

## **Draft Regulations concerning towing arrangement and transit of mobile offshore units**

Laid down by the Norwegian Maritime Authority on ddmmyyyy under the Act of 16 February 2007 No. 9 relating to Ship Safety and Security (Ship Safety and Security Act) sections 6, 9, 11, 13, 14, 15 and 21, cf. Formal Delegation of 16 February 2007 No. 171 and Formal Delegation of 31 May 2007 No. 590 by the Ministry of Trade and Industry..

**EEA references:** EEA Agreement Annex II chapter XIX point. 1 (Directive 98/34/EC)

### **Chapter 1. Scope of application**

#### *Section 1 Scope of application*

These Regulations apply to Norwegian mobile offshore units.

### **Chapter 2. Self propulsion and towing force**

#### *Section 2 Necessary forces during transit*

(1) A mobile offshore unit shall have sufficient force either by self propulsion, combined self propulsion and towing force or only towing force to keep the unit in a fixed position during the following environmental conditions:

- a) 20 m/s wind;
- b) 1 m/s current;
- c) a significant wave height of 5 m ( $H_s$ );
- d) zero up-crossing wave period ( $T_z$ ) between 6 and 9 seconds.

(2) During transit in territorial waters, the unit shall under similar environmental conditions as in the first paragraph be able to:

- a) maintain a minimum speed of 2 knots;
- b) be kept in a fixed position if there are errors in any part of the propulsion system.

### **Chapter 3. Towing arrangement**

#### *§ 3 Types of towing arrangements*

(1) Mobile offshore units shall be provided with

- a) a main towing arrangement;
- b) an emergency towing arrangement;
- c) a narrow water towing arrangement.

(2) Omission of the main towing arrangement is accepted when the mobile offshore unit is certified for independent navigation and by self propulsion complies with the requirements of section 2.

#### *Section 4 Main towing system*

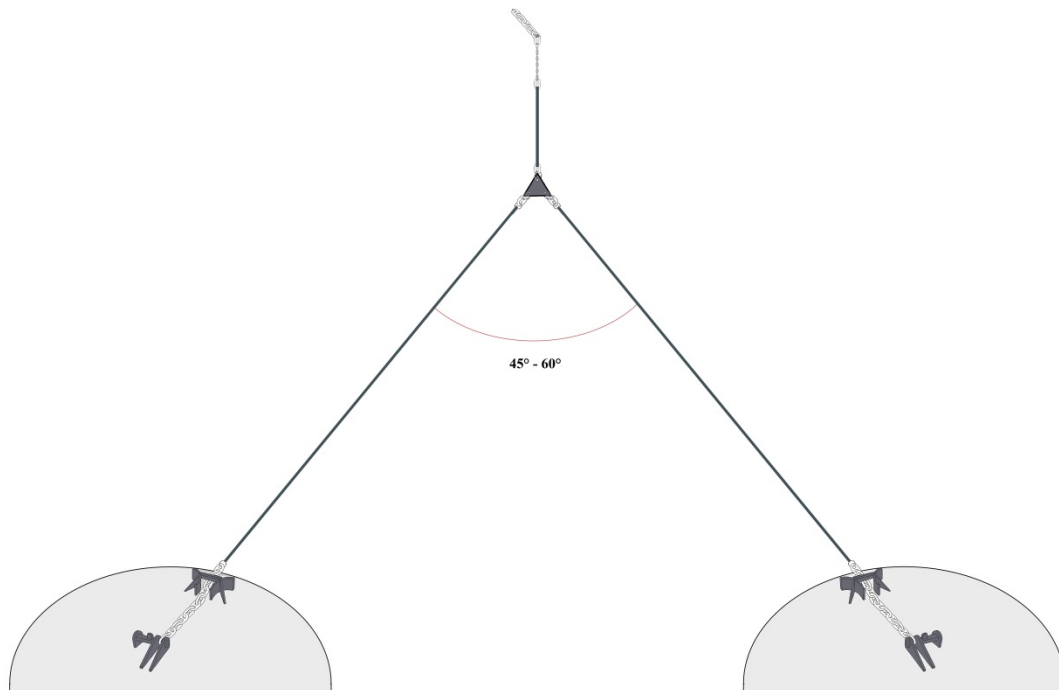
(1) A main towing arrangement shall consist of

- a) at least two attachments to the unit sufficiently spaced to have control during the towing operation;
- b) towing connection(s);
- c) one weak link per towing connection, with a suitable chain in the end to place in the shark-jaw of the towing vessel;
- d) shackles for connections

(2) The following spare material shall be on board during the towing operation:

- a) a complete towing connection;
- b) two weak links including shackles for the mounting arrangement.

(3) If one towing vessel is used, a bridle with a flounder plate shall be used. The upper angle of the bridle shall be between  $45^\circ$  and  $60^\circ$ , as illustrated below:



#### *Section 5 Emergency towing arrangement*

(1) An emergency towing arrangement shall consist of

- a) a towing connection with a suitable chain in the end to place in the shark-jaw of the towing vessel;
- b) shackles for connections.

(2) An emergency towing arrangement shall be arranged for two towing vessels. For mobile offshore units with a ship's hull, emergency towing arrangements may be arranged for one towing vessel.

(3) It shall be possible to hook the emergency towing connection to the towing vessel after loss of main and emergency power.

(4) The unit's anchor lines may be used to establish an emergency towing connection when the anchor arrangement

- a) complies with the requirements of the first to third paragraphs and sections 7 and 8;
- b) can at any time be attached to a towing vessel in a safe manner.

#### *Section 6 Emergency anchor*

(1) Mobile offshore units without sufficient propulsion power shall during transit have an anchor arrangement ready for emergency anchoring.

(2) The anchor arrangement shall be capable of keeping the unit in a fixed position during the worst environmental conditions that may occur during the towing operation.

(3) All components in the anchor arrangement shall be certified by an MOU classification society with which the Ministry has entered into an agreement.

(4) After loss of supply of power, it shall be possible to perform a controlled drop of the emergency anchor.

## Chapter 4. Construction and dimensioning of the main and emergency towing arrangement

### Section 7 Construction of the towing arrangement

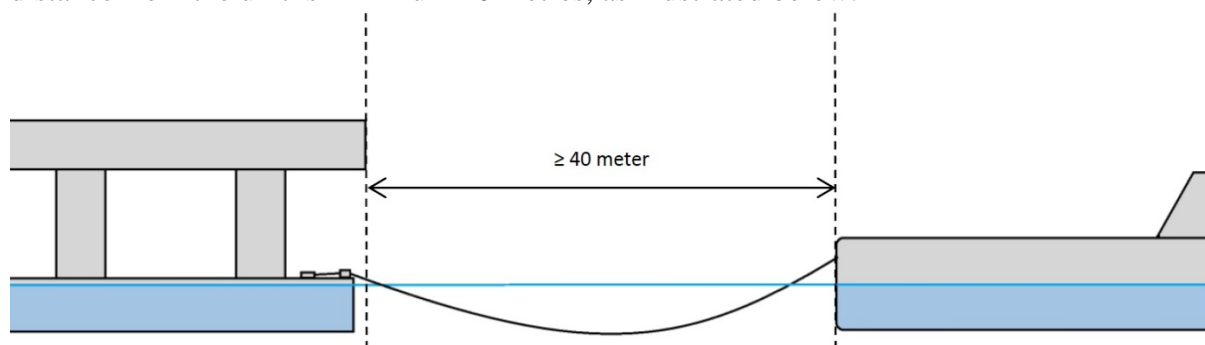
The tow connection shall consist of a chain or a combination of chain and wire. Where the tow connection is subject to heavy wear and tear, a chain shall be used.

(2) Wire ropes in towing connections shall be fitted with terminations, with solid thimbles or steel socket, suitable for towing operations.

(3) The position, construction and arrangement of the attachments shall be such that it is reasonably easy and quick to change the towing equipment in calm waters.

(4) Equipment which is part of the towing arrangement shall have a factory (test) certificate from the manufacturer.

(5) The tow connection shall have sufficient length for connection where the towing vessel's distance from the unit is minimum 40 metres, as illustrated below:



### Section 8 Dimensioning of towing arrangement

(1) The towing design load ( $F_D$ ) for the towing arrangement shall at least be equal to the requirements for towing force pursuant to section 2.

(2) The propulsion power of a mobile offshore unit shall not be included in the dimensioning of the emergency towing arrangement.

(3) The towing equipment shall have a breaking load of at least three times  $F_D$ .

(4) The weak link shall have a breaking load between two times  $F_D$  and the breaking load of the towing equipment.

(5) Triplates shall be dimensioned to ensure that the yield point is not exceeded when subjected to a load equal to the breaking load of the towing equipment.

(6) The shackles for connection shall have a breaking strength that exceeds the breaking strength of the strongest part of the tow connection.

(7) Towing attachments, hawseholes, etc. shall be dimensioned with a utilization factor of 0.9, and associated supporting structure with a factor of 0.8, against the material's limit of yield strength in relation to the breaking load pursuant to the third paragraph. Strength analyses shall be made for the most unfavourable direction of the towing line's strength.

### Section 9 Additional requirements for the main towing arrangement

(1) A weak link shall be placed at the end of the towing equipment.

(2) In the event of a break in the main towing arrangement, it shall be possible to quickly establish a new tow connection in a safe manner.

(3) The retrieving arrangement shall be dimensioned to retrieve the combined load of the unit's towing equipment and the length of the towing line to be used. Maximum distance

between the unit and the towing vessel, and maximum ocean depths during towing operations, shall be included in the dimensioning.

## Chapter 5. Planned transit

### Section 10 Requirements for transit

Transit moves shall take place in such a way that it causes the least possible encumbrance and danger to other activities, and special regard shall be had to fishing and shipping.

(2) The main towing arrangement shall be used in all planned towing operations.

(3) Weather restricted operations or unrestricted operations shall be performed without exceeding the unit's design criteria.

(4) Weather restricted operations and unrestricted operations mean

a) «*weather restricted operations*»: Operations with reliable weather forecasts, where the operation's reference period ( $T_R$ ) is less than 96 hours and the planned operation period based on a conservative schedule for the operation ( $T_{POP}$ ) is less than 72 hours.

$$T_R = T_{POP} + T_C$$

where

$T_C$  = Estimated maximum contingency time.  $T_C$  shall be added to cover general uncertainty in  $T_{POP}$ , and possible contingency situations that will require additional time to complete the operation.

b) «*unrestricted operations*»: Operations where either  $T_R$  is of longer duration than 96 hours or  $T_{POP}$  is of longer duration than 72 hours or where the weather forecasts are unreliable.

(5) Before the start of a weather restricted operation

a) an updated weather forecast for each 12 hour period of the waters in question shall be obtained;

b) the weather window shall be three times the planned operation time. Alternatively, the risk-based method specified in DNV-OS-H-101, section 4, or an equivalent standard may be applied to estimate the weather window. When using a risk-based method, the weather window shall not be less than 1.5 times the planned operation time.

(6) Environmental criteria for unrestricted operations shall be based on extreme value statistics for the areas in question.

(7) Unrestricted operations shall not be carried out if the weather forecast predicts weather, waves or current which may pose a risk to life, property and the environment.

### Section 11 Additional requirements for self-elevating units during transit

During towing, the legs of a self-elevating unit shall be secured in a position accepted by the MOU classification society.

(2) Before the start of a weather restricted operation

a) safe jack-up locations along the tow route shall be established to ensure that the distance between possible emergency jack-up locations is not more than 12 hours;

b) the following deck cargo requirements shall be met:

i. The deck cargo shall have a permanent location.

ii. The deck cargo shall be accounted for in the design and operation criteria.

iii. The deck cargo shall be secured in order to withstand environmental loads that may occur during the towing operation, and heeling caused by the most unfavourable damage to the unit.

(3) During unrestricted operations

- a) deck cargo shall not be carried;
- b) there shall only be personnel on board for periods when this is necessary for the execution of the towing operation.

## **Chapter 6. Fender system**

### *§ 12 Requirement for fender system*

Mobile offshore units shall have a fender system appropriate to the unit's towing arrangement to protect against damage to the construction during towing operations.

## **Chapter 7. Risk assessment and procedures**

### *Section 13 Risk assessment*

(1) Prior to each transit, the company shall carry out a risk assessment which shall at least include

- a) necessary personnel;
- b) the number of towing vessels in relation to the consequence of a single error, e.g. line breakage or breakdown of the engines;
- c) towing vessels, including towing equipment and arrangement;
- d) weather conditions in relation to design criteria;
- e) the reliability of the weather forecast;
- f) the unit's towing equipment and arrangement;
- g) impact-absorbing equipment;
- h) safe distance to towing vessel during hook-up;
- i) seafastening;
- j) planned tow route, including port of refuge and bunkering station;
- k) ballasting;
- l) any additional measures during towing in coastal waters or in areas with other installations;
- m) contingency plan in case the operation criteria are exceeded;
- n) availability of sufficient towing force;
- o) limiting oil and chemicals on board to a level necessary for the unit's safety and activity during transit.

(2) For self-elevating units, the risk assessment shall also include

- a) seabed conditions;
- b) pre-loading;
- c) safe jack-up locations along the planned tow route.

### *Section 14 Procedures*

(1) The unit shall have a procedure for the planning and performance of transits, which shall at least include

- a) planning and preparation of how towing or transits shall be carried out;
- b) check list for preparation and performance of transits, including weather forecast, seafastening, weathertight and watertight closing;
- a) relevant structural restrictions and operational limitations, e.g. wave height, wave period, wind, current, deck cargo, draught and temperature;
- d) diagrams showing
  - i. wind forces as function of wind velocity;
  - ii. current forces as function of current velocity;
  - iii. wave drift forces in relation to significant wave height and period;

- e) stability data;
  - f) general arrangement;
  - g) specification of thrust, including level of redundancy, provided by the unit's own propulsion machinery (if fitted);
  - h) ballast system;
  - i) required personnel and competence;
  - j) safety equipment;
  - k) the towing design load for the towing equipment and arrangement, including the emergency towing system;
  - l) planned methods for establishing a new towing connection;
  - m) critical events, e.g. line breakage, breakdown of the engines, extreme weather;
  - n) anchor particulars (if fitted).
- (2) For self-elevating units, the procedure also include
- i) securing of legs;
  - h) inspection of leg wells.

## **Chapter 8. Final provisions**

### *Section 15 Exemptions*

(1) The Norwegian Maritime Authority may, upon written application from the company, grant exemptions from the requirements of these Regulations if one of the following requirements is met

- a) it is established that the requirement is not essential and that it is justifiable in terms of safety
- b) it is established that compensating measures will maintain the same level of safety as the requirement of these Regulations
- c) It is established that the requirement hinders the development and use of innovative solutions when such solutions will maintain the same level of safety as the requirement of these Regulations.

(2) Statement from safety representative shall be attached to the application for exemption.

### *Section 16 Transitional provision*

As an alternative to sections 2 to 12 Appendix I may be complied with until the next certificate renewal if one of the following requirements is met

- a) the unit is certified before 1 January 2015;
- b) building contract has been placed before 1 January 2015.

### *Section 17 Entry into force*

These Regulations enter into force on 1 January 2015.

As from the same date the Regulation of 17 December 1986 No. 2319 concerning field moves and towing of mobile offshore units and concerning towing system and mooring of supply ships at such units is repealed.

## Annex I

*cf. section 16*

*(Excerpts from the Regulation 17 December 1986 No. 2319 concerning field moves and towing of mobile offshore units and concerning towing system and mooring of supply ships at such units)*

### § 6

#### ***Towing and field moves***

1. Towing or field moves by means of a mobile offshore unit's own propulsion machinery shall not take place without prior notification to the Norwegian Maritime Authority.
2. Towing or field moves by means of a mobile offshore unit's own propulsion machinery shall be carried out in accordance with the international and Norwegian rules and regulations in force at the time in question. <sup>1</sup> The towing/field moves shall take place in such a way that it causes the least possible encumbrance in the area. Special regard shall be had to fishing and shipping.
3. Essential personnel only may remain on board self-elevating units during towing. All necessary safety measures shall be taken.
4. When making a field move (not more than 12 hours between possible jack-up locations) with a self-elevating unit, those positions where jacking up of the unit is possible and safe, shall be indicated in the track marked on the chart. Maximum distance between these jack-up locations shall be such that it is possible to tow and jack up in the indicated position within 12 hours. The necessary towing force shall be calculated with due regard to expected current, wind and weather conditions. Necessary information to carry out such calculations shall be contained in the operations manual
5. Prior to start of each 12 hour towing period mentioned in subsection 4 above (for self-elevating units), there shall be a favourable weather forecast for the following 72 hours for the waters in question. There shall further be a weather forecast showing that the conditions for the next 12 hours after jacking down will be within the maximum allowable environmental conditions given in the operations manual. Otherwise jacking down shall not be commenced.
6. Prior to commencing an ocean tow (more than 12 hours between possible jack-up locations) of a self-elevating unit, a special permission shall be obtained from the Norwegian Maritime Authority.
7. The operation manual shall contain instructions as to how a tow normally shall be carried out as well as detailed check lists or similar providing the necessary information on preparations, weathertight and watertight closing, calculations, etc. to be carried out prior to and during a tow and a field move. In addition, the following background information shall be included in the operations manual:
  - limiting data on each mode of operation during the towing/field move, such as maximum load, wave height, wave period, wind, current, draught, temperature, etc.
  - complete resistance curves for wind, current and waves up to maximum environmental conditions for calculation of the total towing resistance which the unit will be exposed to during towing, from which it shall be possible to calculate necessary towing force and number of towing vessels (tugs), and also speed of drifting under extreme weather conditions.

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<sup>1</sup> Reference is made to, inter alia, MSC/Circ. 884 of 21 December 1998 – Guidelines for Safe Ocean Towing.

## § 7

### *Requirements for the towing system*

1. Mobile offshore units shall be provided with a main towing system, emergency towing system and narrow water towing system. Omission of the main towing system is accepted provided one of the following conditions is met:
  - a) The mobile offshore unit has a ship's hull, is certified for independent navigation and complies with all provisions of § 7 subsection 2; or
  - b) The mobile offshore unit has the Norwegian Maritime Authority's Equipment Class 3 for the dynamic positioning system on board, is certified for independent navigation and complies with all provisions of § 7 subsection 2.
2. During towing in calm weather and no current, there shall always be available at least necessary towing force (or combined towing force and self propulsion) to achieve a speed of at least 5 knots for semi-submersible units and at least 3 knots for self-elevating units. Further, there shall be sufficient force to hold still and manoeuvre the unit safely against a wind of 20 m/sec. with associated wave and current of 2 m/sec.
3. If the unit cannot comply with the requirements in subsection 2 above by means of its own propulsion system, it shall employ towing vessels (tugs) having the necessary towing force.
4. The main towing system shall be arranged for one and two towing vessels (tugs), and in special cases for three.
5. The emergency towing system shall be arranged for two towing vessels (tugs). This may be arranged by using the ordinary anchor line, or a similar system.
6. The narrow water towing system shall be arranged in such a manner and for such a number of towing vessels (tugs) that safe towing and manoeuvring can be carried out.
7. The loads for which the towing system is dimensioned shall be given in the operations manual.
8. If a break occurs during ocean towing, emergency towing and narrow water towing, it shall be possible to quickly establish a new towing connection in a safe manner under all weather conditions. Planned methods shall be given as background material in the operations manual.
9. The main towing system shall be dimensioned for at least the towing force which is necessary to:
  - keep a speed of 5 or 3 knots (cf. subsection 2 above) in calm waters
  - hold the unit still against a wind speed of 20 m/sec. with associated waves and a current of 2 m/sec.

The main towing system shall, however, be dimensioned for 75 tonnes.
10. Construction of the towing system
  - 10.1. The main towing system shall consist of at least:
    - Two attachments to the unit
    - Two chain/wire connections to the unit
    - One triangular plate or equivalent (if a towing vessel (tug) is used)
    - One «weak link»
    - Shackles for connections



- 10.2. The attachments to the unit shall be dimensioned with a safety factor of 3 in relation to the yield strength of the material, taking into account a towing direction of 0°–90°, off centerline both sides.
- 10.3. Where a bridle is used, the attachments for this shall be as far apart as possible.
- 10.4. The position, construction and arrangement of the attachments shall be such that it is reasonably easy and quick to change the chain/wire connection in calm waters.
- 10.5. The towing pennants shall consist of chain or steel wire rope, or a combination of these. Where the connection is subject to specially heavy wear and tear (e.g. hawserhole), a chain shall be used.
- 10.6. Each chain-/wire connection shall have a breaking strength of at least 3 times the static bollard pull of the towing vessel (tug) and normally a length approximately equal to the distance between the two towing attachments.
- 10.7. The towing pennants and «weak link» shall be fitted with «hard eyes».
- 10.8. When one towing vessel (tug) is used, a «towing heart» (triangular plate) or equivalent shall be used when connecting the chain/wire connection mentioned in subsection 10.1<sup>2</sup> above. Allowable bollard pull is then equal to that per tug, calculated according to subsection 10.6<sup>3</sup> above.
- 10.9. The shackles in both ends of the chain/wire connection and in both ends of the «weak link» shall have a breaking strength which is higher than the breaking strength of the strongest part of the towing system.
- 10.10. «The weak link» shall be the weakest part of the complete towing system. The length ought to be approx. 40 – 60 metres so that connection to the towing vessel (tug) can be executed at a safe distance from the unit. The breaking strength should be approx. 2-3 times the maximum allowable static bollard pull. «The weak link» shall be placed between the chain/wire connection (or triangular plate) and the towing line of the tug.
- 10.11. It shall be possible to retrieve the chain/wire connection in case one part of the towing system should break. This retrieving system may consist of a line from each chain/wire connection to a winch or crane on the deck of the unit and the line from it shall have sufficient capacity to retrieve the combined load of the chain/wire connection with shackles and «weak links» and 150 metres of towing wire of the heaviest type normally used for towing the unit. (If there are water depths of more than 150 m within the towing area in question, and there is a need to change towing wire, calculations shall be based on the relevant maximum water depth). After retrieving the chain/wire connection, it shall be possible to demount a damaged towing line under all weather conditions, and also to change «the weak link» if necessary.
- 10.12. The following spare parts shall be on board the unit during ocean towing:
  - One chain/wire connection (complete)
  - Three shackles for «the weak link»
  - Three «weak links».
11. Equipment which is part of the towing system such as wire, chain, shackles, etc. shall be supplied together with a factory (test) certificate (as for components for hoisting gear).
12. Alternative systems

Alternative towing systems giving the same operational safety may be used.

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<sup>2</sup> Corrected compared to the text of the Regulations, which had the wrong reference.

<sup>3</sup> Corrected compared to the text of the Regulations, which had the wrong reference.

§ 8

*Mooring of supply ships, etc.*

1. The unit shall be so constructed and have such proper fender systems, buoyage systems or similar arrangements as to make safe transfer of persons and goods to or from the unit possible without creating hazards for platform, vessel, persons or goods. At least two alternative ways for mooring and safe transfer of persons and goods shall exist.
2. Vessels shall not moor, be moored or remain alongside the unit if wind and weather conditions create dangers for the vessel or the unit.
3. The mooring arrangement for the supply ship shall be such that the risk of the supply vessel coming into contact with the unit's legs, columns, etc. is reduced to a minimum, and such that the risk of break is as small as possible.