ship is engaged in loading/unloading. The following details of each system along with appropriate drawings/schematics are to be included in the manual.

**i)** Cargo tank arrangement plans, cargo transfer system, mooring arrangement, communication system, instrumentation, ventilation equipment.

**ii)** Details of emergency disconnection quick release system,

**iii)** Details including location of fire detection and extinguishing equipment, emergency escape routes,

**iv)** Description of mooring procedures and, connection and disconnection of cargo hose coupling,

**v)** Procedures for engaging and disengaging chain stopper

**vi)** Procedures for operation of bow door

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**23 Trials and Testing (1 June 2020)**

The arrangements and equipment related to the bow or stern loading/unloading are to be functionally tested and examined upon installation. The cargo piping is to be hydrostatically tested to 1.5 times the maximum working pressure (MWP). The functional test of a bow or stern loading/unloading system is to include
connection of a dummy bow loading hose to the bow loading coupling. The calibration of the load cells for tension monitoring in the bow or stern loading/unloading system is to be verified by the Surveyor.

25 **Surveys (1 June 2020)**

When an oil carrier with bow or stern loading/unloading arrangements seeks the BLU or SLU notation, the initial surveys are to be carried out as per Section 2/23 of this Guide.

Surveys after construction for oil carriers with bow or stern loading/unloading (BLU or SLU) are to be in accordance with 7-6-2/1.3.4, "Survey After Construction" of the ABS *Marine Vessel Rules.*
SECTION 3 Liquefied Gas Carriers

1 General

The bow or stern loading and unloading arrangements for a Liquefied Gas Carrier are to comply with requirements of 5C-8-3/8 and 5C-8-5/10.1 of the Marine Vessel Rules. The requirements are repeated below for ready reference.

1.1 Bow or stern loading and unloading lines which are led past accommodation spaces, service spaces or control stations are not to be used for the transfer of products requiring a type 1G ship.

Bow or stern loading and unloading lines are not to be used for the transfer of toxic products as specified in 5C-8-1/2.53 of the Marine Vessel Rules unless specifically approved by ABS.

1.3 Entrances, air inlets and openings to accommodation spaces, service spaces, machinery spaces and control stations are not to face the cargo shore connection location of bow or stern loading and unloading arrangements. They are to be located on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the vessel, but not less than 3 m (10 ft) from the end of the superstructure or deckhouse facing the cargo shore connection location of the bow or stern loading and unloading arrangements. This distance, however, need not exceed 5 m (16.4 ft). Sidescuttles facing the shore connection location and on the sides of the superstructure or deckhouse within the distance mentioned above are to be of the fixed (non-opening) type. In addition, during the use of the bow or stern loading and unloading arrangements, all doors, ports and other openings on the corresponding superstructure of deckhouse side are to be kept closed. Where in the case of small vessels, compliance with 5C-8-3/2.4.1 through 5C-8-3/2.4.3 of the Marine Vessel Rules and this paragraph is not possible, ABS may approve relaxations from the above requirements.

1.5 Deck openings and air inlets to spaces within distances of 10 m (32.8 ft) from the cargo shore connection location are to be kept closed during the use of bow or stern loading or unloading arrangements.

1.7 Portable arrangements are not permitted.

3 Cargo Piping System

In addition to the requirements of Section 5C-8-5 of the Marine Vessel Rules, the following provisions apply to cargo piping and related piping equipment.

3.1 Cargo piping and related piping equipment outside the cargo area are to have only welded connections. The piping outside the cargo area is to run on the open deck and is to be at least 760 mm (30 in.) inboard, except for athwartships shore connection piping. Such piping is to be clearly identified and fitted with a shutoff valve at its connection to the cargo piping system within the cargo area. At this location, it is also be capable of being separated by means of a removable spool piece and blank flanges when not in use.
3.3

The piping is to be full penetration butt welded and fully radiographed, regardless of pipe diameter and design temperature. Flange connections in the piping are only permitted within the cargo area and at the shore connection.

3.5

Arrangements are to be made to allow such piping to be purged and gas-freed after use. When not in use, the spool pieces are to be removed and the pipe ends be blank-flanged. The vent pipes connected with the purge are to be located in the cargo area.

5  Hazardous Areas and Electrical Systems

Electrical equipment within a zone of 3 m (10 ft) from the cargo shore connection location is to be in accordance with Section 5C-8-10 of the *Marine Vessel Rules*.

7  Communication System

Means of communication between the cargo control station and the shore connection location are to be provided and if necessary certified safe.

9  Fire Extinguishing Arrangements

On vessels carrying flammable or toxic products or both, a water spray system for cooling, fire prevention and crew protection is to be installed to cover the cargo liquid and vapor discharge and loading manifolds and the area of their control valves and any other areas where essential control valves are situated and which is to be at least equal to the area of the drip trays provided.

Vessels fitted with bow or stern loading and discharge arrangements are to be provided with an additional dry chemical powder unit complete with at least one monitor and one hand hose line complying with the requirements of 5C-8-11/4.1 to 5C-8-11/4.5 of the *Marine Vessel Rules*. This additional unit is to be located to protect the bow or stern loading and discharge arrangements. The area of the cargo line forward or aft of the cargo area is to be protected by hand hose lines.
SECTION 4 Chemical Carriers

1 General

The bow or stern loading and unloading arrangements for a Chemical Carrier are to comply with requirements of 5C-9-3/7 of the Marine Vessel Rules. The requirements are repeated below for ready reference.

1.1 Bow or stern loading and unloading lines are not to be used for the transfer of products required to be carried in type 1 ships.

Bow and stern loading and unloading lines are not to be used for the transfer of cargoes emitting toxic vapors required to comply with 5C-9-15/12.1 of the Marine Vessel Rules unless specifically approved by ABS.

1.3 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations are not to face the cargo shore connection location of bow or stern loading and unloading arrangements. They are to be located on the outboard side of the superstructure or deckhouse at a distance of at least 4% of the length of the vessel, but not less than 3 m (10 ft) from the end of the house facing the cargo shore connection location of the bow or stern loading and unloading arrangements. This distance, however, need not exceed 5 m (16.4 ft). Sidescuttles facing the shore connection location and on the sides of the superstructure or deckhouse within the distance mentioned above are to be of the fixed (non-opening) type. In addition, during the use of the bow or stern loading and unloading arrangements, all doors, ports and other openings on the corresponding superstructure or deckhouse side are to be kept closed. Where, in the case of small vessels, compliance with 5C-9-3/2.3 of the Marine Vessel Rules and this paragraph is not possible, ABS may approve relaxations from the above requirements.

1.5 Air pipes and other openings to enclosed spaces not listed in 5C-9-3/7.4 of the Marine Vessel Rules are to be shielded from any spray which may come from a burst hose or connection.

1.7 Portable arrangements are not permitted.

1.9 Escape routes are not to terminate within the coamings required by 4/3.13 below or within a distance of 3 m (10 ft) beyond the coamings.

3 Cargo Piping System

In addition to 5C-9-5/1 of the Marine Vessel Rules, the following provisions apply.

3.1 The piping outside the cargo area is to be fitted at least 760 mm (30 in.) inboard on the open deck. Such piping is to be clearly identified and fitted with a shutoff valve at its connection to the cargo piping system.
within the cargo area. At this location, it is to also be capable of being separated by means of a removable spool piece and blank flanges when not in use.

3.3

The shore connection is to be fitted with a shutoff valve and a blank flange.

3.5

The piping is to be full penetration butt welded and fully radiographed. Flange connections in the piping are only permitted within the cargo area and at the shore connection.

3.7

Spray shields are to be provided at the connections specified in 4/3.1, as well as collecting trays of sufficient capacity with means for the disposal of drainage.

3.9

The piping is to be self-draining to the cargo area and preferably into a cargo tank. Alternative arrangements for draining the piping may be accepted by ABS.

3.11

Arrangements are to be made to allow such piping to be purged after use and maintained gas-safe when not in use. The vent pipes connected with the purge are to be located in the cargo area. The relevant connections to the piping are to be provided with a shutoff valve and blank flange.

3.13

Continuous coamings of suitable height are to be fitted to keep any spills on deck and away from the accommodation and service areas.

Note: The expression “suitable height” means the height of coaming to be of approximately 150 mm (6 in.), however nowhere less than 50 mm (2 in.) above upper edge of sheer strake.

5 Hazardous Areas and Electrical Systems

Electrical equipment within the coamings required by 4/3.13 or within a distance of 3 m (10 ft) beyond the coamings is to be in accordance with the requirements of Section 5C-9-10 of the Marine Vessel Rules.

7 Communication and Remote Shutdown Systems

Means of communication between the cargo control station and the cargo shore connection location are to be provided and certified safe, if necessary. Provision is to be made for the remote shutdown or cargo pumps from the cargo shore connection location.

9 Fire Extinguishing Arrangements

Vessels fitted with bow or stern loading and unloading arrangements are to be provided with one additional foam monitor meeting the requirements of 5C-9-11/3.7 of the Marine Vessel Rules and one additional applicator meeting the requirements of 5C-9-11/3.10 of the Marine Vessel Rule. The additional monitor is to be located to protect the bow or stern loading and unloading arrangements. The area of the cargo line forward or aft of the cargo area is to be protected by the above-mentioned applicator.