DIVERS AND THE ANTITERRORIST PROTECTION OF OIL RIGS

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Rezumat: *În concordanţă cu Directiva 114/CE lucrarea identifică infrastructurile critice (IC) naţionale din zona de responsabilitate a Forţelor Navale şi analizează terorismul contemporan şi motivaţia lui evidenţiind faptul că în prezent securitatea mării nu este evaluată la nivelul necesar. Identificarea riscurilor, ameninţărilor şi punctelor vulnerabile din zonă şi depistarea factorilor critici care pot ameninţa platformele de foraj şi extracţie, conductele, rezervoarele subacvatice de stocare petrol şi gaze, navele, şenalul navigabil, cablurile de comunicaţii etc. constituie o prioritate operativă a specialiştilor Centrului de Scafandri. Protecţia efectivă a IC aflate sub apă se realizează prin intervenţia scafandrilor militari (grupe operaţionalizate NATO) sau a roboţilor subacvatici, necesitând comunicare, coordonare şi cooperare la nivel naţional, subregional, comunitar şi internaţional. De asemenea, lucrarea cuprinde o prezentare generală a activităţilor de bază ale scafandrilor de incursiune, deminori, de mare adâncime, fluviali etc. şi a suportului logistic de care aceştia dispun.*

Abstract: *It is easy to observe that the offshore zones especially the oil rigs, gas pipes and harbours are pointed with special interest by sabotage and terrorism actions. The complexity, multiple access possibility, intensive traffic and heterogeneous character of the activities performed in littoral zones or harbour perimeter, offers an "invitation" in order to facilitate terrorism intention. It is obvious that the solution when the global fear, concerning the terrorism actions, was exacerbated, especially after 11 September moment, the authorities attention was focused on defence complex designing. However, the success in antiterrorism war depends on essential factors such as: information on time, good potential, action methods related to the types of threat add answer back promptitude.*

Keywords: Diving Centre, divers, counterterrorism actions, offshore zone, oil rig.

1. Introduction

After a short peaceful period, at the end of the cold war, when everybody thought that we would live in a safer world, in a world without conflicts, there appeared to be exactly the opposite; the world became more insecure, the crisis and regional conflicts became predominant and spread worldwide.

In this new situation, the first order of business is promoting the actions in the intensely populated areas like the seaside (be it commercial or entertainment), in the shallow waters around the coasts, at oil rigs, gas pipes, underwater energy

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& communications wires etc. waters that will require other types of actions, another techniques, another type of training for the intervention teams, requires the improvement of search methods, detecting and neutralizing the enemies` devices.

The complex and dynamic nature of the missions that can be carried out in the operating zone of the Naval Forces, in the conditions of the modern war, missions carried out by the specialized units, be it independent or joint with other units/forces as well as the current geopolitical and geostrategic context of the Black Sea calls for new, specific missions. A growth in the importance of the Divers` Centre - a one of a kind, standard setting unit at a national level - is noticeable in the development of the missions in the interest points.

From the sum of situations that can occur in the battle against marine mines there emerged the two distinct types of actions that diver squads can take - these are: summoning for action and technical check-up against terrorism - systematic or training. The enemy making use of portable marine mines and improvised explosive devices, with terrorist intent or asymmetrical military actions.

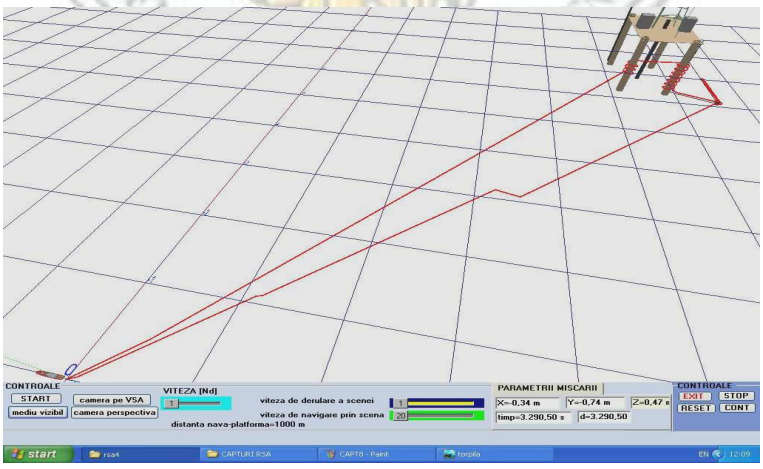

Fig. 1. Modeling and simulation example of the UAV surveillance trajectory concerning the drilling platform.

2. Contemporary terrorist phenomenon

Terrorism, or the war of our days, has become more and more the result of the deepening gaps between the democratic civilizations and the totalitarian civilizations, in which groups of people feel that they are oppressed, most of them going to underdevelopment, pre-conceived ideas, and lack of possibilities.

If in the past the terrorism had in view mostly politicians, diplomats, in our days it has become "blind" and has in view people of all socio-professional categories, who have nothing in common with the aim of that certain act, thus generating a state of confusion amongst the common people.

As a rule, terrorism can not be considered as a continuation of war with other aids. It can be said that terrorism is one of the most efficient way of fighting against the great military blocks, it is the weapon that brings together in order to negotiate the governmental forces and separatist organizations, such as: IRA (England), ETA (Spain), "Baader-Meinhof" (Germany), "The Red Brigade" (Italy), "The Red Army" (Japan), OEP or other groups from Libya, Pakistan, Afghanistan, Cecenia, India, Iran etc.

Due to the fact that the classical targets are not taken into account any more, the threat becomes general, and each of us can fall under such an attack. "Death trains" in Madrid in 11th March 2004 (199 casualties and 1497 injured), death buses and tubes", in London, 7th July 2005 (38 casualties and 180 injured), etc., are terrorist acts which showed once again, if necessary, that the terrorist attacks targets was not a certain socio-professional category, not even people of a certain country; the only aim was have as many victims as possible.

In figure 2 can see the proportions of the terrorist attacks as they appear between 2000 ÷ 2006 and the types of terrorist attacks in the 2005 year.

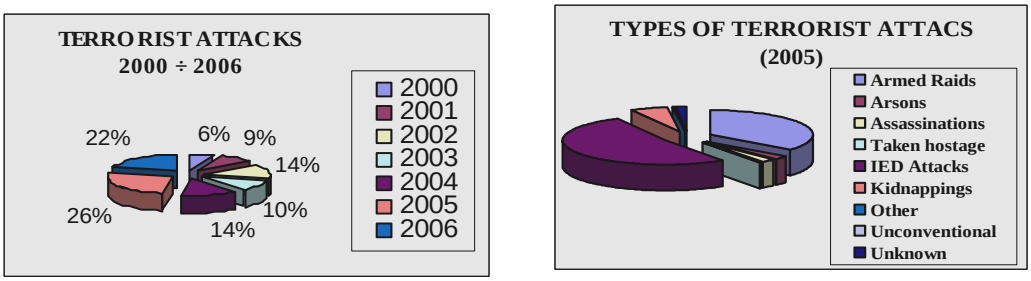

Fig. 2. About Contemporary Terrorist Attacks

Motivation of a terrorist attack - intolerance and extremism

In the last 25-30 years the world society met the terrorist phenomenon both at the national and international level, very different in what its forms and procedures are concerned.

The terrorist attacks that had as targets schools, institutions, business and political places etc., lead us to conclude that only devilish minds can act in such a way. Terrorists defy any moral and human norm, by also threatening the population neighboring the victims, in order to obtain political influence over a greater audience.

Water environment and terrorism

In what sea security is concerned (one can hardly forget the attack of a small self-suicide ship over the USA military ship Cole or of the French tanker Limburg - civilian ship) one can say that this is not well defined. Terrorist attacks do not choose their targets (military or civilian).

When commercial piracy is taken into account, the traffic of drugs, human beings, weapons (chemical, biological), one can state that sea security is not properly considered. The competent authorities seem not to be totally and well-prepared to face.

The vast unexplored territory, the richness of fauna and flora, of mineral resources, of oil and gas hold under seas and oceans, lead to the development of different industrial branches in order to exploit the immense underwater resources. Due to inadequate exploitation of the natural resources and increased traffic and transportation, we can see more and more often the negative effects of environment pollution. This way, a massive ecological misbalance is about to be produced. The whole biotic complex suffers irreversible changes with regrettable consequences, sometimes extended over several generations. Considering the continuous deteriorating environment status, any additional worsening negatively influences the biological potential of species reproduction and early development survival of life due to both the new environment status which is improper to the bios and the profound alterations of biotic complex within the ecosystem. Divers' activities, even though developed for specific military requirements, may satisfy the saving and protecting needs of ecosystems.

In our ages the rate between defense and environment is characterized by thigh cooperation. During peace time, military interfere in a positive way for conserving and protecting the environment.

The Romanian Black Sea Coast, which is over 200 km long, every year are reported mines adrift in the aria of Naval Forces jurisdiction. Our EOD divers execute the mine clearance operations within the navy area of responsibility. This work presents also technical and specialty assistance for the immersed civilian structures. (EOD = Explosive Ordnance Disposal)

The EOD divers activity during the time consists in assuring the protection of the Romanian Black Sea Coast, oil rings, gas pipes, underwater energy and communication wires and harbor facilities. One of the real tasks of these EOD divers is the disposal of mines and explosive ordnance remained from the II-nd World War (WW). These are adrift in the water or lay on the bottom exposed at the undercurrent force. This unexploded munitions and mines jeopardize the underwater environment and immersed structures or ships.

In accordance with the conception of training for combat divers, approved by the head of Romanian Naval Forces Head Quarters, one can find the following objectives regarding the activity of the matter:

For incursion divers:

1. Researching the seaside objectives;
2. Date and information gathering;
3. Freeing the rigs and ships;
4. Defense against underwater diversion;
5. Neutralizing portable mines and improvised explosives devices found on different immersed structures;
6. Launching from aircrafts existing on the ships;
7. Special Forces action.

For mine neutralizing divers (EOD divers):

1. Searching, detecting and destroying mines / explosive charges found on immersed structures;
2. Harbor defense and beach reconnaissance;
3. Offshore drilling platforms defense;
4. Passage for access for amphibious forces and naval communication jamming;
5. There are also activities in cooperation with specialized structures of the Ministry of Defense as well as training activities within the Antiterrorist Brigade - Bucharest etc.;
6. For preventing and counteracting terrorist actions EOD divers cooperating with international specialized forces;
7. Explosive ordnance disposal mission.

Our EOD divers execute the mine clearance operations within offshore zones and the navy area of responsibility: safety of navigation in / out the harbour, offshore drilling platforms defence, mine underwater reconnaissance, safety of underwater structures, ships and harbour facilities (passing locks, wet and dry docks, fuel supplying systems) and technical assistance to civilian structures.

For deep divers**:**

1. cutting and welding at the underwater structure of oil rigs and gas pipes, barrages, bridges and moorages;
2. non destructive control and mine monitoring concerning immersed structures;
3. objects recovery from the shipwrecks;
4. any intervention either civilian or military means

3. Divers in preventing and fighting counterterrorism actions

Usually an action plan of the Romanian military divers with attributions in the fight against terrorism is five stages: research, analyses and evaluation of the possible threat, security assurance, distribution of juridical responsibilities, actions in crises situations, namely after a terrorist attack.

Analyses and appreciation of the potential threat can be made, firstly, for determining the possibility of existing a possible attack, on the bases of the research results, as well as the appreciation of the vulnerability extent of the most probable to happen attack.

4. Achievements

Outlined performances:

- maritime continental plateau survey and complex works for installing the offshore oil drilling platforms (rigs);
- underwater pipe-lines mounting between fixed platforms and collection buoy;
- setting in place oil collecting buoy;
- installation of submarine gas pipe between platforms;
- several ship complete salvage works;
- underwater maintenance and repair works at hydro-technical dams;
- various underwater works for the shipyards of Constanta and Turnu Severin;
- technical and speciality assistance for the sealing and pressure leaks checks at Cernavoda nuclear power plant;
- destruction and disruption of several maritime mines;
- ships surveys, underwater recoveries and emergency towing.

5. Diving Centre Logistics Support

Diving Centre comprises all necessary compartments to select and train divers of all categories, provide them logistical support, hyperbaric technical facilities and medical assistance. As a higher level of command elaborates and implement training programs for divers and ships within SAR & Diving Unit.

The Romanian Diving Center implemented a quality system for industrial activities in accordance with ISO 9002 Standard, together with Germanischer Lloyd Certification. Currently, The Diving Centre is certified and authorized according to ISO 9902 for the following areas:

- ✓ **International Diving Certification of divers**
- ✓ **Underwater works**

Starting with 2002, the system will be brought up to date according to ISO 2000 Standard requirements

Scientifically Research Laboratory for Underwater Technology and Equipment Objectives (CPSA Lab) are:

- Scientifically and technologically research for technical means development and improvement of the diving procedures and underwater working techniques;
- Test and certification of the diving equipment and underwater tools;
- Elaboration of standards for underwater equipment.

Problems approached:

- Underwater breathing apparatus;
- Individual diving equipment and accessories;
- Underwater communication systems;
- Underwater tools and technologies;
- Transportation means for divers;
- Hyperbaric equipment and installations.

Achievements:

✓ fins, face and full face masks, pressure regulators, life jackets, air tanks, etc.
✓ wet and dry suits for divers;
✓ wire and wireless communication apparatus for divers;
✓ portable sonar for diver, pingers and pinger receiver;
✓ underwater cutting and welding equipment and technology;
✓ underwater transportation vehicle for divers, inflatable boats;
✓ two-place hyperbaric chamber;
✓ hyperbaric chambers for decompression.

Hyperbaric Laboratory

This unit has capabilities to:

- Train divers with different diving technologies and equipment;
- Test divers;
- Provide mix gas for diving;
- Treat diving accidents;
- Test and certificated for diving technologies.

Inside of the Lab there are two hyperbaric chambers for 4 persons each, coupled with a central wet simulator - working level max 500m which are supported by: gas analysers, pure and mix gas storage racks for diving and treatment, compressors and suppressors, surveillance closed TV system, communication system with audio decoder for deep sea diving, monitor system for diving parameters.

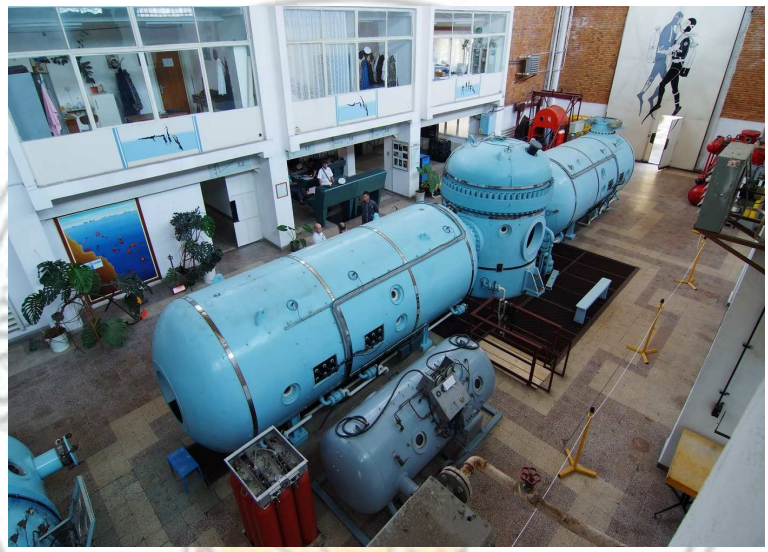

Fig. 6. Diving Centre Hyperbaric Laboratory

Hyperbaric Medical Centre

This unit has a medical team that is formed by 2 doctors and 2 medical assistants, which can accomplish the following tasks:

- ❖ medical selection of the divers;
- ❖ hyperbaric specific medical tests;
- ❖ diving accidents treatment;
- ❖ hyperbaric oxygen-therapy;
- ❖ medical diving assistance;
- ❖ medical personnel training;
- ❖ routine medical tests;
- ❖ hyperbaric medical research.

They have specific equipment for medical investigation, hyperbaric chambers for treatments and consulting rooms.

Activities carried out

- ➢ Tests of human body adaptability to hyperbaric environment;
- ➢ Oxygen test - 18 meters;
- ➢ Narcosis test - 72 meters;
- ➢ Deep dive test - 180 meters;
- ➢ Computer assisted processing of data from deep sea diving;
- ➢ Hyperbaric oxygen-therapy in cooperation with Universities of Constanta and Cluj-Napoca;
- ➢ Treatment of all decompression accidents;
- ➢ Treatment of intoxication.

In conclusion, the Romanian Diving Centre is the only authorised structure for certifying, licensing and training professional divers in Romania.

Conclusions

The future of our country is closely connected with Romanian Black Sea coast development. In order to ensure that Romania will polarize the Occidental interests, preserving a safe national territory is paramount. Romanian divers must contribute to the overall efforts of providing security within coastal areas that allow civilian activities to evolve freely and unharmed. Through their efficient actions, divers hold an important role in protecting the environment and civilian population.

Additionally, this paper shows a modeling and simulation example of the underwater autonomous vehicle (UAV) trajectory concerning the drilling platform and also UAV body designing and testing (through mathematical model) concerning its destination and movement elements.

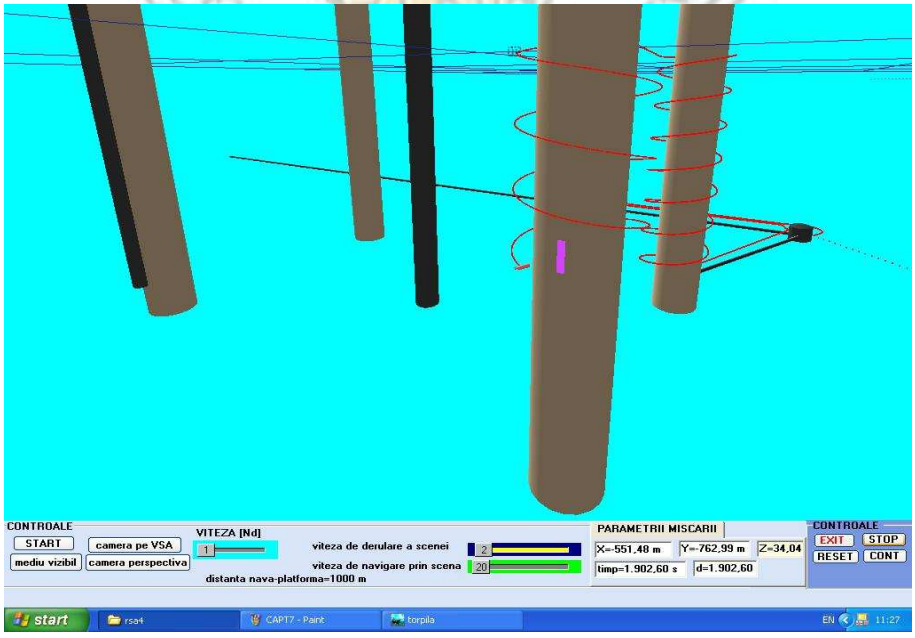

Fig. 3. Underwater surveillance and antiterrorist control at the offshore oil rigs

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