GUIDANCE NOTES
GD03-2017

CHINA CLASSIFICATION SOCIETY

GUIDELINES FOR SURVEY OF OIL FLOATING STORAGE VESSELS FIXED AT ANCHORAGE

2017

Effective from 1 March 2017

BEIJING

Contents

Chapter 1 GENERAL

1.1 Application

1.1.1 The Guidelines apply to classification surveys of oil floating storage vessels (FSV) satisfying the following conditions:

(1) a laid-up double hull oil tanker, of which the cargo tanks and relevant systems have oil storage function;

(2) a fixed anchorage in restricted marine environment with an offshore distance not exceeding 20 nautical miles.

1.1.2 The Guidelines do not apply to newly built oil floating storage units or vessels.

1.1.3 For those not covered in the Guidelines, the requirements of the Rules for Classification of Sea-Going Steel Ships of China Classification Society (hereinafter referred to as 'CCS') are to be complied with.

1.2 Class notations

1.2.1 The following type notation is to be assigned to an oil FSV to which the Guidelines apply and the position of anchorage is to be added:

Oil FSV fixed at XXX Anchorage（Oil Floating Storage Vessel fixed at XXX Anchorage）

1.3 Plans and documents

1.3.1 The following plans and documents are to be submitted to CCS for approval:

(1) mooring arrangements plan showing mooring patterns, mooring fittings and equipment;

(2) details of mooring fittings and equipment, showing foundation and connection system for STS transfer;

(3) oil delivery electrical system;

(4) emergency evacuation plan.

1.3.2 The following plans and documents are to be submitted to CCS for reference:

(1) environmental information on wind, wave and current at anchorage.

1.3.3 The plans and documents of an initially classed oil FSV are to be checked in accordance with the requirements for transfer of class of double hull oil tankers in Section 14, Chapter 5 of PART ONE of CCS Rules for Classification of Sea-Going Steel Ships.

1.3.4 For special structures and arrangements, additional plans and information may be required, if considered necessary by CCS.

1.4 Statutory requirements

1.4.1 In addition to the requirements of the Guidelines, an oil FSV is also to comply with relevant requirements of the Administration (flag State/ coastal State). CCS carries out statutory surveys within the scope of authorization.

Chapter 2 SURVEY AND CERTIFICATION

2.1 Surveys

2.1.1 In addition to the following requirements for surveys of the outside of the ship's bottom, various surveys of an oil FSV fixed at anchorage are to be conducted in accordance with relevant applicable requirements for oil tankers in CCS Rules for Classification of Sea-Going Steel Ships.

2.1.2 Examinations of the outside of the ship's bottom and related items of ships may be carried out with the ship in dry dock or on a slipway, or while the ship is afloat. The examinations in dry dock or on a slipway are considered as docking surveys and the examinations with the ship afloat as in-water surveys.

2.1.3 Examinations of the outside of the ship's bottom and related items of ships are normally to be carried out with the ship in dry dock. However, for an oil FSV of 15 years of age or less, consideration may be given to replacing docking surveys with in-water surveys. For an oil FSV of more than 15 years of age, CCS will give special consideration to deciding whether to accept the application for replacing docking surveys with in-water surveys submitted by the owner, taking into account the detailed situation and condition of last survey of the oil FSV.

2.2 Issuance and endorsement of certificates

2.2.1 A classification certificate with Oil FSV class notation is issued by CCS to an oil FSV complying with the requirements of the Guidelines. In case of any change to the working environment of the oil FSV, the application unit is to submit all the information specified in 1.3 of the Guidelines to CCS for review so as to maintain the validity of the certificate.

2.2.2 The CCS class assigned to an oil FSV which is found to comply with the Guidelines upon satisfactory surveys after construction in accordance with CCS Rules for Classification of Sea-Going Steel Ships will continue to be valid, and CCS will issue or renew the classification certificate with OIL-FSV class notation.

Chapter 3 TECHNICAL REQUIREMENTS

3.1 Class requirements

3.1.1 Hull

3.1.1.1 The intact stability of an oil FSV is to comply with relevant requirements of Chapter 2 and 3.2 of Chapter 3 of International Code on Intact Stability, 2008 (2008 IS Code). For the purpose of calculation, it is to be assumed that the vessel is floating free of mooring restraints. However, the possible detrimental effects of mooring restraints on stability are to be considered.

3.1.1.2 The damage stability of an oil FSV is to comply with the requirements of regulation 28 of MARPOL 73/78 Annex I. The calculation of damage stability is to be carried out for the most critical anticipated service condition and it is to be assumed that the vessel is floating free of mooring restraints. However, the possible detrimental effects of mooring restraints on stability are to be considered.

3.1.1.3 The minimum freeboard, load line marks of an oil FSV are to comply with relevant requirements of Annex I to International Convention on Load Lines, 1966. The load line marks of an oil FSV are to be visible to the person in charge of mooring or otherwise operating the oil FSV.

3.1.1.4 The oil FSV is to be provided with loading guidance information containing sufficient information to guide the oil FSV to carry out loading, transportation, ballasting and load adjustment for the purposes of possible inspection and repair at sea and maintain the oil FSV within the stipulated operational limitations. The loading guidance information is to include an approved Loading Manual and Loading Computer System.

3.1.1.5 The hull structure of an oil FSV is to comply with the requirements of Chapter 5, PART TWO of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.2 Equipment and outfits

3.1.2.1 The anchoring equipment of an oil FSV is to comply with relevant requirements of Section 2, Chapter 3 of PART TWO of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.2.2 Emergency towing arrangements of an oil FSV are to comply with relevant requirements of Section 5, Chapter 3 of PART TWO of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.2.3 Where single point mooring arrangements are fitted, standards (such as international industry standards and relevant requirements of oil companies) accepted by CCS are to be complied with.

3.1.3 Machinery installations

3.1.3.1 The piping system of an oil FSV is to comply with relevant requirements of Chapter 5 of PART THREE of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.3.2 Fire safety measures of an oil FSV are to comply with relevant requirements of Chapter 3 of PART SIX of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.3.3 The inert gas system of an oil FSV is to comply with relevant requirements of Chapter 4 of PART SIX of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.4 Electrical installations

3.1.4.1 In addition to the following requirements, the electrical installations of an oil FSV are also to comply with relevant requirements of PART FOUR of CCS Rules for Classification of Sea-Going Steel Ships.

3.1.4.2 The environmental conditions of electrical installations are to comply with the requirements of 1.2.1.1 of Chapter 1, PART FOUR of CCS Rules for Classification of Sea-Going

Steel Ships. Special consideration will be given by CCS to the operating environment conditions of electrical equipment which permanently works at the same fixed waters.

3.1.4.3 Grounding set to prevent inflammable oil tanks and pipeline from dangerous effect of static electricity is to comply with the following requirements:

(1) Reliable electrical connection is to be set at every connector and at least two points of earthing of oil transmission pipelines and equipment on the oil FSV fixed at anchorage.

(2) Metal conductor must be used every 20 m to connect and earth the pipelines laid in parallel on the oil FSV fixed at anchorage when the distance is less than 100 mm; Metal conductor must also be used to connect and earth the pipelines when the crossing distance is less than 100 mm.

(3) Reliable earthing is to be set for the head, end and branch piping of oil piping.

(4) Anti-static earthing device across with transfer tanker is to be set for the oil FSV fixed at anchorage. 35 mm^2 multistrand copper core cable is to be used to connect to ensure equipotential connection under oil transmission.

(5) Continuous electrical connection is to be kept between the oil FSV fixed at anchorage and hose, among hoses and between hose and transfer tanker.

3.2 STS (ship-to-ship transfer)

3.2.1 Transfer systems

3.2.1.1 Enough distance is to be left between the transfer system and the accommodation module, the air inlet, as well as the key safety equipment. Special consideration is to be given to the protection of the key safety equipment in case of collision between the transfer ship and the oil FSV.

3.2.2 Equipment

3.2.2.1 Equipment such as fairleads, mooring bitts and mooring lines used during ship-to-ship transfer of the oil FSV are to comply with the standards (such as international industry standards and relevant requirements of oil companies) accepted by CCS.

3.2.3 Safety and environmental protection in STS operation

3.2.3.1 In order to ensure the safety and to prevent environmental pollution in STS operation, the potential risks that may be encountered during the STS operation are to be comprehensively analyzed, and an operational procedure is to be developed with risk reduction measures. This procedure is to include at least the following:

(1) Meteorological and sea condition restrictions in STS operations;

(2) Mooring calculations during alongside transfer or tandem transfer of refueling ship in STS operations;

(3) Required technical conditions of the systems related to the STS operation (e.g. inert gas, ballast, nitrogen purging, firefighting systems, etc.);

(4) Assignment of duty and scope of responsibility of various personnel involved in the STS operation;

(5) Automatic and emergency release procedures.

3.2.3.2 Bunds are to be provided for collection of possible leakage from loading hose end-connections and offloading manifold. The height of bunds must take operational movements of the ship into account.

3.2.4 Cargo transfer hoses

3.2.4.1 Hoses are to be designed and manufactured according to the recognized standards. Guide

to Manufacturing and Purchasing Hoses for Offshore Moorings of Oil Companies International Marine Forum (OCIMF) may be taken as one of the recognized standards. If hoses are supplied by an STS service provider, the master, shipping company or organizer is to determine the age/age limit of the hose to be used and take appropriate measures to ensure the fender complies with the requirements of the intended service. The certificate of hose is to be provided by STS service provider.

3.2.4.2 The hose is to be tended by the cargo hose derrick or a gantry arrangement.

3.2.4.3 It is recommended that an over-the-rail type hose be used for a horizontal hose/manifold connection where the hose end has to bend over the side of the vessel.

3.2.4.4 Means are to be provided to prevent solidification and wax deposition of crude oil in the hose where the ambient temperature is lower than the pour point of crude oil or the crude oil has high wax content.

3.2.4.5 Means for flushing the hoses are to be provided.

3.2.4.6 Electrically conductive connection between the oil FSV and the hose is to be maintained continuously, and non-electrically conductive connection is to be used between the hose and the transfer tanker.

3.2.4.7 The hose is to be fitted with fail safe isolation valve(s) that will close off flow automatically if the hose is disconnected or broken.

3.2.4.8 The design parameters (e.g. flow rate, pressure, minimum allowable bending radius) and operation environmental limits of the hose are to be permanently and clearly marked on the hose.

3.2.4.9 The hose is to be fitted with a weak connector, the design of which has been proven, to minimize the spillage of cargo oil into the sea in case of a controlled or uncontrolled accidental disconnection between the oil FSV and transfer tanker.

3.2.4.10 A special position for storage of hoses is to be provided on the oil FSV (if the oil FSV is provided with hoses) and hose protective measures are to be added so as to prevent mechanical damage and humidity hazard to hoses.

3.2.5 Offloading control, monitoring and release system

3.2.5.1 General requirements

(1) The system is to have instrumentation enabling continuous measurement of the following parameters:

Offloading pressure;

Status of hose and hawser connection;

Tension in connection equipment (e.g. hose winch);

Tension in hawser.

(2) The control system is to have all necessary interlock functions as necessary to avoid spillage or other maloperations of the offloading system, (e.g. trip of system if hose connection is broken or start of oil export pump prior to connection of offloading hose will not be possible).

(3) The offloading control station is to, as a minimum, have two independent systems for communication with other related control stations and oil receiving tanker.

3.2.5.2 Offloading control station

(1) There is to be a control station for remote operation and monitoring of the offloading operation. This is to have direct view or indirect monitoring, e.g. by CCTV, of relevant marine systems.

(2) CCTV cameras are to be of adequate quality with necessary manipulation functions available. Wiper and cleaning functions are also to be implemented.

(3) The control station is to have the following functions:

Control and monitoring of operations;

Shutdown of offloading operations;

Remote/ local emergency release of hawser connections located on the oil FSV fixed at anchorage;

Remote/local emergency release of the hose connection located on the oil FSV fixed at anchorage.

3.2.5.3 Release

(1) Release includes automatic (normal) release and emergency (manual) release.

(2) The automatic release system is to be fail-safe. The emergency release system is to be independent of the automatic system.

(3) Normal and emergency release are not to result in oil leakage, create ignition sources, or any other form of overloading or damage to the oil FSV fixed at anchorage.

(4) The system details of the offloading system are to be declared in a protection philosophy document declaring the mooring line and hose release systems in respect of normal operation and emergency release. The philosophy is to include a system diagram, showing all instruments, safety devices, interlocks and telemetry devices. The design limitations of the system are to be clearly stated and at least include flow rates, design pressure, temperatures, minimum hose bending radius, breaking loads as well as operational weather limitations.

(5) The design load for the mooring line emergency release system and its foundation is at least to be the minimum breaking strength of the mooring line. The maximum stress in the release system is not to exceed the yield stress or 80% of the minimum breaking stress, whichever is lower.

3.2.6 Lighting

3.2.6.1 When the STS operation is carried out at night, the lighting in the deck working area is to comply with the relevant requirements of standards accepted by CCS (e.g. Ship to Ship Transfer Guide (Petroleum) of Oil Companies International Marine Forum (OCIMF)).

3.2.7 Use of radio and satellite communications

3.2.7.1 During the STS operation, the use of radio and satellite communications is to comply with the relevant requirements of standards accepted by CCS (e.g. Ship to Ship Transfer Guide (Petroleum) of Oil Companies International Marine Forum (OCIMF)).