



South-Eastern Europe Mine Action Coordination Council

STANDARD OPERATING PROCEDURES FOR HUMANITARIAN UNDERWATER DEMINING IN SOUTH EASTERN EUROPE



Bijela, 2004

SUMMARY

| | | |
|-----|--|----|
| 1. | PREFACE | 3 |
| 2. | INTRODUCTION | 3 |
| 3. | GOAL | 4 |
| 4. | SCOPE | 4 |
| 5. | CONCEPTS AND EXPLANATIONS | 4 |
| 6. | CONDITIONS FOR HUMANITARIAN UNDERWATER DEMINING ACCREDITATION (HUD) | 5 |
| 7. | USE OF DIVERS FOR DESTRUCTION AND CLEARANCE OF UNDERWATER MINES AND UXO | 5 |
| 8. | SECURITY MEASURES IN HUD DIVERS WORK | 6 |
| 9. | COORDINATION AND CONTROL | 6 |
| 10. | MONITORING OF DEMINED BOTTOM | 6 |
| 11. | LOGING AND REPORTING | 7 |
| 12. | TRAINING OF DIVERS FOR HUD | 7 |
| 13. | TESTING PROCEDURES AND KNOWLEDGE EVALUATION OF DIVERS FOR ADMISSIONA TO HUD COURSE | 8 |
| 14. | HUD METHODS AND PROCEDURES IN ALL WATERS | 8 |
| 15. | DIVING RULES FOR HUD | 10 |
| 16. | INTRODUCTION | 11 |
| 17. | DIVING DEFINITION OF HUD | 12 |
| 18. | DIVING CLASSIFICATION | 12 |
| 19. | DIVING EQUIPMENT AND MEANS | 13 |
| 20. | DIVING VESSELS | 14 |
| 21. | DIVERS CLASSIFICATION | 14 |
| 22. | DIVING ORGANISATION FOR HUD | 14 |
| 23. | DIVING DIRECTION | 14 |
| 24. | HUD DIVING PREFORMANCE | 17 |
| 25. | COMMON SAFETY MEASURES | 18 |
| 26. | PARTICULAR SAFETY MEASURES | 19 |
| 27. | UNDERWATER PROCEDURES IN A CASE OF AN ACCIDENT | 21 |
| 28. | UNDERWATER MEDICINE | 21 |
| 29. | UNDERWATER ACCIDENT INVESTIGATION | 25 |
| 30. | INHALING MEDIUM AND ABSORBITION OF SUBSTANCES | 27 |

PREFACE

With the strategy of development of the South Eastern Europe Mine Action Coordination Council (hereinafter referred to as SEEMACC) it was established the need to develop Standard Operating Procedures for Humanitarian Underwater Demining (hereinafter referred to as SOP HUD), based on experiences in decontamination of sea, lake and river bottom from mine and other UXO remnants from First and Second World War and other conflicts in SE Europe.

Regional center for divers training in underwater demining (hereinafter referred to as RCUD), on the initiative from SEEMACC, with joined activities of the workgroup formed on SEEMACC proposal, have adapted relevant International diving regulations for SOP HUD, that will contribute to:

- INCREASE THE SAFETY IN REALIZATION OF UNDERWATER DEMINING
- EFFICIENT CLEARANCE OF MINE AND UXO
- PROTECTION OF INTEREST OF THE ORGANIZATIONS ACCREDITED FOR HUMANITARIAN UNDERWATER DEMINING

- Beside operating procedures for HUD, this standards brings important principles of application of the International diving regulations and instructions for HUD and training of divers for HUD, as well as Diving Rules for HUD.

Standard has a feature of guide that will, after the adoption by SEEMACC, be the base for the synchronization of the *Standard Operating Procedures for Humanitarian Underwater Demining* in the region of SE Europe (SEEMACC) with aim to improve safety and efficiency of underwater demining, to establish principles, to define certain and established methods of HUD performance and establish requirements and specifications. SOP, also has to provide framework of recommendations and requests for HUD programs and projects, to promote simplicity and harmonization of HUD organization, to realize programmed levels of efficiency and safety, taking in consideration local conditions and circumstances.

INTRODUCTION

Regional center for divers training and underwater demining, examining the rules and regulations of international diving schools and the conclusions of SEEMACC based on the strategy of development, through the activities of the workgroup on the formulation of SOP for HUD, have estimated the following:

1. Performance of HUD in organization by legal entities in possession of permission for HUD and registration certificate issued by competent Governmental office, creates prerequisites for safe HUD diving, under expert and qualified guidance (authorised dive chief) with respect of all the safety measures and obligatory possession of the equipment for first aid in case of diving incident.
2. The practice shows that the bottom contaminated with mines and other UXO represent the problem for almost all countries in SE Europe. In certain countries, untrained divers that performed underwater mine and UXO clearance have become victims of ignorance and incompetent underwater handling of this means.
3. Divers trained for HUD in RCUD have become known with their efficiency and knowledge through their underwater demining actions for solving problems of underwater mine in SEE region, because only by use of trained divers, the detection and clearance of underwater mines is possible in waters, regardless if it is sea, lake, river, canals or other water surfaces.

Advantages of the use of trained divers for HUD are the following:

- a) Expert underwater exploring of the hazardous area, contaminated with mines or other UXO,
- b) Expert performing of HUD activities,
- c) Performing of hidrological-topographical charting, systematic exploration of the field, performing of underwater minefield hazard marking,

- d) Protection of the population from underwater mines and other UXO,
- e) Support and development of international HUD cooperation,
- f) Compilation of HPD analysis, reports and informations,
- g) Proposal of HPD regulations,
- h) HUD sampling and quality control.

GOALS

This standard have the following goals:

- a) Uniformization of demands and criteria for divers training and execution of HUD,
- b) Standardization of the divers use in HUD process,
- c) Assurance of the quality of the technical underwater exploration and the clearance of the bottom from mines and other UXO,
- d) To establish certain level of confidence with the end user for clearance of the bottom from mines and other UXO by use of divers,
- e) To direct the development of use of divers in HPD.

SCOPE

This document includes:

Standard operating procedures for humanitarian underwater demining that regulates:

- conditions for obtaining the accreditation for HUD regarding HUD organizations;
- to keep HUD organizations under control and coordination
- divers training and education for humanitarian underwater demining;
- licencing of divers and instructors for HUD
- risk analysis and safety measures
- HUD methods and procedures in all waters.

HUD Diving rules that define:

- classification of diving;
- equipment and means for diving;
- diving management;
- performance of diving;
- common and specific security measures;
- underwater procedure in case of incident;
- medical examination;
- transport of injured or ill diver;
- diving hygiene;
- medical equipment and means for diving provision in waters remote to medical institutions.

CONCEPTS AND EXPLANATIONS

HUD Organization: humanitarian underwater demining organization with the status of legal entity, that on base of fulfilled conditions have received the appropriate certificate to perform and organize HUD diving.

Active status: Diver that have diving chief or instructor certificate, the liability insurance toward third persons and working licence have the active status.

Dive Control Specialist (DiveCon), P3 or P4: Diver that complies with conditions for Dive chief or for Instructor Asistent, certified by international diving school.

Dive chief: Dive chief is a diver that has a Dive Control Specialist, P3, P4 or Diving instructor certificate.

Certificated Instructor Diving Trainer: Diver that holds certificate – brevet with highest degree for diver training by international diving school standards.

Underwater countermining technical reconnaissance: consider of underwater searching, performed by divers using Geophysical Information System (GFIS) with target of discover of mines and other UXO in waters.

CHAPTER I

1. CONDITIONS FOR HUD ACCREDITATION

1.1. HUD accreditation is issued by national MAC on the territory where HUD is performed. For a HUD organization, on the territory where HUD operations are performed, to receive the accreditation, the following conditions apply:

- a) to dispose of own SOP with developed HUD procedures for use of divers in HUD operations, compliant with national and international HUD standards
- b) HUD organization must dispose of valid insurance from liability toward third persons, and their instructors must dispose of valid insurance from liability toward third persons as well.
- c) The organization, in the managing structure, must have a certified instructor diving trainer by the standards of international diving schools.
- d) Each diver hired in the HUD organization, must own a certificate about completed HUD course, issued by acknowledged HUD training school, and a diving certificate – brevet issued by an international diving school.
- e) HUD organization have to dispose of a program for divers training by the standards of international diving schools translated to the language of the country where operations are performed,
- f) To employ at least one active licenced diving instructor,
- g) To own business facilities on appropriate location with polygons for diver training and professional appearance in the area of origin.
- h) To use modern diving equipment and means for HUD, that is in good order.
- i) To own suitable compressors that provide air or breathing mixture of required quality.
- j) To own toolkit and first aid program, as well as plan of transportation of injured,
- k) To own means for diving location marking (buoy, flash light, diving flag),
- l) Phone numbers of decompression chambers must be posted on a visible place.
- m) Own all necessary authorisations and work permissions and comply to all positive regulations in the area of activity,
- n) That it is not under investigation and have not violated ethical principles or standards of international diving schools, in last 12 months,
- o) That it agrees with the application of international diving regulations and SOP for HUD.

1.2. For all above mentioned from conditions for HUD accreditation, responsible person representing HUD organisation is obligated to submit the following documentation with the request for accreditation to national MAC:

- Copy of registration certificate (excerpt from Court Register),
- List of instructors and diving chiefs, their work permits if they are strangers,
- Short description of basic technical properties of the HUD organisation, their organisation, location and their previous HUD results.

CHAPTER II

2. USE OF DIVERS FOR DESTRUCTION AND CLEARANCE OF UNDERWATER MINES AND UXO

2.1. Divers for HUD in purpose of population protection in countries of SEE affected by mine mine hazard, are used for the following activities:

a) UNDERWATER RECONNAISSANCE OF HAZARDOUS AREA

Underwater reconnaissance of hazardous areas by use of divers is a basic way to determine the degree of contamination of the bottom. This activity in technical reconnaissance consist of detail technical investigation of the hazardous area on the bottom. By use of video and photo technology, underwater filming of the bottom and with use of mine detectors, divers determine and mark the area of the bottom contaminated with mines and/or UXO.

Underwater reconnaissance of the hazardous area can be performed by maximum two divers simultaneously.

b) MARKING AFTER THE UNDERWATER EXPLORATION

After the bottom have been explored and the contamination with mines and/or UXO ascertained, it has to be confined with the marking ribbon that contains clearly posted warning sign about mine presence. Organisation dealing with maritime safety or use underwater resources on that location must be informed in the written form.

c) UNDERWATER DEMINING AND MINE/UXO CLEARANCE

Underwater demining, mine and UXO clearance from the bottom are performed by certified divers for HUD with the logistic support from divers on vessels or land, that do not have to be certified for HUD. Because of the high risk that antimine divers are exposed to, with the goal of underwater demining or mine/UXO clearance, there can be only one diver or in exceptional case two divers underwater.

CHAPTER III

SECURITY MEASURES IN HUD DIVERS WORK

3.1. Beside the security measures, stated by this Standard, for the work of divers, during the HUD operations, the HUD organisation must uphold the following security measures:

- a) For underwater demining there can be employed only those divers that own certificates about successful completion of HUD training issued by acknowledged and authorised institution for divers training in HUD.
- b) Organisation must dispose of suitable diving equipment and means for underwater demining and mine/UXO clearance from the bottom.
- c) Diving chief in the organisation for HUD is person responsible for development of the *Plan for antimine diving* approved by the director of the HUD organisation.
- d) Diving chief, according to *HUD Diving regulation*, must be present and supervise HUD keeping the log of all dives in *Dive log*.
- e) During the divers training for HUD, underwater exploration, demining or clearance of underwater mine or UXO, the presence of medical specialist for maritime or hyperbaric medicine and medical technician with medical vehicle and equipment is obligatory.

CHAPTER IV

COORDINATION AND CONTROL

4.1. Coordination of the use of divers in humanitarian underwater demining include coordination of all activities connected with the work inside the HUD organization and between other participants in the process (HUD organisation, national MAC, monitoring organisations etc.). The aims of the coordination is planned usage of the capacities of the HPD organization in underwater exploration, demining and mine / UXO clearance from the bottom and by the national MAC for advancement of work and usage of divers in demining process.

a) MONITORING OF DEMINED BOTTOM

- Monitoring or supervision of demined bottom is performed by HUD organisation on request of national MAC, as well as the donor, if he consider it is necessary.
- For monitoring or supervision of demined bottom HUD organisation must employ at least three diving instructors, licenced and certificated for HUD, by acknowledged and authorised institution for HUD divers training; at least one instructor must have the highest diving instructor category by the standards of mentioned international diving schools (i.e. Instructor Trainer by SSI or CMAS M3).

- During HUD works, HUD organization that monitors or supervise must provide at least one out of three named diving instructors that will be constantly present during HUD and compile reports about HUD divers daily activities.
- In final phase of HUD project realization all three named diving instructors must inspect demined bottom, compile the final report, sign it and deliver it to HUD organization, that will forward it to interested organizations.
- Reports about monitoring or supervision of demined bottom must be delivered to national MAC, HUD contract parties, as well as the donor that provided funds for HUD if report is requested.
- Report must contain precise data about work location on suitable map with enclosed video and photo records, regarding mines and UXO on the bottom before as well as video and photo records of the bottom after the demining.
- For monitoring or supervision of bottom demining, HUD organization must fulfill the following conditions:
 - to possess valid insurance from liability toward third persons;
 - to employ at least one instructor and to have work permits for other instructors if foreigners;
 - Diving instructors must own personal insurance or insurance from liability toward third persons.

b) LOGGING AND REPORTING

All HUD organizations in SE Europe countries have to be registered with national MAC-s.

Database for each HUD organization must contain: organization name, address, phone numbers and number of certified HUD divers.

Registration enables: to plan divers usage in the process of humanitarian underwater demining, to efficiently act in protection of population from underwater mines, to promptly inform about bottom mine contamination, to connect and share data about bottom mine contamination for compilation of statistical reports for the region and wider.

Reports about HUD organization activities on underwater exploration, demining and mine or UXO bottom clearance must be precise about working location with enclosed video and photo recording of the bottom before and after the demining.

CHAPTER V

TRAINING OF DIVERS FOR HUD

5.1. FORMS OF TRAINING OF DIVERS FOR HUD

Training is organized in form of course that last 17 working days.

5.2. PARTICIPANTS OF THE TRAINING FOR HUD

Participants of the training are divers of specialised agencies, non Governmental organizations (NGO), regional international organizations and other organizations dealing with disarming and disposal of mine and UXO in SE Europe and other countries interested in providing help in protection from UXO, trained for diving with autonomous diving equipment.

Participants must have the recommendation from national organization dealing with demining and protection of population from UXO. Recommendation must be delivered to RCUD in written form.

5.3. CONDITIONS FOR PARTICIPATION OF DIVERS IN TRAINING FOR HUD

Candidates interested for participation in the training for HUD must fulfill the following conditions:

- they must own the certificate – brevet about dive chief degree (DIVECON), diver with three stars or other diving degree equivalent to mentioned degree according to standards of the recognized international diving schools (SSI, CMAS, PADI, UDI, NAUI, CEDIP, PSS or INTD),
- they have completed the program of introductory and basic training for protection from UXO,
- they have a medical certificate not older than one year,

- they have passed diving test according to determined standards, and
- they have signed the declaration about accepting the responsibility and risks.

CHAPTER VI

TESTING PROCEDURES AND KNOWLEDGE EVALUATION OF DIVERS FOR ADMISSION TO HUD COURSE

6.1. Teachers and instructors are obligated to present to course participants at the beginning of their lectures and training the following: purpose and goals of training, Program of divers training in humanitarian underwater demining and protection from UXO, criteria for psycho-physical evaluation for admission to course, as well as criteria of knowledge test for final exams.

6.2. Each candidate – diver, before the beginning of course, and after the presentation of purpose and goals of training, have to sign the *Declaration of acceptance of responsibility and risks*.

6.3. At the beginning of the training Program, RCUD director will form a three member board, consisting of teachers, that will evaluate medical certificates for diving ability not older than one year and that candidate fulfill the conditions for admission to training program according to criterion determined for successful completion of *Diving test*, as follows:

- free swimming with ABC equipment to 300 meters on surface, maximal time 9 minutes,
- diving in apnea to 10 meters of depth with emptying of mask and snorkel,
- swimming with ABC, breathing with snorkel, without mask, on surface without interruption, for 3 minutes,
- running to 1000 meters, maximum 7 minutes,
- at least 40 non-interrupted push-ups,
- at least 30 non-interrupted abdominals.

6.4. Knowledge test is performed in front of three member board, named by the RCUD director, during the course preparation, consisting of teachers and course organizers.

6.5. Knowledge test, during and at the end of course, consist of:

- regular testing, performed during practical training; candidate must be 100% efficient during execution of all elements of the practical exercise; on the contrary, at instructor recommendation and with confirmation of the board, candidate can not continue the training and fail the course.
- Final exam of the practical knowledge: participants in individual groups present their project and perform the practical exercise according to project. Practical knowledge of individuals and team work of candidates will be evaluated at presentation.
- Final exam of the theoretical knowledge: participants will do the written test, consisting of 100 questions with offered answers, of which only one will be exact. At the end of written test, each participant review the answers with examining board, correcting the eventual errors. Participants must have at least 85% of correct answers to fulfill the requirements and pass the exam.

6.6. Knowledge test under b) and c) will be performed before a three member board.

6.7. Knowledge test is graded with dichotom marking scale: "successful" and "unsuccessful".

6.8. Participant that does not finish the theoretical knowledge test can repeat the test in 30 days. If the candidate fails the second test, the test can not be repeated. Candidate that failed the test of practical knowledge, can not take the test of theoretical knowledge.

GLAVA VII

HUD METHODS AND PROCEDURES IN ALL WATERS

7.1. Searching through the terrain and aquatorium for UXO can be performed by divers using many methods, based on Geophysical informative systems (GFIS).

7.2. Searching for UXO is undertaken with aim to find UXO and classification of UXO, to be demined with target of population protection from UXO

7.3. In purpose of successful searching performance for UXO and demining, divers have to be trained for the following actions:

- Marking the area where the searching is performed
- Searching through the marked area
- Underwater disarming of UXO

- Dragging of the mine from waterway or aquatorium in which it represent danger
- Destruction of UXO

7.4. With searching for UXO, following facts about UXO has to be collected:

- Kind and type of the UXO
- Quantity of explosive charge
- Kind of detonating equipment of UXO
- Position of UXO in water
- Age of UXO
- photo of UXO

7.5. Underwater searching, performed by divers, in aim of identification and marking of area contaminated with UXO, can be done:

- trough marked areas – stripes
- trough not marked areas – stripes

7.6. Demining can be undertaken with aim to destroy UXO, as follows:

- destroying the UXO on the position where it was found
- disarming of UXO
- recovery and dragging (with “divers parachute”)
- dragging by ships (boats)

7.7. Underwater destroying of UXO can be performed only in situations when particular conditions are fulfilled and it can not be removed in other way. In case of underwater destroying of UXO all the measures from approved SOP has to be applied, particularly protection measures according to the safety areas.

7.8. Underwater disarming (neutralization) of UXO can be realized with disabling the UXO to explode, i.e. to remove detonator (exploder) and initial charge. Number of divers working on underwater disarming is strictly limited on the minimum. Protection measures from shock wave of underwater explosion and effect of explosion fragments have to be undertaken, as well as level of noise has to be restricted on maximum 65 db. Area has to be protected and population in the surrounding has to be informed. Diver – operator works on disarming, according to the instruction for certain kind of UXO, using special tools and equipment, without electro-magnetic influence.

7.9. Recovery and extracting the UXO from water bottom is performed by “divers parachute”. If possible, lifting has to be done from distance and 30 minutes after lifting UXO can be towed till the place for recovery, which is distant at least 1000 m from the habitable building, heavy traffic etc.

Taking photos and filming of UXO should be performed from distance, of minimum from 3 m.

7.10. Transport to the polygon for destruction has to be performed according to the legal regulation regarding transportation of the explosive. Destroying is performed by detonation on approved polygon.

DIVING RULES
FOR
HUMANITARIAN UNDERWATER DEMINING



Introduction

The diving rule for humanitarian underwater demining have for target the experiences and up to now knowledge on the diving field, underwater medicine and certain technical rules for some type of the diving equipment.

The rule includes the dive and diving equipment classification, diver's classification, the basic dive principles for humanitarian underwater demining, diving in all types of diving equipment, diving documents, general and particular measures of the security, underwater medicine and inspiring medium and substances absorption.

The Rule's goal is to provide the sole planning, to do diving humanitarian underwater demining tasks safely and effectively.

The Rule intends for diving instructors and diving directors, as well as for directors of the organizations that make a decision on the diving plan and on use of divers in humanitarian underwater demining and it is a required document.

The Rule can use as a diving textbook.

**DIVING RULE
FOR
HUMANITARIAN UNDERWATER DEMINING**

CHAPTER I

GENERAL DECREE

1. DIVING DEFINITION OF THE HUMANITARIAN UNDERWATER DEMINING

1.1 Diving for the humanitarian underwater demining (hereinafter referred to as: HUD), according to this Rule, means the performance of the restricted tasks under water. Divers of some specific agencies, NGO`s, regional international organizations and others ones engaging in disarmament and mines and UXO destroying in the SE Europe area and other countries interested in providing assistance and civil protection against UXO, perform them. They train in scuba diving suit (dive with independent diving equipment).

1.2 HUD diving can perform in stagnant and running water (sea, river, lake, swamps, canals, sewerage and drainage systems, pools).

1.3 Diving starts in the moment when the diver in scuba equipment immerse in water to perform his task, and it finishes in the moment in which the divers exits from the water, that is, in the moment in which diver starts to inhale atmospheric air.

CHAPTER II

DIVING CLASSIFICATION

2.1. The scuba diving is divided by type of equipment used in HUD diving into:

1. Dive with open circuit
2. Dive with close circuit,
3. Dive with semi close circuit apparatus.

2.2 The scuba diving is divided by type of inhaling substances used in HUD diving into:

1. Dive with compressed air,
2. Dive with the pure oxygen,
3. Dive with artificial gas mixtures.

2.3. The scuba diving is divided by specific purpose into:

1. Dives in training divers for HUD and
2. Minefield investigation dives.

2.4. Dives training for HUD consists in skilled diving and tactical HUD training. These dives are performed in according with specific curriculum and program.

2.5. Minefield investigation dives consist in diving tasks performances for HUD to investigate mine contaminated water bottom, underwater demining or mine and UXO clearance and destroying from the water bottom.

2.6. The organization performing these HUD dives coordinates its diving plans in accordance with HUD Standard Operating Procedure (SOP).

2.7. Suitable for conditions impeding or facilitating dive performance for HUD, we have:

1. Dive in favorable conditions
2. Dive in unfavorable conditions and
3. Dive in hard conditions.

2.8. There are many factors making difficult or facilitating dive conditions for HUD. It is the diving time, water transparence, bottom visibility, water temperature, diving depth, ice, wind and wave conditions, strength of current, pollution, reliable diving equipment, security possibilities, etc.

The harder condition requires more psychophysical concentration and advanced training category.

2.9. Favorable diving conditions are following: daily dive to 40 m. depth, visibility in water more than 2 m, temperature over 12⁰C, no bacteriological, chemical or radiology contamination, strength of waves to 2 Beaufort and current strength to 0, 6 knots

2.10. Dive in unfavorable diving conditions means:

- To dive at night under favorable conditions
- To dive during the day on 30-40 m depth,
- To dive during the day in water transparence from 0, 5-2m.,
- To dive during the day in temperature from 8-12 0C,
- To dive during the day in the state of waves from 2-4
- To dive during the day in current strength from 0, 6-0, 8 knots
- To dive during the day in bacteriological or chemical contaminated water
- To dive without direct security, disregarding other conditions,
- To dive in blue.

2.11. Dive in hard conditions means:

- To dive at night when the other diving conditions are very hard
- To dive during the day on more than 40 m depth
- To dive during the day when the water transparence is less than 0, 5m,
- To dive at night when it is no possible to provide direct security
- To dive during the day in water temperature under 6⁰C,
- To dive during the day in state of waves more than 4,
- To dive during the day in current intensity over 0, 8 knots
- To dive beneath the ice
- To dive to rescue human lives.

2.12. Regardless diving category, it is prohibited to dive in the following conditions:

- In the current over 3 knots(5,5km/h),
- In the state of waves and wind when the diving boat is not enable to enable to the diver safe immersion and exit.
- In the state of sea over 4, if a decompression in water is foreseeing at the diving site,
- In water temperature less than 3⁰C in wet suit,
- If the ice is moving
- If the visibility caused by fog and rain on surface is less than 5 m.

CHAPTER III

DIVING EQUIPMENT AND MEANS

3.1. The diving equipment is an integrated system that enables completely safe diving and tasks performance under water for HUD.

3.2. To perform tasks in water, the HUD organization diver uses the light diving equipment (hereinafter referred to as: LIDE) with diving apparatus according to article 3 of this Rule.

LIDE consists: diving apparatus, diving suit, mask and snorkel; fin; weight belt; diving jacket(Buoyancy Compensator); diving watch; depth gauge, decompression meter; diving compass, diving knife; underwater lamp; marking buoy.

The leader of diving group/team orders a minimum of LIDE for a fixed dive.

3.3. The diving means consist of: diving compressors, pumps for gas pouring; air and pure gas banks for diving; decompression chamber; apparatus for oxygen inhalation on the surface; apparatus for oxygen reemersion; diving vessel; underwater communication means; diving PEL; camera and video - camera for underwater filming; underwater metal and explosive detectors; underwater writing boards.

CHAPTER IV

DIVING VESSELS

4.1. Diving vessels, according to this Rule, are boats made for providing a better performance of the diving tasks for HUD, specially equipped in technique and staff.

4.2. A diving boat must equip minimum: diving compressor, air bank; decompression chamber; appropriate first aid.

CHAPTER V

DIVERS` CLASSIFICATION

5.1. According to their training skills, certified HUD divers within HUD organizations are divided into:

- Divers – dive leaders with the lowest category DIVECON per SSI, divers with 3 stars per CMAS or diver of an equivalent category, trained by the other international diving schools standard mentioned in SOP HUD.
- Diving instructors trained by international diving schools mentioned in SOP HUD.

5.2. The lowest grade of skill for restricted tasks is the diver – lead diver, and the highest grade is the instructor - diving coach or the diving instructor with three stars.

CHAPTER VI

DIVING ORGANIZATION FOR HUMANITARIAN UNDERWATER DEMINING

6.1 Diving HUD organization is a number of planned activities, measurers and procedures done by all the diving subjects, starting with HUD organization management, medical assistance during HUD performances, to the direct performers for the purpose of a safe and effective dive, based on legal documents.

DIVING DIRECTION

Diving documents

1. In the HUD organization the dives are planned on the bases of the following documents:

- Curriculum and teaching program
- Diving plan and
- Special HUD administration orders and instructions.

These documents are denominated: **“dive planning document”**.

2. Training HUD curriculum is a basic document including all topics and exercises, as well as their time.

3. Diving plan and daily diving plan is a document about how realize the determinate dive in accordance with the Diving Rule.

4. Diving on file documents in HUD organization are following:

- Diving plan
- Logbook
- Diving booklet

5. Diving plan book is keeping by lead diver in the special book for diving plans or in his notebook.

6. Logbook is keeping by Lead diver who fills it immediately after dive on the bases of the diving plan book.

The content of logbook is bringing in accords with international diving standards.

7. Diving booklet is basic personnel document. It is used for keeping a file on data about diver skill and interesting during the dive.

Diving data are added into diving booklet from the logbook.

Diving instructor personally certifies dives recording in the diving booklet.

Diving HUD group participants

8. Diving LIDE group, disregarding the used type of apparatus, for HUD consists:

- Dive leader,
- Dive assistants,
- Divers,
- Reserve diver
- Person rowing the navigable vessel,
- Dive doctor and
- Dive instructor-supervising dive.

9. It is not necessary that the diving group have all members in accordance with paragraph 1 of this article. The minimal group that can perform organizing consists: a Lead diver, a diver-performing task in the water and a reserve (spare) diver.

10. During the dive, Lead diver is on the navigable vessel-protecting dive, that is, on the diving boat or on the shore, if it makes enabled better insight into situation on the diving.

11. Dive leader duties are as follows:

- To receive and study diving plan
- To make the diving plan and present it to the competent person responsible for HUD organization
- To make the collective preparation of all members of the diving group/team and check their knowledge about the task.
- To check the diving boat and mounted means functioning properly;
- To control and order transportation, storage, preparation and use of the mine explosive means;
- To check if diving suits wearing divers making tasks in water are correct and complete as well as the reserve diver equipment
- To introduce in the divers health and give permission to dive only to sound (healthy) divers;
- To give tasks to all members of the diving group;
- To introduce all personnel in boat maneuver, in case of connection changing during the dive;
- To order the diving area marking way;
- To order dive and security way;
- To check the knowledge of the fixed signals;
- To order composition and dive leaders of the diving team;
- To order the allowed exposition to oxygen during the dive with pure oxygen;
- To order equivalent deep with air during the dive with gas mixtures;
- To order the decompression treatment during the dive with air and gas mixtures;
- To order the place and alert degree of the reserve diver and security boat during the dive;
- To control diving area and remove all boats which menace divers security;
- To make on file diving documents;
- To analysis after dive the course and quality of the task performance and make report to the diving instructor responsible and competent in the HUD organization.

Besides, the dive leader has to have a great knowledge of the first aid larger measure specific to diving injuries and diseases, as well as to give specific assistance that means, besides others, decompression chamber and decompression tables handling and use.

In case of the diving accident, the dive leader organizes the first aid assistance to the injured diver.

For that reason, he has to order in advance the assistants accepting and transporting the injured or sick diver.

12 All members of the diving group submit to Lead diver. Lead diver carries out all decisions made by diving instructor or administrative organ of the HUD organization.

Lead diver has right to nominate one or more assistants to which he transfers during the dive, a part of his permissions.

13 It prohibits changing Lead diver during the dive.

Exceptionally of the paragraph 1 of this article, in case when Lead diver is not enabling to perform his duty for illness appearing during the dive, the most skilled diver takes on his duties. In this case, diver working as a Lead diver reports immediately about it the administration organ of the HUD organization.

14. Lead diver cannot perform any other job during the dive.

15. Diver assistant is skilled diver of the second or superior category that Lead Diver nominates. During the dive, a diver-assistant can supervise only three divers...

Depending on needs Lead diver can nominate some more assistants during the dive.

16. The administrative organ chooses the certified HUD divers to perform HUD duties.

17. Divers are obliged to:

- Have complete knowledge about duty performing under water.
- Know legal and agreed signals for underwater communication.
- Check regularity of the personal equipment
- Perform all orders done by Lead diver or the person on whom he transfers a part of his competences.
- Go to dive fresh(rested)
- Do not drink 12 hours minimum before the dive.
- Do not have an ample meal 2 hours minimum before the dive
- Report to dive leader and diving doctor on their possible healthy problems
- Take care do not pass the fixed depth and do not exceed fixed underwater time of.
- Take care to perform correctly prophylactic decompression.
- To check before emergence to the surface if there is a threatening navigable vessel,
- Take care of the member of their diving team.

18. The diver trained to dive in the same working conditions to depth on which other divers perform their duties is nominated as a reserve diver.

The reserve diver equips LIDE apparatus with compressed air with two regulators.

19. The reserve diver duties are as follows:

- During the dive he is on the safety boat, if the Lead diver does not give different order
- He completely knows his duty and diving plan
- He must be trained to give First Aid assistance
- He wears LIDE, without diving tank
- On the danger signal he takes diving tank on and he is ready to dive

During the intervention, the reserve diver dive with the marking buoy or with lifeline.

20. The person driving safety boat cannot be a diver, but he has to be able to handle boat engine and he must be familiar with (informed about) team's duty.

During the dive he is permanently on the safety boat and do not perform any other work.

21. The doctor specialist in decompression or maritime medicine is nominative as a dive doctor.

During the dive, the diving doctor is next to the decompression chamber, but if the decompression chamber is not on the diving site, he is there where the Lead diver determines his position.

22. Diving doctor duties are following:

- He checks up healthy and psychophysical state of divers before dive.
- He reports to Lead Diver about the found health state and proposes possible prohibition of dive for certain divers,

- He performs periodically the inhaling and absorbing substances control and reports about found state to the diving instructor.
- He assists to lead diver to fix the decompressed regime and allowed oxygen expositions,
- He has got the means for First Aid assistance,
- In case of the decompressed disease he gives assistance on the place or prepares everything to transport sick or injured diver into hospital and
- After the dive out of the Security curve, he does not leave diving team at least 30 minutes after the last dive.

23. The diving supervisor is a person authorized to control dive realization, activity coordination with diving plans and application of the Diving Rule regulations during the dive.

A diver - diving instructor performs the duty of diving supervisor.

24. If the supervisor during the dive finds out irregularity in diving organization taking in danger divers lives, he can interrupt the dive.

He communicates his dive break decision to the Lead diver. Lead diver personally realizes this decision.

2. DIVING HUD PERFORMANCE

25. The way of the dive performance in LIDE, besides joint characteristics, depends on the dive apparatus and type of the used inhaling medium.

Diving performance, disregarding type of apparatus and inhaling medium, involves following phases:

1. apparatus and LIDE preparation
2. diver wearing
3. dive
4. stay on the working depth
5. emergence
6. diver taking off
7. keeping a dive documentation

26. Apparatus and LIDE preparation involves as follows:

1. Preparation and apparatus testing regularity in accordance with the technical instruction.
2. Safety belt (B.C) control
3. Control of the other LIDE equipment necessary to the task performance
4. Dive leader informing about apparatus and equipment condition.

27. Diver wearing involves:

1. Diving suit wearing
2. Diving knife, watch and depth gauge fixation
3. Weight belt putting on
4. Safety belt wearing (except it is on a packsaddle diving tank)
5. Mask and fin adjustment and putting on
6. Belt adjustment and putting on
7. Divers roping up (except in autonomous dive without marking buoy)
8. Lead diver informing about getting ready for dive.

The minimum LIDE for dive realization is: diving apparatus, scuba diving suit, mask, fin, safety belt (except if there is an apparatus with close circuit hanging on the back), watch, depth gauge, knife, snorkel, and if it is a night diving-an underwater lamp.

Instead of the diving watch and diving gauge, the diver can have a diving computer.

28. The immersion is a phases of the dive involving entry into the water, breaking through surface and coming to the working depth.

At the entry into water on foot or on back, at the dive with close or semi close circuit apparatus, the breathing bag must be empty.

Before immersion with a close or semi close circuit apparatus, it is necessary to make triple rinse of the apparatus-lungs system.

The immersion speed does not have to pass 30m/min disregarding the type of the scuba engine. If it is in use the apparatus with the constant flow, the immersion speed has to be so adaptable to make up an inhaling medium shortage in breathing bag, which is causing by higher environment pressure.

During the dive, whenever is possible, the diver has to let the inhaling medium out of the breathing bag or the air out of the safety belt (BC).

29. The diver stay on the working depth is a phase that lasts from his arrival on the bottom (working depth) to his emergence. If the diver, diving with scuba with air or mixtures, has to perform working task in the different depth, whenever is possible, he must to finish the work in the higher depth first.

The diver does not have to follow sequence of depth if his apparatus is on the pure oxygen.

During this phase, it is necessary to determinate a decompression regime if the air and gas mixtures apparatus is in use, and an allowed exposition to oxygen if a pure oxygen apparatus is in use.

During this phase, if the diver uses a close and a semi close circuit apparatus, he must rinse it first once after 20 min. The others rinses are every 30 min.

30. The emergence phase starts in the moment when divers leave working bottom and finishes in the moment when they break the surface.

If divers use the apparatus with air and gas mixtures, and dive out of security curve with the calculated decompression reserve, it is prohibited to them to return on the working depth.

The emergence may be direct to surface, if the decompression procedure is not necessary, or with stops in accordance with prophylactic decompression tables.

If diver uses semi close diving apparatus with artificial mixtures, he has to make the first simple rinse if the decompression is performing with gas mixtures, that is, triple rinse if the decompression is performing with oxygen.

The speed of the emergence, in diving with air and gas mixtures, does not pass 10m/min.

If, after emergence is foreseen a longer swimming with close and semi close circuit apparatus, the mouthpiece must be close, and it cannot be the low pressure in the breathing bag. It is prohibited to swim with a breathing bag hooked on the breast.

31. The diver performs taking off diving suit in reverse order than wearing, and finishes informing Lead Diver about task performance and objective state.

32. During the dive, Lead Diver keeps diving plan in accordance with annex of this Rule. All other documents are keeping based on the Diving plan data

COMMON SAFETY MEASURERS

33. Common safety measurers undertake all measurers made for higher degree of the divers' security before, during and immediately after the dive, regardless of the type of scuba diving equipment, divers training level and performing tasks.

These measurers include diving area marking, choice of diving and choice of security way.

Diving area marking

34. If the dive is performing near the diving boat, along the anchor or supported rope, where the divers are only 100m away, the diving area is marked by appropriate signals rising on the boat. During the day, the signal dive flags "I" and "R" are rising, and at night the white light above the red is switching on at 2 m distance, both visible from all sides.

These signals warn the other boats do not come closer than 200m.

35. Diving area situated in the open sea, over 100m away the coast, and in which there is no diving boat, as well as in the case in which divers are away the boat more than 100m, is marking with 4 floating buoys.

36. During the dive along the coast, when the divers are more than 100m away the diving or the safety boat, diving area is marked by anchoring the floating buoys.

The buoys are putting in direction of the divers' evolution, in distance not more than 500m, 25 m away the deepest diving site, towards the open sea.

The choice of the diving way

37. The choice of the diving way depend on the more factors, between them the most important are as follows: dive conditions, diving topic, type of diving apparatus etc.

38. There are two way of dive:

1. Autonomous dive with marking buoy
2. Autonomous dive without marking buoy.

39. Lead Diver determinates the choice of the diving way.

40. The autonomous dive with the marking buoy uses during the divers training in tasks they should be performed also independently in the really life conditions or during the human life and important material means rescue.

This way of diving allows to divers with DIVECON, P3, or higher category.

41. The autonomous dive without marking buoy uses in the warlike (combative) training, but only exceptionally in human life and important material means rescue.

The divers with the highest skill of diving category may perform it.

The choice of the safety way

42. The choice of the safety way depends on the same factors as the above-mentioned way of dive. There are two ways to provide the diving security:

1. Direct
2. Indirect

43. Direct way of security means that the safety boat and reserve diver are immediately near the diving site and the diving boat or decompression chamber is at the most 15 min of safety boat drive. If there is a constant connection between the diving boat (decompression chamber) and safety boat, this distance may be 15 min of they joint speed (driving to meet each other).

If there is a helicopter and constant connection with it, it is considering as the direct security if the decompression chamber is not away more than 15 min including the time to take injured diver on.

Indirect security is possible always when there is a dive with the marking buoy or with a lifeline rope. When it is no buoy, the direct security is possible only if the dive is in the limited area, in the known direction, with the approximately known speed and with periodical position control of divers by the underwater connection.

44. The indirect way of the security means that it is not possible to transfer the injured or sick diver to the decompression chamber in 15 min; or in general, it is not possible to follow divers and to control their health state and position.

During this way of security, the diving or security boat, control the wider diving area. They are ready to respond quickly on the divers` call for help.

The divers, secured in that way, must be equipped by signal or connection means (smoke or light signals, underwater lamps, underwater phone, hermetic UKW radio etc.).

PARTICULAR SAFETY MEASURERS

45. Application of the particular security measurers depend on the performing task, the grade of the diver skill, equipment specificity, weather conditions, the performing time etc.

First, the common security measurers must be applied.

Deep diving

46. During the dive over 40 m, regardless the type of the scuba apparatus, it is obliged to apply the direct security measurers in accordance with this Rule. Thus, only four divers can dive in the same time. Before the dive, Lead diver is due to check that the reserve in the air bank is sufficient to fill twice the decompression chamber.

In the organization of over 40 m dive, the nearest location of the decompression chamber and the reliable person phone number has to be mentioned in the diving plan.

Terrain dive in case of emergency

47. During the divers' intervention in the terrain, needs to apply indirect security in accordance with this rule. In those situations, all dives, including successive ones, must be in the security curve.

48. If the dive is organized to repair the underwater part of the ship, the work of the main engine, spinning of helm, throwing anything in the water is prohibited .

During the dive in underwater part of the ship, it is not allowed to use the marking buoy. It is recommended to dive with lifeline rope, if it is possible.

Wreck diving and near the wreck diving for HUD

49. The diver approaches always the wreck ship with the current.

If the diver enters in the wreck, he must be introduced , on the bases of the previously made investigation and drawing, in the arrangement of its rooms. The diver entering in the wreck has to be attached by a rope around his waist, which serves him as signal, life and lead rope.

Another one who remains out of the wreck and maintains the connection with him by the signal rope is due to follow the diver entering in the wreck.

During the load lifting from the wreck, the diver must be on the deck or on the deck plating, what depends on his position.

The diver, who dives, manages the load lifting and members of the diving team perform his orders on the surface. Lead diver gives orders to the diving team being on the surface.

Diving in the powerful current for HUD

50.If the current velocity is over 1 m/s that means diving in the strong current. During the dive in strong current, divers must be attached by rope to the anchoring ship or to the coast, to maintain their position.

The diving boat, which protects this dive, must be anchored by 20% stronger anchor and it is not allowed to be attached to another anchored boat.

Before the dive, Lead diver has to check if the anchor is fixed firmly.

Whenever is possible, it needs to put a fence upstream to protect divers from the direct current and water carrying objects.

If it is not possible, and the danger of diver injuring by water carrying objects exists, it is necessary to interrupt the dive.

Diving beneath the ice for HUD

51.In diving beneath the ice, it is necessary to dive with diving lifeline rope. Dry scuba suit and open circuit apparatus with air equip the diver.

In diving beneath the ice, in the stagnant waters, it is necessary to make a hole to the ice 2x2 m and protect it from freezing.

In the river, in the same case, it is necessary to put a fence upstream to protect divers from possible icebergs.

It is necessary to interrupt the dive, if the ice removes.

It is indispensable to provide heating to the divers waiting for dive; and to those who finished diving, a hot drink.

Diving in the hole for HUD

52.It is necessary to dive with lifeline rope in underground lakes, holes and flooding tunnels. If the holes are jagged and extend deep in the land, the diver must use the lead rope that attaches periodically to the bottom. In return, if it is planned to continue the dive, diver does not collect this rope, except for a blind river branch that will not be investigated any more. In that case, diver collects the rope to the blind branch, and informs the next team what branch is not investigated yet.

To pay particular attention to divers' equipment and equipment parts fastening that might stumble over a bump.

To start the emergence, i.e. return, with 2/3 reserve minimum of inhaling medium.

Underwater razing for HUD

53. The divers finished the razing training on land, may perform it underwater or start the training.

Lead diver of these dives must be skilled in razing under water.

During explosive passing to the diver in water, it is prohibited to drop it with mine cable, fuse or conductor of a detonating fuse. It is preferable to use a special rope for that purpose.

During the emergence, after putting explosive, the diver must pay attention to do not pull out detonator or move explosive charge.

If the explosive charge does not explode, it is destroyed in accordance with **Razing Rule**.

At the explosive activation, the Lead diver is due to allow that all divers and floating means should be on the safe distance from the explosion place. In addition, he must protect the explosion place from hazardous arrival of the boats or ships.

Minefield diving for HUD

54. In the anti mine diving operation, except in case of the contact mine without protection explosive charges, it is obliged to use close and semi close circuit apparatus and non-magnetic equipment. Divers transfer to the diving site in a rowboat, except if it is in question the contact mines which position and depth is known.

During the anti mine dives, Lead diver is due to protect dangerous area of hazardous arrival of the ships.

During this anti mine diving operation, the others anti mine forces cannot operate in the dangerous area (minesweeping, mine obstacles breakers, anti mine helicopters).

Diving in contaminated waters for HUD

55. To dive in the biologic contaminated waters, dry diving suits and mask for the whole face are in use whenever is possible.

Equipment used in this diving operation has to be completely in good order and waterproof, and his test in non-contaminated water is a part of the diving preparation.

Lead diver and diving physician are due to prepare staff and equipment disinfection means. After dive, divers firstly wash themselves by pure water and make exterior disinfection, and then take off equipment.

Divers diving in biologic contaminated water have to be vaccinating against infective diseases.

56. At diving operation in toxic agents contaminated waters acting through the skin, the use of the dry diving suits is obliged. If the toxic material is unknown, it is consider that it acts as if it has acted through the skin.

UNDERWATER PROCEDURES IN CASE OF AN ACCIDENT

1) In diving with AOKD with air

57. In case of an incident under water, caused by apparatus harm and air-supplying failure of one of divers, divers in team immediately emerge using "fraternal breathing".

If the air reserve is not sufficient to correct prophylactic decompression of both divers, they will perform the reduced decompression, using for decompression also safety belt (BC'S) air reserve.

If the diver was alone, he shall emerge with safety belt, trying do not pass emergence speed of 10m/min.

58. If one of divers loses conscious, his buddy is obliged to take him out directly to the surface, taking

care of do not pass allowed speed of the emergence and trying to keep his mouthpiece in his mouth. If it is not possible, he must keep open victim's mouth and throw back his head. If the victim comes to after a faint during the emergence, it is necessary to continue the controlled emergence and make decompression, if it is possible.

2) In diving with AZKD with oxygen

59. In the case of incident caused by apparatus harm, the diver will close immediately the mouthpiece valve to prevent apparatus propulsion, and will emerge directly to the surface, with open mouth and throwing his head.

60. If the incident is caused by losing conscious of a diver from the diving team, for any reason, his buddy is obliged to close his mouthpiece valve as soon as possible, blow up his breathing bag or his safety belt (B.C.) and take him out directly to the surface, taking care do not cause the lungs barotraumatic disease.

3) In diving with APZKD with artificial mixtures

61. In case of the underwater incident with this type of diving apparatus, the procedures done in paragraphs 57 and 58 related on speed and graduality of emergence, or in paragraphs 59 and 60 related to apparatus handling to prevent the water penetration and apparatus propulsion will be applied.

CHAPTER VII

UNDERWATER MEDICINE

1. MEDICAL EXAMINATION

7.1. HUD organizations' divers undergo medical examinations:

- Selective specialist systematic medical checkup,
- Control specialist systematic medical checkup,
- Medical checkup before diving.

7.2 **Selective medical checkup** for HUD organizations' divers is made before any engagement of divers for HUD tasks.

The results of the selective examination are entered into the divers HUD organizations' medical record.

7.3. Control examinations can be regular and extraordinary.

7.4 **Medical checkup before diving** is not as a regular checkup.

The lead diver is obliged to take a statement on the diving ability from each diver, before each dive, and to register this statement in his notebook or diving planning book.

If the diver declares to be unable to dive, diving is prohibited to him, and he must be sent to the diving physician.

If the diver declares to be able to dive, but the diving director finds the opposite, diving is prohibited to him, and he must be sent to the diving physician.

2. DIVING INJURIES AND SICKNESS

7.5. General and special measures for diving sickness and injuries prevention are the general and special measures of security according to this rule.

7.6. In case of injury or sickness due to diving, first aid measures are performed (self-aid, inter-aid), as well as partial or complete medical aid and general and special aid.

All levels of aid start with safe hold of the injured or sick diver (further on i /s) on the surface and a quick and secured transport to the diving physician, with a constant first aid during transportation.

7.7. For the hold and transport of the injured/sick diver, the forces from HUD organization are determined in advance. The HUD organization competent service plans those forces. However, Lead diver manages the hold and transport of i/s diver.

The Lead diver plans and orders the transport means position during the dive and the transport direction if appears diving injury or sickness.

7.8. The Lead diver and the diving physician are due to have a practical knowledge of extended first aid for diving injuries and sickness and the measures of special, that is, to be familiar with and to be able to use decompression chamber and decompression tables.

All other members of the diving group/team are due to have a practical knowledge of the first aid measures and procedures.

7.9. In case of diving i/s, the measures that should be undertaken are organized into three phases.

7.10. **First phase:** from the diving site to the organized health care center, consist of:

- Safe taking out of i/s diver and his holding at the water surface,
- Safe keeping of diver at the surface,
- Safe lift of diver into the safety boat or the onto the shore (prevent the diver to fall again in the water),
- To set up a approximate condition of his vital functions (breath, pulse, consciousness),
- To set the diver free from the diving equipment,
- To start with first aid measures,
- To make a connection with the diving boat and communicate the i/s conditions and situation under witch the i/s occurred, and
- To organize a quick and safe transport to the diving boat and the decompression chamber foreseen for secure dive.

The buddy, the reserve-diver and the safety boat driver provide measures from the first phase.

7.11. **The second phase** is carried out at the place where the organized diving health care center is situated and consists of:

- Immediately after the alert prepare a competent team for the diver's reception and for decompression chamber treatment,
- Provide the reception of the i/s diver at the health care center,
- Quick insight in the conditions of the i/s with a quick evaluation of the previous first aid measures results,
- If needed, immediately proceed to the measures of the cardiopulmonary reanimation, general medical aid or a short preparation of the i/s diver for the recompression chamber treatment,
- If needed, prescribe medical therapy and start recompression, and begin with the therapy recompression records.
- Take the data from the diving participants on the diving conditions and the event before the diving accident, and the data regarding the accident,
- Inform the lead diver on the conditions of the i/s and the undertaken measures, as well as an eventual transport need into a medical center where a full specialist and special treatment can be done, depending on the conditions and kind of the i/s,
- Determine the transport mean and the precise conditions of transportation from the decompression chamber to the medical center,
- Determine the escort during transport and assign him with needed instructions,
- Take contact with the medical center and communicate all necessary data on the i/s conditions, the undertaken measures and the kind and ways of transport,
- Insure a safe keeping of i/s diving equipment according to this rule,
- Moreover, make a record of all undertaken measures by chronological order.

The diving physician and the decompression chamber manipulator undertake the second phase measures. The lead diver can assign other team members for second phase realization.

7.12. **Third phase** is undertaken in the medical center set to provide full specialized and specific medical help and consists of:

- Definitive diagnostic on the i/s conditions,
- Efficiency check out of the given medical aid and the continuation or addition to the medical therapy,
- If i/s has been transported outside the decompression chamber, and if requested by the kind of sickness, start at once with the therapeutic decompression,
- Practicing of the therapy until total cure or until therapeutic effects wearing out,
- Care and rehabilitation of i/s and an evaluation of his general and working abilities, and
- Prepare the patient and organize the transport to a specialized medical center where the therapy will be supplemented or hospitalize the i/s, if necessary.

Those measures are undertaken by special medical centers with special team and equipment for recompression therapy in recompression chambers and institutions skilled to provide full specialist medical care.

3. TRANSPORT OF THE INJURED OR SICK DIVER

7.13. The transport of i/s diver from the site of i/s to the institution able to provide full specialist care can be done by water, ground or air, with formation or adapt transport means.

The lead diver in accord with the diving physician does the choice of transport mean and way, depending on the i/s weight, condition of his vital physiological functions and on the fact if he is transported in or out the decompression chamber.

The lead diver also determines the escort team during transport.

7.14. If i/s is transported inside the decompression chamber, outside the special carrier transport mean, than it is chosen a such transport mean to provide safe loading, transport and unload of the chamber, team for decompression chamber management and the needed medical means.

The chosen transport mean should also provide the loading of air reserves, increased for 50% for a safe decompression therapy following the started medical treatment, until the i/s diver is put into the special decompression chamber.

7.15. If the i/s diver is transported outside the decompression chamber, that transport mean should prevent additional traumas to the diver during transportation and enable first aid, general and indispensable elements for a special medical aid full measures application.

If i/s is transported by air, in an aircraft that has no possibility to insure a constant pressure, the flight altitude is limited to 300 m.

4. DIVING HYGIENE

a) Divers food

7.16. During the terrain planning HUD diving tasks, it is obligatory to consult a diving physician for the divers` food. .

Energetic needs of divers performing their tasks, in general, should be satisfied with a diet consisting as follows:

- 50-70% carbohydrate,
- 10-15% proteins and
- 20-30% fat.

In the divers diet, in general, it should be avoid vitamin concentrates, and give preference to a balanced natural food.

7.17. Divers preparing to perform diving tasks do not eat two hours before diving.

It is prohibited to have alcoholic drinks at least 12 hours before diving, during diving and 2 hours after diving.

7.18. On the diving site, during night diving in unfavorable weather conditions, whenever possible, provide hot drinks for divers accomplishing their tasks.

b) Disinfections of divers equipment

7.19. After diving, each diver is due to wash and store his diving equipment as prescribed by the producer or the reparation and maintenance service within HUD organization.

For washing the equipment ordinary, bacteriological and chemical clean water is used.

On the terrain, the equipment can be disinfected in a common vessel with a mild solution of hyper manganese.

7.20. The diver equipment used for diving in biologically or chemically contaminated waters is to be disinfected and submitted to a bacteriological and chemical check out.

The HUD competent service is planning, organizing and monitoring disinfections of the diver equipment.

When the HUD competent service finds it necessary, it can engage a specialized institution for final disinfections and disinfection's monitoring.

5. MEDICAL MATERIAL MEANS

7.21. Divers who are diving away from medical centers and who are accompanied by a diving physician should have a set for aid in case of decompression disease and gas emboli, as well as the cardiopulmonary injuries and diseases, as follows:

Surgical equipment and instruments, bandages, medicaments, diagnostic instruments and equipment for pneumothorax treatment

CHAPTER VIII

UNDERWATER ACCIDENT INVESTIGATION

8.1. Underwater accident, according to this rule, are intended any diving sickness, divers injuries and any damage of diving apparatus during the dive.

a) Procedure for underwater accident investigation providing

8.2. To provide investigation the lead diver, immediately after the accident, is due to undertake all necessary measures to keep the diving equipment, especially the diving apparatus, in the conditions it was in the moment of emergence.

For that purpose, it is necessary to close immediately the diving tanks as well as the mouthpiece in the close and semi close circuit apparatus.

If the apparatus has an overpression valve, it should be closed with an adhesive tape to avoid the leak of the gas mixture from the breathing bag.

8.3. The equipment used during the accident should immediately be stored in a separate room, seal it and forbid access.

The committee for underwater accident investigation breaks the seal in the presence of the Lead diver.

After taking care of the equipment, the Lead diver with the diving physician puts a short description of the conditions of the injured when emerging. If it is equipment damage, without consequences for the diver, he can do it alone.

8.4. If the injured diver was diving in a pair or team, the Lead diver, immediately after taking off diver, makes a statement on how the accident occurred, when and how it was observed.

If the spare diver intervened, the statement is made from him, and if needed of other persons.

If during the accident only the equipment is damaged, the statement is made from the diver using that equipment.

b) Accident investigation committee

8.5. The first grade committee for underwater accident investigation is formed by the director of the HUD organization where the accident occurred, immediately after he'd been alerted.

The committee consists of:

1. diving supervisor as the committee president,
2. one diving physician, if possible not the one insuring that diving,
3. one diving instructor, who is not in accident occurred team and
4. one technical person with a good knowledge of the diving equipment.

If the accident occurred due to the diving equipment damage, without consequences for the diver, the diving physician is not assigned to the committee.

The committee must have access to all required documents.

c) Accident reconstruction

8.6. The reconstruction of the accident should determine the cause and consequences of the accident. The reconstruction consists of diving documents inspection; determine the conditions under which the accident occurred and checking up of the equipment in which the accident occurred.

8.7. Examining the planning documents and the diving evidence, the committee is due to establish:

- diving task and conditions,
- diver's category and if he was able, according to this rule, to accomplish the given task,
- the number of dives, the depth of diving and the equipment used by the diver during the last 30 days,
- the result of the last medical checking up,
- the diver's health condition before diving,
- the regularity of absorbance material and inhaling medium used for diving,
- condition of the equipment used for diving, given in technical booklets and cards,
- if the diver was properly equipped according to this rule,
- if the diver when diving executes the lead diver commands,
- the diving depth and phase when the accident occurred,
- if the regulations from point 3.4 to 4.4 were observed and
- what are the immediate accident consequences for the diver or the equipment.

After examining the documents, the committee makes a report on the found facts according to the documents, with an accent on an eventual disagreement between the documents and the diving participants' statements.

8.8. Examining the equipment of accident the committee is due to establish:

- eventually equipment parts lack from the minimum of LIDE regulated by this rule,
- mechanical damages on the apparatus or the equipment,
- apparatus and equipment good functioning,
- correct watch and depth gauge (decompression gauge)
- composition of the gas mixture in the breathing bag and state of absorbent substance,
- composition of the inhaling medium in diving tanks and regularity of the communication means used during the dive.

8.9. After the examination, if the finding shows that the apparatus and the equipment were correct, a trial diving takes place with the accident equipment.

The trial diving is done in favorable conditions according to this rule, in pair or team.

After diving trial, the committee gives a final opinion on the equipment good functioning.

The final report must include the committee opinion on the cause of the accident.

d) Reuse of equipment

8.10. After the final examination of the underwater accident, the equipment used when the accident were occurred, or its damaged parts, if apart, is sent to a verification or repairing, depending on the degree of damage.

Before this equipment reuse, a trial diving is obligatory.

8.11. If the underwater accident resulted in diver death, the apparatus is due to be sent on verification, no matter if it is found harm or not.

During this verification, the apparatus technical booklet is changed, without imputing the data on previous user (the late diver).

CHAPTER IX

INHALING MEDIUM AND ABSORPTION SUBSTANCES

9.1. The composition of inhaling medium and absorption substances used for diving is prescribed by the international diving standards, defined as the percentage of element it has to contain, as well as elements it has to not contain, or their upper limit.

REGIONAL CENTER FOR DIVER TRAINING
IN HUMANITARIAN UNDERWATER DEMINING