

EUROPEAN DIVING TRAINING CENTER (EDTC)

Nicușor CHIRIPUCI¹
Tamara STANCIU², Petru FLEȘER³

Rezumat: *Lucrarea prezintă propunerea pentru un proiect european de realizare a unui centru de pregătire a scafandrilor, pe baza unor reglementări și proceduri comune, în vederea atestării acestora pentru efectuarea unui spectru larg de activități de scufundare, în concordanță cu standardele europene, fiind adresat ariei civile și militare a statelor membre ale Uniunii Europene. Reprezentanții Centrului de Scafandri din Constanța, care prin Cursul de Formare, Pregătire și Antrenare Scafandri își exercită autoritatea națională în domeniul formării profesionale a scafandrilor și a autorizării activităților de scufundare, propun ca viitorul „Centru european de pregătire a scafandrilor” (EDTC) să se inițieze ca centru regional de formare profesională, cu nucleul la sediul Centrului de Scafandri, deoarece acesta deține deja o infrastructură specifică și personal calificat și cu experiență.*

Abstract: *The paper presents the proposal for a European project to develop a training center for diver, based on common regulations and procedures, in order to certify them for carrying out a wide range of diving activities in line with European standards, being addressed to the civil and military area of the Member States of the European Union. The representatives of the Diving Center in Constanta, who through the Diving Training Course exercise their national authority in the field of diving training and authorization of diving activities, propose that the forthcoming European Diving Training Center (EDTC) be initiated as regional training center, with its core at the Constanta Diving Center, as it already has a dedicated infrastructure and qualified and experienced staff.*

Keywords: European Center, Training, Diver, interoperability.

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1. Introduction

The project aims at providing facilities for the training of civilian and military divers from the public services of the Member States of the European Union on the basis of common standards recognized at European level.

The Diving Center subordinated to the Naval Forces Staff is proposed as the starting point for establishing a **European Diving Training Center (EDTC)**.

¹Cdr Eng., FPAS Course Manager, affiliation: Diving Center, Constanta, Romania, (email: nicusor.chiripuci@navy.ro)

²PhD Eng., Senior Researcher, affiliation: Diving Center, Constanta, Romania, (email: tamara.stanciu@navy.ro)

³Cpt. Eng., FS Laboratory Manager, affiliation: Diving Center, Constanta, Romania, (email: petre.fleser@navy.ro)

The Diving Center in Constanta is the structure by which the Ministry of National Defense exercises its specific competences in the field of training, patenting and improving the training of divers, as well as in the field of authorization and inspection of underwater activities. This institution has over 50 years of experience in preparing divers for different depth ranges or types of underwater work.

The Diving Center is the authorized structure on the territory of Romania for the activities listed below.

- Performing the patenting, attestation and qualification for the occupations and professions of the group "Divers".
- Performs the patenting, attestation and qualification for the occupations and professions of the group "Divers".
- Prepare, train and perfect divers.
- Forms and certifies technical staff to ensure diving and immersion work.
- Authorizes and inspect units performing underwater activities with divers.
- It performs the scientific research of medical and technological
- Engineering, for the realization of the technical means and improvement of the diving and working underwater.
- Ensures regular diversion of divers to reconfirm skills, habits and knowledge.
- Forms and certifies specialized medical personnel, according to the law.
- Recognizes the professional qualifications for the occupations and professions in the "Divers" Group, obtained by Romanian and foreign citizens in the countries of the European Union, the European Economic Area or in other states, in order to exercise these professions on the territory of Romania.

Other activities that the Diving Center can carry out are:

- search and recovery of materials, objects, flora / fauna or people in / from the aquatic environment;
 - execution of mechanical works, manually or with hydraulic, pneumatic or electric tools;
 - collecting and recording information related to underwater objectives, ie buildings, installations, ecosystems, bottom of water;
 - inspection of ships or submerged structures;
 - cleaning of immersed structures;
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- technical verification of submerged constructions, hydro mechanical and hydro technical equipment and installations;
- verification, control and demolition of immersed structures;
- execution of underwater construction works and assemblies;
- execution of replacements and locations of cables, rails and pipes with underwater trails;
- removal of obstacles, whether or not to land;
- controlul nedistructiv al structurilor imerse;
- welding and underwater cutting;
- refloating;
- rescue personnel from submarines, ships, cars, damaged aircraft and partially or wholly submerged;
- demolition or destruction of explosives;
- sealing, waterproofing hydropower groups, dams, locks;
- research and underwater archeology;
- operations for military purposes.

The Diving Training Course is the structure of the Diving Center, responsible for organizing professional training courses for divers, both military and civilian. Its organizational structure was conceived as a flexible and efficient structure, oriented to the current needs and requirements of professional training of divers, which will lead to the fulfilment of the standards and the levels of performance provided by the regulations in force and includes **executive structures** with attributions, clear, area-based tasks and responsibilities that allow for the organization and deployment, in different locations, of the training courses, in accordance with the specificity and complexity of the performance objectives, as well as a planning, evidence and support for **execution structures**.

Training programs for civilian divers are authorized by government authorities and their graduates can practice in any Member State under Directive 2005/36 / EC of the European Parliament and the Council. [1]

A feasibility study is under way to build a multi-purpose diving complex that includes a swimming pool and a 25 meter deep dive tower, as well as a process of upgrading the Hyperbaric Laboratory facilities.

2. The opportunity to approach the project

Recent events in the Black Sea area have dramatically changed the need for security. The wars in Georgia in 2008, the intervention in Ukraine with the illegal annexation of the Crimean peninsula by the Russian Federation, are fundamental changes. They are also joined by hybrid warfare, cyber attacks, arms trafficking, illegal persons and substances, and illegal migration. Here is a mixture of old and

new dangers that prove to be extremely dangerous. The analyzes show Russia's increased interest in the militarization of the Black Sea area, and whoever controls the southeast of Europe can project its force to the central area. The West is not ready for large-scale action in the Black Sea, but the Russians are. [2]

In light of recent events and the current geopolitical context, the Black Sea region is proving to be crucial for regional and Euro - Atlantic security. The Black Sea Coast is about 4000 km long, distributed between six countries, such as Turkey 34%, Ukraine 19%, Russia 20%, Georgia 14%, Bulgaria 7% and Romania 6% (after the Crimean Peninsula annexation). [3]

At the same time, Romania is making the transition to the Balkans and the Balkans are a very complicated region in terms of security, being a region where integration processes have not been completed, where ethnic, economic and geopolitical differences, based on an old history, persist.

The Ministry of National Defense has recently begun to acquire weapons, military drills, and international military initiatives. The establishment of multinational groups on the territory of Romania is a strategic priority of Romania. It is obvious that investing in human staff can be seen as an investment in the security of the Black Sea area and the eastern border of the European Union. [4]

The European Diving Training Center will focus the expertise of the Member States of the European Union and will thus experience, validate and standardize the training procedures based on the experience of the states wishing to participate in the program. The establishment of such a center will help to harmonize the specific procedures and doctrines of the Member States of the European Union.

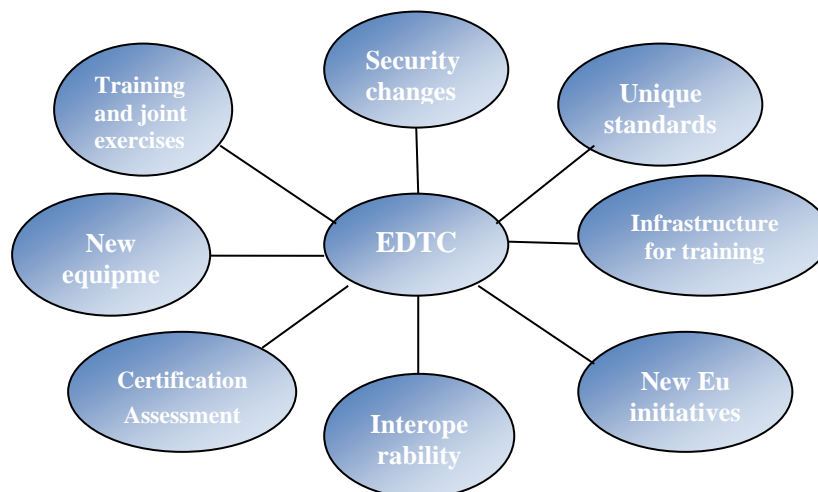


Figure 1 Joint Training - Improved Interoperability - Increased Security

The European Diving Training Center could play a major role at the regional level in enhancing the interoperability of forces by organizing joint exercises in a tactical environment very close to reality, taking into account the threats of the area.

In the first phase, the existing resources and infrastructure of the Diving Center will be used. In the next phase, the infrastructure should be extended on the basis of the allocation of resources from the funds of the EU Member States.

The European Diving Training Center will be integrated into the structure of the Diving Center, strategically positioned in the port city of Constanta, benefiting from its entire infrastructure, its legal framework, its experience and expertise.

In addition to providing long-term training facilities for beneficiary countries based on common standards, the establishment of the European Diving Training Center will generate security in this part of Europe, contributing to an increased level of professionalism and specialization on the line military and public services. Moreover, this training center can be used as a platform for complex multinational exercises that can be organized in this part of Europe.

3. The importance of the project

The importance of the European Diving Training Center results from:

- Generating a wide range of divers training through approved courses for EU Member States, graduates being free to practice this profession in accordance with Directive 2005/36 / EC of the European Parliament and the European Council.
 - Centralized specific training, reduction of allocated funds independently and limitation of the duplication of expenditure by the Member States participating in the project.
 - Improve, harmonize and standardize qualifications in Europe, in line with concepts and training standards.
 - Harmonize specific procedures and doctrines among EU Member States and NATO.
 - Ensuring an innovative spirit in the training of divers.
 - Implementation of standards for the preparation of diving and underwater procedures in the European Union by pooling structures and forces.
 - Use of the current legislative framework through which the Ministry of National Defence is the national authority for the certification of civil and military divers.
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- Ensuring facilities, qualified staff and training environment for joint instruction of divers of different nationalities.
- Developing new standards and procedures, as well as improving existing ones, in line with the latest developments in the field.
- Increasing inter-operability in peacetime.
- The ability of partners to participate more easily in joint missions.
- Enhancing the presence of NATO in areas in the south-eastern flank of the EU.
- Increased responsiveness of multinational, military and civilian forces.
- Creating the premises for the modernization of capabilities and national infrastructure.
- Infrastructure development - a regional training center is already positioned in the area.
- Cohesion development for areas where capabilities are limited.

4. Organization of the European Training Center for Divers – EDTC

EDTC will organize courses and certification programs for autonomous divers, deep-sea divers and rescue divers, intended for personnel who fit structures belonging to the Land Forces, Naval Forces, Air Force, Coast Guard, Police, Fire Brigade and Emergency Services of the Member States. (see Fig.2)

EDTC will create an institutional infrastructure to generate a "complete diver", mind, body and soul, with the skills required to perform underwater missions.

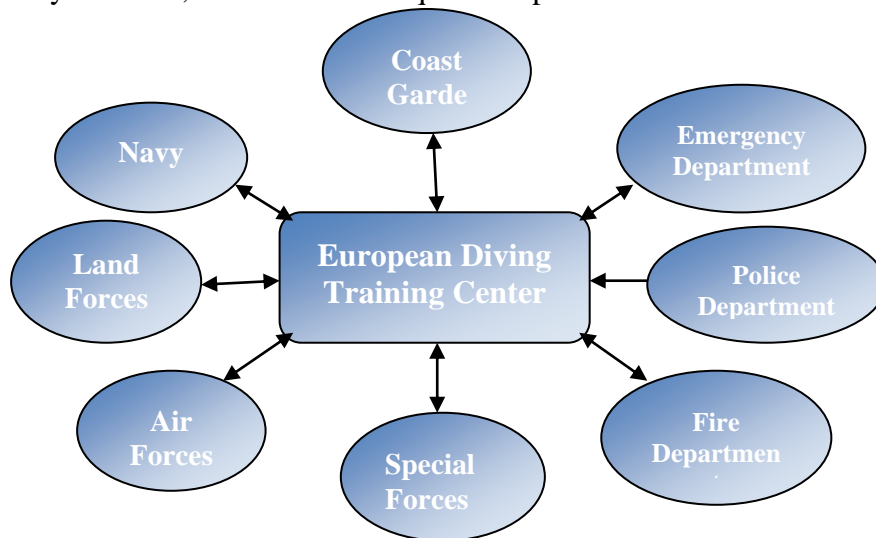


Figure 2 Interaction of the European Diving Training Center with the armed forces and public services

EDTC will organize courses from basics to ultra-specialization for autonomous divers, surface divers, deep-sea divers, assistant life support technicians and chamber operating, for both civil and military divers.

The EDTC project will be modelled in coordination with the EU Member States that need divers training.

Training programs will be authorized by governmental authorities, gradually, obtaining qualifications and certifications with automatic recognition on the territory of the European Union, in accordance with the European Directive 2005/26 / EC.

The intention is to launch invitations to all Member States to participate in this project, especially those willing and able to support the initiative, to give value to contributions to the project.

Taking into account that diving activities present a high risk in Romania as well as in other EU states, there are special legislative stipulations on these activities.

According to the national regulations in force, the Diving Center is the structure by which the Ministry of National Defence exercises the specific competencies of the national authority in the field of training, patenting and improving the training of divers.

The Diving Center is authorized by the National Authority for Qualifications as a provider of professional training for divers and underwater workers, as well as for diving technicians, respectively supervisor, assistant life support technician, chamber operating, through qualification courses /initiation /refinement / specialization.

As a result, following the implementation of common European standards and having the European and national legislative framework of the National Defence Ministry and the Diving Center [5], the ETDC will provide training for the different types of diversification specialization in accordance with these common European standards. At the same time, it will contribute to the unitary effort to ensure the security of the European area and to develop the defence capabilities of the European Union.

The national and EU benefits generated by the project are:

- Harmonize specific standards between EU members.
 - Ensure a common level of training, in line with common European standards.
 - Increasing the ability of Member States to act in a coherent and effective way to achieve their objectives.
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- Achieving a wide range of preparedness requirements for diving operations.
- Provide a framework for the training and evaluation of forces participating in various European missions and exercises.
- Training in a strategic / operational / tactical framework.
- Increasing the working efficiency of the forces involved.
- Improving the cohesion of the Member States.
- Involve Member States in taking initiatives and improving the program.
- Contributing to the development of the host nation's infrastructure.
- Facilitate lowering the cost of training, using the existing host nation's infrastructure.

5. Basic principles and objectives of the European Diving Training Center – EDTC

The efficiency of EDTC is based on the following principles:

- *Reciprocity and Transparency* - Medium-term agreement on the objectives and correlation between the training methods planned by the States concerned over a five-year period.
 - *Multinational approach* - driving these exercises with multinational involvement.
 - *Interoperability* - providing a prerequisite for the participation of EU Member States.
 - *Volunteering* - Member States can only send staff on a voluntary basis.
 - *Continuity* - guaranteeing training programs.
 - *Flexibility* - so they can fit on the timetable of European or NATO missions.
 - *Transparency* and "open door" policy - for the participation of interested members and nations.
 - *Access to funds* – participating nations have the right to access Community funds to improve the infrastructure and material base.
- The key objectives of the Multinational Center are:
- providing a common training framework for European divers;
 - providing technical training, certified programs and training for civil and military personnel;
 - providing the framework for joint training of divers of different nationalities;
 - increasing cohesion and immediate action;
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- enhancing effective interoperability and support capacity;
- deploying EDTC on the host nation's infrastructure, focusing on Black Sea specifics and conditions.

6. Overview of the European Diving Training Center – EDTC

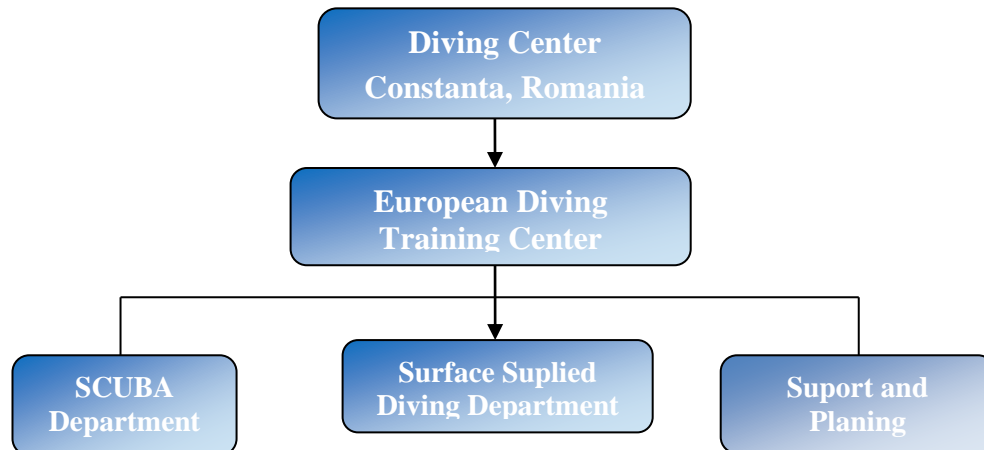


Figure 3 Organization of the European Diving Training Center

The European Diving Training Center will be organized within the Diving Center structure and will provide facilities, equipment and staff for training and certification for a wide range of qualifications and specializations. The Diving Center in Constanta can provide the following courses:

Table 1 Courses in the European Diving Training Center

<i>Basic courses</i>	<i>Duration (Weeks)</i>	<i>Number of participants / course</i>	<i>Courses / year</i>	<i>Graduates / year</i>
Scuba Diver	8	16	3	48
Surface Supplied Diver	12	8	2	16
Salvage Diver	16	8	2	16
Supervisor Diver	3	12	1	12
Chamber Operator	3	12	1	12
Assistant life support technician	3	12	1	12

The activities of the Diving Center courses in Constanta and the capabilities offered are structured in Table 2.

Table 2 Activities and capabilities of Dedicated Training, Training and Training Course [6]

<i>Diver</i>	<i>Presentation</i>	<i>Capabilities</i>
SCUBA Diver	Trained for SCUBA, has minimum qualifications to protect the force in the marine environment, performs simple searches, works and maintenance.	SCUBA diving with compressed air at depths of minimum 15msw and maximum 40msw in day / night conditions. Performs: <ul style="list-style-type: none"> • diving training; • simple search operations and recovery of objects in the underwater environment; • technical inspections and hull repair on ships; • live shipwreck cleaning, including simple maintenance operations.
Deep sea diver	Trained to be able to evolve and work underwater with the help of specific equipment supplied and assisted by a surface team.	Compressed air diving activities, delivered through the umbilical to the depth of 40 msw, in day / night conditions. Performs limited: <ul style="list-style-type: none"> • diving training; • search operations and recovery of objects in the underwater environment; • underwater research; • collecting and recording information related to various objectives; • technical inspections and hull repair on ships.
Surface Supplied Diver	Trained for SCUBA or surface supplying to perform various tasks such as: moving or anchoring objects underwater, support (search, penetration, military search, obstacle location, destruction, cleansing of seaports, construction and repair, safety, search and rescue).	Diving with SCUBA or surface supplying at depths of minimum 15msw and maximum 60msw under day / night conditions. Performs: <ul style="list-style-type: none"> • diving for training, real or in simulators and hyperbaric chambers; • search operations and recovery of objects and people in the underwater environment; • underwater research; • collecting and recording information related to various objectives; • underwater works with hydraulic and pneumatic tools; • welding, underwater cutting, non-destructive control immersion structures; • demolitions with explosives.
Salvage Diver	Trained to be able to evolve and work underwater with the help of specific equipment for support, rescue, evacuation and recovery operations of allied or enemy forces: ships, craft,	Diving activities at depths over 60 msw with surface supplied or diving unit in day / night conditions. Performs underwater work included but not limited to: <ul style="list-style-type: none"> • diving for training, real or in simulators and hyperbaric chambers; • search operations and recovery of objects and people in the underwater environment;

	equipment for reuse, repair operations.	<ul style="list-style-type: none"> • underwater research; • collecting and recording information related to various objectives; • underwater works with hydraulic and pneumatic tools; • welding, underwater cutting, non-destructive control immersion structures; • demolitions with explosives; • complex inspections, including wreck inspections; • complex maintenance operations.
Supervisor	Trained to organize and conduct diving activities.	<p>The supervisor is directly responsible for the execution of diving and underwater work.</p> <p>Performs:</p> <ul style="list-style-type: none"> • diving planning; • processing of health and safety regulations at work; • checking the apparatus, the specific equipment and the necessary materials; • preparing hyperbaric chamber and craft intervention and diving security; • the use of air tables and mixing breathing tables, as well as successive diving tables; • the use of therapeutic treatment tables for diving accidents.
Chamber operator	Trained to conduct work with the hyperbaric chamber and is responsible for the proper functioning of its interior and exterior installations.	<p>Chamber operator subordinates to the supervisor during the dive.</p> <p>Performs:</p> <ul style="list-style-type: none"> • maintaining the physical parameters of the chamber ambiance; • knowledge of diving procedures in detail; • remedierea oricăror defecțiuni apărute în barocameră; • maintenance of the hyperbaric chamber after the end of activities; • maneuvers with chamber transfer out lock; • the use of therapeutic treatment tables for diving accidents; • coordination of soda lime from the filters for the regeneration of hyperbaric enclosures.
Assistant life support technician	Trained to service and exploit installations in the diving ensemble (compressors, suppressors, diesel generator sets, boilers, cooling plants, respiratory mix regeneration, and gas storage).	<p>Assistant life support technician subordinates to the supervisor during the dive.</p> <p>Performs:</p> <ul style="list-style-type: none"> • monitors the correct operation of the compressors; • breathing gas maneuvers and breathing air recovery; • starting the diesel – generator group; • periodic change of soda lime and active coal; • troubleshooting.

The Diving Training Course has besides classrooms, authorized and experienced trainers and valuable didactic material. The team of the Diving Center, in

collaboration with university teachers, has developed its own manuals for internal use, but also indexed books in the National Library database dedicated to the theoretical training of military and civilian divers.

„Diving Technologies”, „The Diver’s Manual”, „Hiperbaric Technologies for Saturation and Unit Diving”, „Underwater work done with divers”, „Underwater breathing apparatus”, „Physics Exercises for Diving Training”.

The center is equipped with a Hyperbaric Laboratory in collaboration with COMEX Industries (2 dry chests Ø2300 and a wet simulator), which is now being refurbished.

7. Budget estimate of the European Diving Training Center

On the already existing infrastructure of the Diving Center in Constanta, the operations listed in Table 3 must be performed. The feasibility study for building a swimming pool, with its location in the Center, is done.

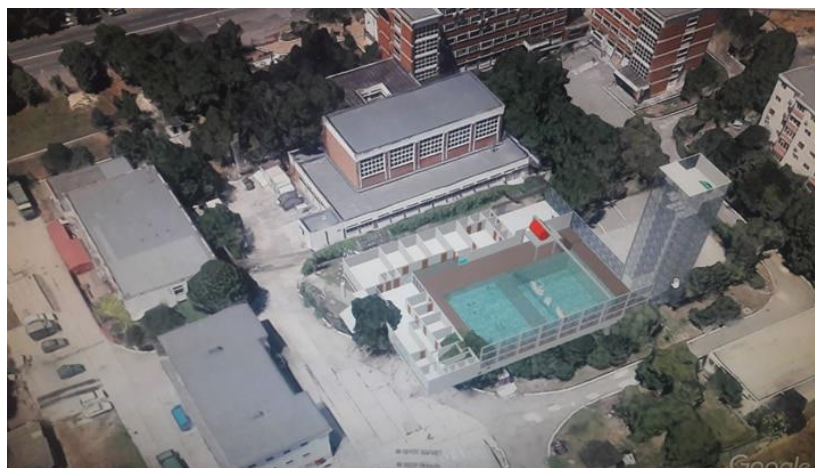


Figure 4 Placing the swimming pool [7]

Table 3 Estimated costs for the establishment of the European Diving Training Center

<i>Objective</i>	<i>Estimated cost (EURO)</i>
Construction of a swimming pool	3.000.000 Eu
Modernating of Hyperbaric Laboratory	8.000.000 Eu
Modernating / Construction of accommodation	500.000 Eu
Endowments with diving multifunctional ship	2.000.000 Eu
Endowments with boats	250.000 Eu
Endowments with diving equipment	1.000.000 Eu

Endowments with transport vehicles	250.000 Eu
Total estimated costs	15.000.000 Eu

8. Conclusions

The main role in the implementation of this program lies with the Ministry of National Defense of Romania. The training program and selected facilities in Romania will play an important role in enabling the proposed program to be implemented.

The education and training system will be made available to personnel belonging to the armed forces and the civil service of the Member States of the European Union.

It is our intention to invite all Member States, able to support the initiative and to contribute with the experience in the field, adding prestige and contribution. Romania will provide logistical and legislative support, and any kind of participation from the member states is welcome.

The project is in the concept stage, with long-term and very long-term objectives. The development of an implementation plan will be initiated by mutual agreement with the states that will express their intention to participate in this project.

Romania, as a nation with infrastructure already in the area of interest, will coordinate the implementation of the project.

REFERENCES

- [1] European Parliament, 2005/36/EC *European Directive*, <http://eur-lex.europa.eu> (March 2005).
 - [2] Al.Grumbaz, article: *Turcia, Crimeea rusă și Marea Neagră*, <http://adev.ro/pbd16c> (August 2014).
 - [3] *Itinerarii pontice - Marea Neagră*, <http://ecomareaneagra.wordpress.com> (July 2015).
 - [4] G. Vișan., article: *O forță Navală NATO în Marea Neagră?*, <http://civitaspolitics.org.ro> (January 2016).
 - [5] *Norme privind pregătirea, organizarea și protecția muncii în activitatea de scufundare*, Romanian Navy (Bucharest, Romania, 1996).
 - [6] *Description of occupations*, Diving Center (2018).
 - [7] *Photo Archiver*, Diving Center
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