Title	MSC Circulars / MSC/Circ.737

GUIDELINES ON ANCHORING SYSTEMS FOR MODUs

1 The Maritime Safety Committee, at its sixty-sixth session (28 May to 6 June 1996), having noted the provisions of section 4.11 of the 1989 MODU Code, approved the Guidelines on anchoring systems for MODUs prepared by the Sub-Committee on Ship Design and Equipment, as set out in the annex, and agreed that the Guidelines should be referred to in the footnote to section 4.11 of the Code.

2 Member Governments are invited to bring the Guidelines to the attention of bodies concerned for application as appropriate.

ANNEX

PREAMBLE

Reference is made to the Preamble of 1989 MODU Code.

1 Application

1.1 These guidelines supplement Section 4.11 of the 1989 MODU Code.

1.2 When an assessment of a MODU's anchoring performance according to the 1989 IMO MODU Code is required, these guidelines may be applied for units whose primary method of position keeping is provided by a spread catenary anchoring system.

1.3 These guidelines may also be used for mobile offshore units (MOUs) other than MODUs, e.g., accommodation units, tender vessels, crane barges, etc.

2 General principles

2.1 The design of a spread catenary anchoring system should be based upon the unit's operating requirements in relation to the design specification of the anchoring system, the system capability/operability, integrity and reliability. There should also be means of relating the design limitations to the proposed locations and site specific environmental conditions.

2.2 Anchoring analysis should be developed in parallel with such operational practices (e.g. line adjustment, and use of propulsion) as are achievable in a timely manner and which are intended to be used in practice.

3 Anchoring analysis

3.1 Anchoring analysis should be conducted to demonstrate that the unit can, either at proposed locations and site specific conditions or generally, withstand:

.1 acceptable environmental conditions during operation; and

.2 maximum design environmental conditions.

The anchoring analysis should also cover the effect of single line failures.

3.2 The maximum design environmental condition used in the analysis should be determined on the basis of a risk analysis considering both the local environmental conditions (either site specific or generally for the area) and the consequences of anchoring failure. In areas of tropical cyclone the maximum environment used in the analysis may be lower than the actual extreme environment, provided that evacuation of personnel or move of the unit is planned and will be executed before arrival of the tropical cyclone.

3.3 Factors of safety and other such criteria should be determined using appropriate codes and practices relevant to the design specification, the location of the unit and the hazard consequences of an anchoring failure. Applicable criteria may be found in coastal State, flag State, classification society publications and/or ISO Floating System Standard.

3.4 The anchoring analysis employed should be fully compatible with the operational requirements, e.g. riser analysis, riser angle limits for hanging off, disconnecting, loading and unloading of hydrocarbons, or gangway connection.

4 Anchoring failure/risk evaluation

4.1 Anchoring failure can be considered as any situation arising outside of the design specification, e.g. excessive excursion as a result of insufficient tension, single line failure and progressive line failure leading to total system failure.

4.2 Hazards associated with anchoring failure should be identified, risk evaluated and measures taken to reduce the risk to persons affected by those hazards to the lowest level that is reasonably practicable.

4.3 Typical consequences which may result from the anchoring hazards could include:

.1 collision;

.2 riser, BOP or wellhead problems;

.3 structural damage;

.4 grounding; and

.5 reduced stability, etc.

4.4 In determining anchoring failure consequences, consideration should be given to all foreseeable hazards, including, but not limited to:

.1 failure of the emergency release mechanism, premature or delayed release;

.2 failure of structures supporting anchoring equipment, fairleads, winches, etc.;

.3 manufacturing defects including material and manufacturing processes;

.4 mechanical, electrical and hydraulic equipment failures, etc.;

.5 overloading the anchor holding capacities;

.6 in-service degradation due to corrosion, abrasion deployment retrieval, etc.;

.7 inadequate operating procedures, maintaining procedures handling procedures, etc.;

.8 exceeding the capacity of the system to perform its function; and

.9 operator error.

Note: Whilst such failures need to be recognised as possibilities in risk assessment, measures should be adopted to prevent them wherever possible.

5 Anchoring Components

Specifications of the anchoring components such as anchor, chain, wire rope, connection link buoys, winches and monitoring equipment should be in accordance with those assumed or required by the anchoring analysis and should comply with the IMO 1989 MODU Code, Section 4.11. Attention should be given to the ability of the chain to tolerate the heavy bending it suffers in winch and fairlead.

6 Surveys and inspections

An inspection/maintenance system should be established. All components in the system are to be periodically inspected and maintained taking into consideration the manner in which components may deteriorate (e.g. through wear and fatigue), the capability of the inspection method, and the implications for component and system performance.

7 Operating procedures

7.1 Operating procedures should be developed, on a site specific basis if necessary, which include criteria for the safe operation of the system having regard to the activities in which the unit is engaged (e.g. criteria for gangway or marine riser disconnection).

7.2 The assumptions made in the anchoring analysis and the conclusions of the analysis should be reflected by the manner in which the actual anchoring system is set up and maintained. In order to achieve this aim, any conclusions or limitations derived from the anchoring analysis should be described in terms of procedures which can be successfully followed offshore.

7.3 Operational procedures for reducing anchoring line tensions such as active winching, or using thrusters to redistribute tension loads should be clearly defined with written procedures onboard. Personnel likely to be involved with these practices should be competent, adequately trained, and aware of their roles.

7.4 Any extension of working limits on implementing operational procedures should be clearly defined, with adequate justification.