"Mircea cel Batran" Naval Academy Scientific Bulletin, Volume XVIII – 2015 – Issue 1
Published by "Mircea cel Batran" Naval Academy Press, Constanta, Romania // The journal is indexed in:
PROQUEST SciTech Journals, PROQUEST Engineering Journals, PROQUEST Illustrata: Technology, PROQUEST Technology Journals, PROQUEST Military Collection PROQUEST Advanced Technologies & Aerospace

PORTABLE DEVICE OF FIRE SIMULATION ON BOARD MARITIME AND RIVER SHIPS

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Abstract. *The fire consists in the phenomena of burning initiated by a well-defined cause and triggered with or without the will of man. Being out of control, it produces damage and disruption and thus, it needs an act of a fire-fighting intervention with appropriate means. In order to prepare the crew for fast elimination of a possible fire on board a maritime or river ship, it takes a series of active measures which consist in the personnel's related periodic training on board under specific conditions. In this regard, a "portable mode simulation of fire" was built, with the stated goal of modernizing the vitality polygon of the Navy Academy to increase readiness, training and testing of embarked students and staff in a potential fire fighting. Portable fire simulation mode can be used on board of any ship, sea or river, so that the crew can be properly and specifically trained, even on ship it serves.*
Key word *: fire fighting, fire, ignition, portable, device*

The background of maritime sinister caused by fire.

The fire consists in the phenomena of burning initiated by a well-defined cause and triggered with or without the will of man. Being out of control, it produces damage and disruption and thus, it needs an act of a fire-fighting intervention with appropriate means [1]. In order to prevent and fight the sinister sea, legislative requirements submitted in international codes were introduced - Code for Fire Safety Systems.

These regulations provide various means of fire-fighting equipment which is mandatory for ships. In order to exercise the means of fire fighting, crews have developed and tested new equipment. However, in real-life cases, exceptions which may influence the conditions that complicate the situation could occur, exceptions such as the explosion of combustible liquids resulted from boiling, the overflowing of the tanks, the deformation or melting of building elements and technological equipment, but most often, due to lack of proper ventilation, the exceptional situation could consist in smoldering fires. All of these situations make the crew alarm occurrence or observation of a fire to be an essential part of the fight for the vitality of the ship, because the success of the operation in extinguishing of the fire and the limiting of damage are highly dependent on the efficiency with which the group operates in the firefighting process, as well as the state of the place where the fire outbreak occurred.

The importance of the training level of the crew that has the job to stand watch in case of fire is highly significant in relation to their skills of using the firefighting equipment. The equipment for firefighting must be permanently maintained in functioning conditions, but the most important component is the specific training of the crew, on the ship it serves. This paper highlights the fire simulation system that allows crews to be trained on board, without sending them to specially designed polygons, or endangering the ship or the people [4].

Portable Device of Fire Simulation.

Novelty, by creating "Portable Device of Fire Simulation on Board Maritime and River Ships" represents the possibility of real-time training embarked staff in order to develop their practical skills for handling modern means of water and fire fighting and the execution of specific missions [3]. Life security during sailing requires a high degree of complexity generated by the need to know the functioning methods of modern naval systems, as well as using such facilities in emergency situations. Therefore the fact that this installation is mobile, allows the groups from the compartments with a high risk of fire to have trainings. The scheme "The Portable Device of Fire Simulation on Board Maritime and River Ships" designed for the equipment compartment for fire fighting training in framework of the Naval Academy "Mircea cel Batran" is shown in Figure 1.

The Portable Device of Fire Simulation on Board Maritime and River Ships can be arranged in compartments of the ship, where it will launch a fire signal so that the intervention team will act as in real conditions of fire extinguishing [5].

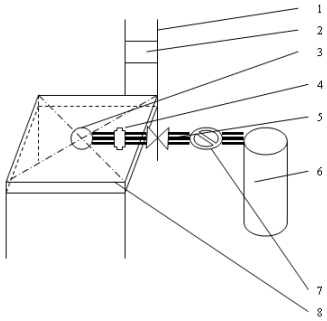

Fig. 1 The „Portable Device of Fire Simulation on Board Maritime and River Ships"

1.Gas detector support 2.Gas Detector 3.Burner 4.Gas solenoid 5.Gas valve 6.LPG Container 7.Gas regulator 8.Body portable way

Team training involves furnishing the ship with isolating and infrared radiation sensing equipment and a Thermal Infrared Camera. Firefighting team members will enter the training ship's compartments flooded with none-toxic smoke generated by suitable equipment and will seek the simulated fire. After discovering The Portable Device of Fire Simulation on Board Maritime and River Ships, the team will extinguish the flames and supervise the place ensuring that the device worked properly and the LPG cylinder 6 was closed automatically by gas detector 2.

The use of the "Portable Device of Fire Simulation of Fire on Board Ships Maritime and River"

The Portable Device operation involves a heat generating signal that can be detected by specific equipment. For this Portable Device, three conditions must be met: not present potential danger to the ship, to achieve functional purpose that of generating a small flame and ensure the automatic shutdown of gas after the flame has been extinguished by the crew, or if it has turned off accidentally before the arrival of the unit. To fulfill the first condition, the portable body was built of steel, a non-combustible material, which holds off any fuel element. The body belongs to the hull, where it generates the flame using burner 1, which meets the ignition of condition 2.

The firefighting group that trains for its' specific tasks, has 3 missions: the discovery of simulated fire, its' liquidation and supervising the place for accidental re-ignition prevention. The third operating condition of the Portable Device is provided automatically by gas detector 2 (Fig. 2), which after the extinction intervention of the flame provided by burner 3, it senses the presence of LPG and automatically commands its' interruption through solenoid 4, being independent from the firefighter's manual actions on valve 5.

Fig.2 The Picture of "Portable Device of Fire Simulation on Board Maritime and River Ships"

Conclusions

The Portable Device of Fire Simulation on Board Maritime and River Ships brings several clear advantages for the groups training in on-board fire risk existence: the preparation is performed directly on board in terms of its specific construction and its' existing facilities; the firefighters identify the nature of fire attack so they must choose the correct fire extinguishing substance (in this case, the combustible substance is liquefied petroleum gas); it improves the vitality group's way of acting, it increases the awareness of the ship through department researching. The Portable Device of Fire Simulation on Board Maritime and River Ships possesses a great character of novelty, constituting a highly effective logistic and teaching environment regarding the training of crews on board merchant or military ships.

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