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|  | <b>TECHNICAL SPECIFICATION</b>      | Nº: I-ET-3010.00-5400-947-P4X-005 |               |
|   | CLIENT:                             | -                                 | SHEET: 1 of 7 |
|   | JOB:                                | -                                 | -             |
|   | AREA:                               | -                                 | -             |
| SRGE  | <b>TITLE: RESCUE BOAT AND DAVIT</b> |                                   | INTERNAL      |
|   |                                     |                                   | ESUP          |

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### INDEX OF REVISIONS

| REV. | DESCRIPTION AND/OR REVISED SHEETS  |
|------|--|
| 0    | ORIGINAL ISSUE (Cancels and replaces I-ET-3010.00-5400-947-PPC-011 RESCUE BOAT AND DAVIT). |
| A    | REVIEWED WHERE INDICATED.  |
| B    | REVIEWED WHERE INDICATED.  |
| C    | REVIEWED WHERE INDICATED.  |
| D    | REVIEWED WHERE INDICATED.  |
| E    | REVIEWED ITEMS 4.2.4.1 AND 4.2.4.4 WHERE INDICATED AND EXCLUDED ITEM 4.2.4.5.              |
| F    | REVIEWED ITEMS 4.2.4.1, 4.2.4.4 AND 5.   |

|           | REV. 0      | REV. A   | REV. B    | REV. C    | REV. D    | REV. E    | REV. F    | REV. G | REV. H |
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REV. F

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TITLE: RESCUE BOAT AND DAVIT

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## 1 INTRODUCTION

This document establishes mandatory requirements for rescue boat and corresponding davit systems specification, which shall be installed in the Offshore Units.

## 2 REGULATIONS, CODES, STANDARDS AND REFERENCES

Regulations to be followed in the design, installation and testing of the rescue boat are stated below:

- IMO - SOLAS: Convention for the Safety of Life at Sea – 1974 and Amendments in Force;
- IMO - LSA CODE: International Life-Saving Appliances;
- IMO - Resolution A-656 (16): Fast Rescue Boats;
- IMO Resolution MSC 81(70): Testing of Life-Saving Appliances;
- Requirements of the Classification Society of the Unit;
- Applicable Rules of the Brazilian Maritime Administration (DPC) - NORMAM;
- IEC 60079-10-1: Classification of Hazardous Areas;
- IEC 60529 – Degrees of Protection Provided by enclosures (IP Code);
- I-ET-3010.00-5140-712-P4X-001 - LOW-VOLTAGE INDUCTION MOTORS FOR OFFSHORE UNITS.
- I-ET-3010.00-5140-700-P4X-001 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS.
- I-ET-3010.00-5140-700-P4X-002 - SPECIFICATION FOR ELECTRICAL MATERIAL AND EQUIPMENT FOR OFFSHORE UNITS.
- I-ET-3010.00-5140-700-P4X-003 - ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS.
- I-ET-3010.00-5140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEM OF OFFSHORE UNITS.

## 3 ABBREVIATIONS AND DEFINITIONS

### Abbreviations

- **DPC:** Diretoria de Portos e Costas.

### Definitions

- **Davit:** Structure made of steel, which is used to launching a lifeboat;

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- **Rescue Boat:** Quick rigid hull boat, open, motorized, to rescue shipwrecked

## 4. TECHNICAL REQUIREMENTS

### 4.1 General

All the equipment and fittings of the rescue boat and corresponding davit assembly shall be in accordance with IMO-LSA CODE.

### 4.2 Requirements for Rescue Boat

Rescue boat shall be built on a stiff keel, according to requirements described in item two (02) and, additionally, to that described below.

#### 4.2.1 Requirements for constructions

- 4.2.1.1 Shall be protected all around with fenders or not inflated bumpers to prevent damages from bumping onto other objects or fixtures.
- 4.2.1.2 Shape and size shall be such that freeboard and stability are suitably ensured when fully loaded (persons and equipment) in choppy sea. It shall be able to keep afloat with positive stability, even if flooded and/or with hull damage.
- 4.2.1.3 Boat shall be made of materials able to withstand contact with hydrocarbons and the effects of the weather, remaining with fluctuation during thirty (30) days in the water in spite of sea condition.
- 4.2.1.4 When in use, shall be able to withstand changes in temperature ranging from 12°C to 60°C.
- 4.2.1.5 Deck shall be waterproof, non-slipping type and be suitable for crew to perform work on it.
- 4.2.1.6 Scuppers shall be provided with a check valve to drain water off the deck automatically and there shall be means for crew to drain water away swiftly.
- 4.2.1.7 Boat shall be provided with a semi-automatic or automatic means of self-righting, where by it shall take no longer than 30 seconds to become upright again.
- 4.2.1.8 All controls of the boat must be safe and effective in offshore environments and operated from a main console.
- 4.2.1.9 There shall be a suitable towing device.
- 4.2.1.10 Seats shall be fixed, as low-lying as possible and so arranged that when occupied, the boat remains upright.



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4.2.1.11 Lifting system shall be rigid and fixed to the boat though it must allow hook/unhook main hoisting rope at one single point. The suspension system shall permit the release of the brake with a load of 1.1 times the mass of the vessel with its full load of people and fuel and equipment.

4.2.1.12 Rescue boat shall be strong enough to bear a full load with its hull out of the water, held up only at hoisting point.

4.2.1.13 Inside and outside painters and life-lines fastenings fixtures shall be reinforced.

4.2.1.14 A searchlight with a horizontal and vertical sector of at least 6 degrees and a measured luminous intensity of 2500 cd which can operate continuously for not less than 3 h shall be installed on the rescue boat.

#### 4.2.2 Requirements for capacity

4.2.2.1 Boat length shall not be shorter than 6.0 meters nor longer than 8.5 meters and shall be capable of carrying at least six (06) persons, one of them lying on a stretcher.

#### 4.2.3 Requirements for autonomy

4.2.3.1 There shall be enough fuel capacity on board to allow rescue boat to run continuously for at least 4 hours at a speed of at least 20 knots in calm water, with a suitably qualified crew of at least 3 persons and minimum speed of 8 knots, full loaded (persons and equipment).

#### 4.2.4 Requirements for engine

4.2.4.1 Rescue boat shall be powered by outboard motor or inboard motor with covered propeller for human protection. The engine fuel shall be diesel.

4.2.4.2 Rescue boat engine shall be automatically shut off if rescue boat overturns and shall be easily started again. Fuel system shall be designed as to prevent loss of fuel if boat capsizes.

4.2.4.3 Rescue boat engine starter must be electric with 12 VDC battery. An automatic battery charger device shall be provided to be attached from outside with a self-releasing plug to allow easy disconnect when boat is to be lowered. An additional engine starting system shall be provided, completely independent from the main system, including starting motor, fully available and easily operated by a single person.

4.2.4.4 Brazilian technical assistance shall be available for rescue boat, including the diesel engine.

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#### 4.2.5 Requirements for battery

4.2.5.1 Battery shall be sealed type, so as to prevent electrolyte being spilled if boat capsizes.

#### 4.2.6 Requirements for identification

4.2.6.1 Rescue boat shall be painted in safety orange color (Munsell 2.5 YR 6/14), and be provided as the items below:

- One (01) Resuscitator;
- Rustproof data plate, fixed at a clearly visible position in the bow of the boat with the following information:
  - Manufacturer identification;
  - Number of prototype certificate;
  - Manufacturer's serial number;
  - Date of manufacture;
  - Size of crew;
  - Boat dimensions;
  - Classification Society.

4.2.6.2 The plate with start-up and operating instructions shall be written in Brazilian Portuguese language and subjected to PETROBRAS approval. The plate must be affixed in a place inside the boat, such that boat operator can see it easily.

4.2.7 Equipment rescue boat shall be stowed within the boat in such a way to be easily reached, but not to interfere in the proceedings of the vessel.

4.2.8 Rescue boat shall be provided with proper high UV resistant protection canvas that fits with boat shape that can be easily and quickly removed before boat launching.

#### 4.3 Davit

4.3.1 Electrical installations shall comply with I-ET-3010.00-5140-700-P4X-001 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS and I-ET-3010.00-5140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEM OF OFFSHORE UNITS. Electrical material and equipment shall comply with I-ET-3010.00-5140-700-P4X-002 - SPECIFICATION FOR ELECTRICAL MATERIAL AND EQUIPME FOR OFFSHORE UNITS. Electrical content shall comply with I-ET-3010.00-5140-700-P4X-003 - ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS. Electrical motors shall comply with I-ET-3010.00-5140-712-P4X-001 - LOW-VOLTAGE INDUCTION MOTORS FOR OFFSHORE UNITS.

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- 4.3.2 Rescue boat davit winch shall be driven by an electric motor, capable of lifting up fully loaded rescue boat at a rate of not less than 0.8 m/s.
- 4.3.3 Rescue boat davit shall be A-Frame type.
- 4.3.4 Rescue boat descent shall take place by gravity, calculated as per formula displayed in IMO - LSA CODE.
- 4.3.5 Rescue boat shall always be visible to the person who operates the lowering gear and shall be installed onboard of the unit in order to support the rescue boat fully manned and to lower and lift it up, using winch and steel ropes.
- 4.3.6 A stand by hand-operated hoisting system shall be provided and installed within davit assembly. This system must be capable of lifting fully loaded rescue boat (people and equipment) in case of loss of electric power and must be operated by a single person.
- 4.3.7 Rescue boat shall lie horizontally when stowed, for easy access.
- 4.3.8 In addition to the requirements of LSA CODE for fast rescue boat launching appliance, the davit must contain all devices needed for the proper operation of davit, such as control console, electric panel, a device for connection in the battery charger, electric motor or hydraulic system, davit winch, etc. Davit assembly must need only to be connected to electric power source to be ready to start operating.
- 4.3.9 There shall be limit switch interlock to prevent rescue boat from colliding with the davit, and to prevent winch from operating when rescue boat has been stowed away.
- 4.3.10 All davit electrical equipment shall be suitable for working within areas specified, at least, as Group IIA, Zone 2, T3, according to IEC-61892-7. Hazardous Area Classification plans shall be consulted.
- 4.3.11 All equipment and materials shall be suitable for offshore environment (marine atmosphere).
- 4.3.12 Davit shall be painted yellow color (Munsell 5Y 8/12).

## 5 MINIMUM DOCUMENTS REQUERIDED

The equipment's Certificates of Approval issued by **Brazilian Maritime Administration (DPC)**.