



## ERRV AS AN EMERGENCY PROTECTION COMPONENTS IN THE OFFSHORE SECTOR ACTIVITIES

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### ABSTRACT

The article in the short form presents a problem of protection of human activity in the offshore sector. Authors particularly focused on the analysis and presentation of highly specialized vessels — ERRV (Emergency Response and Rescue Vessels) which are specially designed to ensure safety in the offshore sector; their equipment and its appropriate use. Specific solutions and measures, their capabilities and limitations were presented.

Key words:

Emergency Response and Rescue Vessels, emergency protection, offshore sector.

### Research article

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## INTRODUCTION

In the season of fast development of the offshore sector and accompanying it the incidence and accidents while people are losing their lives, one of the basic problems undoubtedly is ensuring safety and fully effective rescue operations in the event of an unexpected failure of platform or some other offshore installation.

Analysis of the platforms accidents in which a lot of people lost their lives like Deepwater Horizon — 20th of April 2010 (11 victims) or Piper Alpha — 6th of July 1988 (167 victims) revealed clearly and precisely how important is the element of very quick response as well as ensuring the place of safety for the victims in the event. The PFEER (Prevention of Fire, Explosion and Emergency Response) publication has been compiled and implemented. This document is the basic legal act based on which accurately defined tasks and duties have to be performed by highly specialized rescue vessels of the offshore sector — ERRV (Emergency Response and Rescue Vessels).

Of course, they are not the only ones, in a wide range in addition to them, rescue tasks are also carried out by specialized rescue helicopters or for example MPSV (Multi Purpose Supply Vessel). MPSV are multitasking vessels, which the basic tasks are supplying and servicing, delivery and logistics functions of offshore installation, but they are fully equipped and certified in respect of rescuing and providing a place of safety for survivors as an ERRV vessels as well. Therefore, later in the article, the authors focus on vessels specifically designed for rescue purposes — ERRV.

## REQUIREMENTS AND AREAS OF ACTIVITY TO BE ENFORCED TO ERRV VESSELS

As the name suggests, ERRV are vessels for quick response and rescue in danger. The fundamental requirements which an ERRV must satisfy are that it should be capable of:

- rescuing from the water or recovering persons and providing them with medical aid;
- acting as a ‘Place of safety’ in accordance with PFEER;
- providing on scene co-ordination, as required, in accordance with relevant installations’ ERP (Emergency Response Plan);

- participating fully in the execution of the installation collision avoidance strategy, e.g. to monitor the Safety Zone, warn approaching vessels and the Installation of the risk of collision and prevent same where possible;
- acting as a reserve radio station [2].

To ensure that all of the above tasks will be fulfilled properly and safely, it is necessary to equip the vessels with appropriate rescue measures, firefighting and neutralization and counteraction spreading oil spills specialized equipment. Also; to effectively perform the tasks, these units should have appropriate maneuvering characteristics significantly different from maneuvering characteristics of typical merchant vessels.

Construction requirements of ERV vessels [1]:

- high maneuverability characteristics (azimuth propulsion, becker's rudder, adjustable propeller, two propellers etc. — the ship should be able to turn back 'in place');
- all maneuvers should be possible for one person to do without the helmsman (2 ~ 4 maneuvering console — forward, back and both wings on the bridge);
- visibility from the bridge 360°, particularly on rescue zones, helicopter winching areas and rescue boat platforms;
- special platform to picking up survivors by helicopter (winching area);
- safeguards (steel covers) on the forward windscreens on the bridge, special durability all panes on the bridge — to resist an extreme weather conditions;
- survivors area — minimum 50 seats for survivors;
- decontamination area — outdoor showers to decontaminate survivors from the oil — minimum 10 and inside to provide a normal toilet/shower for survivors;
- reception — in which the initial qualification of survivors on 'requiring immediate help', 'who can wait' and 'on stable life functions' is carried out;
- treatment room — for providing paramedical first aid and help to survivors;
- recovery area — 20 beds in a suitable room for those who should be hospitalized;
- full equipment in medical supplies for first aid and more.

In addition to required maneuvering characteristics, ERV have specialized equipment to rescue and pick up survivors from the water. These include: FRC (Fast Rescue Craft), DC (Daughter Craft), Dacon Scoop, Jason Cradle and Rescue Basket. Additionally, on each of these type of vessel there is at least one, usually two AMA (Advanced Medical Aider) — paramedics, specially trained in providing general and specialist help related to any possible accident on the platform.



Fig. 1. Typical ERRV vessels

FRC (Fast Rescue Craft) pontoon 'open' boat due to the construction is able to take six survivors. Example FRC Searider 6.0:

- length 6 m;
- width 2.3 m;
- draft 0.8 m;
- max speed 40 knots.



Fig. 2. FRC Searider 6.0

DC (Daughter Craft) is a fast, highly maneuverable rescue boat, having a 'closed' cabin for the crew and the survivors. Launched from the 'mother ship' for the purpose of rescuing and removing survivors from the water, can be used for towing another boat, rescue basket or liferaft. The additional operational tasks for DC can be close standby — assistance when overtheside jobs are carried out on the platform or during operations with the helicopter when the 'mother ship' is busy with other tasks. Daughter Craft should be equipped with a system of horizontal transport of survivors from the water — Jason Cradle.

DC operational conditions and limits:

- two minutes to put to the water, after the alarm is announced onboard the 'mother ship';
- four minutes to reach and take the first survivor out of the water;

- twenty minutes for picking up four survivors from the water;
- max wind speed operational limit up to 30 knots;
- max wave height up to three meters — in these conditions DC can perform its duties up to four hours.
- max operational distance from the ‘mother ship’ — 10 nautical miles.

There are many different DC constructions and thus technical solutions, but the basic requirements for operability are always the same. An example of such a boat can be DELTA ‘Phantom’ with parameters:

- length overall 10 m;
- beam 3.3 m;
- draft 0.5 m;
- max speed 38 knots;
- range at 20 knots ~ 100 sea miles;
- max number of survivors taken 15 people.



Fig. 3. Daughter Craft DELTA ‘Phantom’

Another example for DC constructions and technical solutions can be MUNIN 1200.



Fig. 4. Daughter Craft MUNIN 1200 MKI waterjet

Parameters of DC Model MUNIN 1200 MKI:

- length overall 11.95 m;
- beam 3.51 m;
- height 3.75 m;
- max number of survivors taken 24 persons;
- max speed 30 knots.

Another mandatory rescue equipment for the ERRV is Dacon Scoop — a rescue system for taking survivors from the water directly to the vessel deck. It is a 'mobile' net suspended from a ship's crane on one end, on the other end attached to the ship's side in the RESCUE ZONE area.

Dacon Scoop is designed for taking all persons from the water (survivors and non survivors) in poor weather conditions — net range 4 to 6 m from the ship's side. When is not in use, should be located from the inside of one of the RESCUE ZONE — it allows to quickly use it if necessary (eliminate any transport necessities).



Fig. 5. Dacon Scoop in use and stowed

Another element is Rescue Basket — designed for use in emergency situations — taking survivors out of the water. Partially submerged in the water what makes easier the entry of survivors into the basket. It is stored in a place allowing quick and easy dropping it into the water — on the water laid by a ship's crane.

All above rescue equipment's have a significant limitation regarding to weather conditions.

Up to sea state 5 Beaufort scale — no restrictions for DC/FRC operations. The limitation of routine operations such as exercises, training, transfer between ships, etc. starts at sea level 6B, with state 7B it is only possible to perform real rescue operations for life saving.



Restriction for any operations using FRC/DC for sea state 8B due to the risk for life for the crew of the rescue boat — however, it is still possible to use mechanical recovery equipment for picking up survivors/non survivors out of the water — Dacon Scoop. From the sea level above 9 Beaufort scale it is strictly forbidden to use any means of rescuing survivors due to the minimal chance of success of such the operation and a significant threat to the crew operating equipment on the ship.



Fig. 6. Rescue Basket

Depending on the number of crew, ERRV vessels are classified into three groups presented in tab. 1.

Tab. 1. Classification of the ERRV depending of the crew number

ERRV group	Total manning	Grade 1 seamen (minimum)	Grade 2 seamen (minimum)	Advance Medical Aiders	FRC crew
A	15	2	3	2	9 incl. 3 cox'n
B	12	2	2	1	6 incl. 2 cox'n
C	9	2	1	1	4 incl. 2 cox'n

Depending on the size of protected platform/unit, it is required to use the appropriate class of ERRV vessel. Protection of the installation depends on the manning personnel onboard:

- group A ERRV is one acting for an installation which is manned by particularly large numbers, significantly over 300 persons;

- group B ERRV is one acting for an installation which has a manning level falling between 20 up to 300 persons;
- group C ERRVs act only for an installation which is manned by very small numbers, up to about 20 persons.

Due to the form and limitations of the article, only selected elements of the complex rescue system of the offshore sector were discussed. It is also worth to mention about the significant role of helicopter emergency services. Effective operation of rescue and emergency services in this sector is a crucial for ensuring the safety of persons serving onboard installation.

## CONCLUSIONS

Despite the existing regulations for saving life at sea and preventing pollution: SOLAS, MARPOL etc., the progressive expansion and exploitation of the offshore sector has imposed legal regulations regarding rescue operations in this sector. Highly specialized ERRV vessels have been set up to serve specific duties to safeguard human activity in the sector. The characteristics of vessels and equipment, touched on in the article tasks and pieces of equipment do not fully cover the problem of rescue in this industry. Researches, risk analyses and assessments, new technical solutions and legal regulations are constantly carried out to ensure maximum safety for persons serving in the offshore sector.

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# **ERRV JAKO KOMPONENT ZABEZPIECZENIA RATOWNICZEGO W SEKTORZE OFFSHORE**

## **STRESZCZENIE**

W artykule przybliżono kwestię zapewnienia bezpieczeństwa ludziom wykonującym pracę na morzu w sektorze offshore. Autorzy skupili się głównie na analizie i prezentacji specjalistycznych jednostek ERRV (Emergency Respose And Rescue Vessels), które zostały zaprojektowane dla zabezpieczenia wszelkich morskich działań ratowniczych. Przedstawiono środki ratownicze, możliwości i ograniczenia operacyjne ERRV.

Słowa kluczowe:

statki ratownicze ERRV, zabezpieczenie ratownicze, sektor offshore.

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