

**Romanian – Serbian Cross-Border Risk Monitoring  
in case of Emergency Situations RORS 218**

Rumunsko-srpsko prekogranično praćenje rizika  
u slučaju vandrednih situacija RORS 218



**TRENING CIVILNE ZAŠTITE**  
**CIVIL PROTECTION TRAINING**  
**INSTRUIRE DE PROTECTIE CIVILA**

**Partneri na projektu/Project partners**



**CBRM**

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# First aid

## I. Introduction

First aid is a set of measures and procedures that are taken after an injury or a sudden illness with the aim of saving the life and preserving the health of the injured or sick person by the person who is the first to provide help.

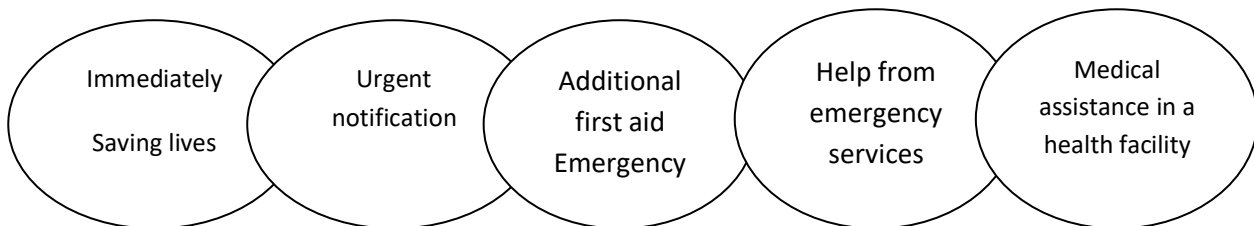
The goals of first aid are:

- Saving the life of an injured person,
- Acceleration of healing,
- Reduction of disability and
- Early rehabilitation.

Responsibilities of the first aider:

- Assessment of the accident scene and emergency call for help
- Security measures
- Timely recognition of the injured person's condition and types of injuries
- Rapid application of appropriate first aid measures while respecting the order of urgency
- Organizing, preparing and carrying out transport to a health facility, or staying with the injured until the arrival of Emergency Medical Service
- Protection against transmission of infection
- Submission of reports to Emergency Medical Service

Rescue flow:



The first aid should:

- Controls his reactions and controls the whole situation
- Behaves calmly and logically
- Acts carefully but also decisively
- Communicates with the injured in a polite but clear and authoritative manner

## **II. Procedure at the scene of the accident**

The basic steps to take in any accident are:

1. Stay calm - before taking any action, try to control your feelings and take a moment to think (don't rush into potentially dangerous situations)
2. Assess whether the place of the accident is safe and remove the danger for you and the injured person - if you are not able to remove the danger yourself, call the competent service (electrical distribution, firemen, police, etc.)
3. Assess the condition of the injured and whether someone's life is in danger - for each injured person it is necessary to establish: Is he conscious? Is his airway clear/is he breathing? Is it bleeding profusely? If the answer to any of these questions is Yes, the person is considered life-threatening.
4. Help the most vulnerable - carry out immediate first aid measures (e.g. stopping heavy bleeding, resuscitation, etc.)
5. Call the Emergency Medical Service
6. Provide additional first aid measures until emergency services arrive.

### **What should I tell the emergency services?**

As at the beginning of every phone call, we need to introduce ourselves first, with full name and surname. After that, we talk about what happened (eg a traffic accident) and where we are. If we don't know exactly where we are, I need to describe my surroundings as best as possible, e.g. the most impressive buildings or some unique locations. After that, we should announce the number of injured and their injuries, if we have established them so far. If there are any potential risks that we could not eliminate, the emergency services should be notified (eg leakage of toxic gas or liquid, damage to transmission lines, unfavorable conditions on the roads - ice, fog, snow, etc.).



- Police → 192
- Firefighters → 193
- Emergency Medical Service → 194

If you need help or any guidance to adequately help the injured person or persons, you can ask what to do at the end of the call.



III.Means providing

for First Aid

Classification of first aid materials and means:

- For treating wounds and bandaging - bandage material;
- For immobilization (calming the injured part);
- For carrying and transporting the injured and transportation.

Bandage material is divided into sterile bandage materials and non-sterile bandage material. A typical example of sterile bandage material is gauze, which can be found in sizes from 5x5cm (so-called compress) up to 1m. The most important thing about sterile material is how to handle it, that is, how not to dirty it when opening and using it. Sterile material is mostly used to cover open wounds to prevent infection. After placing the gauze on the wound, we can fix it with a calico bandage or a triangular scarf (which is a non-sterile material).

The funds for providing first aid can also be divided into:

- Dedicated (calico bandage, gauze, triangular scarf, leucopaste, hanzaplast...)
- Improvised (a scarf instead of a triangle scarf).



#### **IV. Assessment of the condition of the injured person**

Assessing the condition of the injured and determining the type of injury are a prerequisite for providing appropriate first aid measures.

When making this assessment we need to pay attention to:

- Mechanism of injury
- General impression of the injured person - gender and age of the person, the position in which they were found, whether communication with the person can be established, whether there are visible traces of bleeding...
- Determine complaints and type of injury - through primary and secondary examination, we look for symptoms and signs

A mechanism of injury can help you predict what injuries can be expected depending on the direction, strength, and mechanism of the force. It is important to get the data: What happened? When did it happen? How did it happen?

When we examine the injured, we look for symptoms (what the injured complains about, eg pain, nausea, dizziness) and signs (what we can notice ourselves, eg the presence of bleeding, deformities, pallor of the skin). We distinguish between three types of reviews:

- Primary examination - to determine whether the person's life is in danger (whether he is conscious, breathing and bleeding heavily)
- Secondary examination – examination of the body from head to toe with a conversation with the injured (if possible)
- Control examination - repetition of the examination from head to toe after immediate first aid measures have been applied.

#### **V. Measures of basic life support**

Before talking about basic life support measures, we should distinguish between 3 different levels of consciousness in an injured person:

1. Conscious - what we equate with being awake
2. Disturbance of consciousness - the person reacts slowly and inadequately (the rescuer may have the feeling that the person is "looking through him")
3. Unconscious - the person does not respond to loud speech or a pat on the shoulders, we immediately proceed to check the patency of the airways and check breathing.

It is important to make a distinction between fainting ie. short-term loss of consciousness and unconsciousness. Short-term (transient) loss of consciousness in apparently healthy people, most often occurs suddenly or with short-term symptoms (sparkling before the eyes, nausea, weakness...), the reason is a short-term transient reduced blood supply to the brain (pressure drop, starvation, standing

for a long time, sudden change of position -sudden standing up). The person returns to a conscious state very quickly and recovers without consequences and returns to regular activities. An unconscious state can be very dangerous for an injured person.

An unconscious person may be at risk of breathing. If an unconscious person lies on their back, the tongue may stick in the throat. When this happens, air cannot pass through the airway. By throwing the head back, we release the airway of the injured person.

If, after checking the breathing, we find that the person has preserved breathing, we transfer him to the so-called lateral coma position (lateral recovery position).

If during the breathing check we find that the person is not breathing, we need to apply resuscitation measures (cardiopulmonary resuscitation - CPR).

With cardiopulmonary resuscitation - CPR, the speed of initiation is key, because the sooner we start with its implementation, the greater the chances that we will succeed.

There are various patterns of sudden cardiac arrest, such as:

- Heart diseases (most common – about 85% of cases)
- Airway obstruction
- Drowning
- Heavy bleeding
- Anaphylactic shock
- Electric shock

Steps in the resuscitation procedure:

1. Secure access
2. Checking of consciousness
3. Seeking help from the environment (we are looking for the calmest person if we are alone, who will at least call Emergency Medical Service)
4. Open the airway (throwing the head back)
5. Call Emergency Medical Service on 194
6. 30 chest compressions
7. 2 breaths (mouth-to-mouth artificial respiration)

We alternately perform 30 chest compressions, followed by 2 breaths. We repeat this cycle until:

- the person does not regain breathing,
- no one replaces us,
- until Emergency Medical Service arrives.

After 3 done cycles in the ratio of 30:2, we need to check the breathing again.

## **VI. The most common injuries**



## A. Bleeding

There are several ways to classify bleeding:

- Division according to the place of bleeding
- Internal bleeding (in body cavities)
- External bleeding (from cuts)

Division according to the type of injured blood vessel:

- Arterial bleeding
- Venous bleeding
- Capillary bleeding

First aid measures to stop (external) bleeding:

1. Placing gauze over the wound and applying direct pressure to the wound (if there is no foreign body in the wound or if there is no bone protruding due to an open fracture)
2. Placing the injured in the appropriate position - sitting (slight bleeding and head injuries) or lying with the legs raised, i.e. position of autotransfusion (heavy bleeding, e.g. atrial)
3. Dressing the wound with a calico bandage (stronger bleeding) or a triangular scarf (weaker bleeding)
4. Preventing the occurrence of shock - maintaining an adequate position, warming the injured...

First aid measures for internal bleeding:

1. Help the person lie on their back
2. Bend the injured person's legs at 90 degrees, and place some support for his legs, for example a chair
3. Free him from tight clothes (belts, pants...)
4. Warm the injured person
5. Check the breathing and pulse of the injured person every 2 to 5 minutes.

First aid measures for nosebleeds:

1. Place the injured person in a sitting position, leaning on his knees
2. Instruct the casualty to pinch the top of the nose with their thumbs to stop the bleeding
3. Tell the injured person to breathe through the mouth
4. Give the injured person gauze or a clean tissue to wipe
5. The pressure should be maintained for 10 minutes, after which it should be checked whether the bleeding has stopped (after 30 minutes, if the bleeding does not stop, it is necessary to go to the hospital)

Wounds are open mechanical injuries in which the skin and other tissues are damaged in depth below it. We can divide them into:

- Burns - only the surface layer of the skin is damaged
- Lacerations - caused by blunt mechanical force (hit with a stick or falling on a solid surface)
- Cuts - caused by sharp mechanical force (knife blades, scissors, etc.)
- Joints - caused by animal bites
- Punctures - caused by the action of pointed objects (awl, screwdriver) that can remain in the wound
- Amputations – severing of body parts by external force
- Wounds caused by firearms - can be gunshot, gunshot and explosive.

Since all the above wounds are open, it is necessary to cover them with sterile material (gauze) to prevent infection. Important notes:

- No type of wound should be touched with the fingers,
- Do not put any ointments or powders on the wound,
- We must not put cotton wool directly on the wound,
- In the case of puncture wounds with a foreign body, it must not be taken out under any circumstances, as severe bleeding and further tissue damage may occur.
- Unlike all other wounds, wounds are already considered infected immediately upon occurrence and therefore should be washed with soap and water.
- Peelings should be washed off with water only,
- Head wounds often look heavier than they usually are (the bleeding is not as bad as it might seem).

General first aid measures for wounds:

- Stopping the bleeding
- Placing the injured in the appropriate position
- Protection of the wound from infection and drying
- Mechanical support of the injured tissue (immobilization)
- Care of the injured

First aid measures for a head wound:

- Direct pressure on the wound through sterile gauze
- Place him in a semi-sitting or sitting position
- Compression bandage (in case of heavy bleeding)
- Any serious head injury, especially if accompanied by loss of consciousness, requires stabilization of the neck and head
- Provide transportation to a health facility.

## **B. Burns**

It is caused by the effect of excessive amounts of heat, chemicals, electricity or various radiations. By damaging the structure of the skin, burns allow bacteria to enter the body. Evaporative fluid loss is increased. Shock can occur, which is a very serious general condition of the organism that can end in death.

We distinguish 3 degrees of burns:

- First degree burns – red, warm and painful to the touch skin
- Second degree burns - blisters appear on the skin (which must not be pierced!)
- Third degree burns – black charred tissue (damaged sus vi layers of the skin) and absence of pain.

It is especially necessary to pay attention to burns of the respiratory tract, which can occur in e.g. injured people who were pulled out of the fire. Then we let the person suck on ice or we give him very small amounts of water to swish in his mouth and swallow slowly, in order to try to cool the burns.

The basic first aid measure for all burns is cooling (minimum 10 minutes for thermal burns and 20 minutes for chemical burns). After cooling, the burns can be gently bandaged with gauze and a triangular scarf (care must be taken not to exert strong pressure on the wound so that the dressing material does not stick to it).

Notes:

- It is very important not to overcool the wound in order not to cause a counter effect, i.e. frostbite. If we use ice (or anything frozen), we must wrap it in a cloth (triangular scarf) so that it does not come into direct contact with the skin
- If some clothing sticks to the skin when a burn occurs, we must never try to remove it because we can create even bigger wounds on the skin
- Blisters must never be punctured, as this opens the way for infection and further fluid loss
- We also do not put any ointments or powders on the burns
- Burns on the face are never bandaged, only cooled

## **C. Injuries of the bone-joint system**

### **a) Fractures**

Depending on the condition of the skin above the injury site, we distinguish:

Closed injuries

Open injuries



First aid measures for fractures:

- Provide rest;
- Place a cold compress on the injury site;
- Immobilize the injured limb by fixing two adjacent joints;
- Provide transportation to a health facility.

The most important first aid measure for all injuries of the bone-joint system is immobilization. Immobilization is placing an injured part of the body in an immobile position in order to prevent further injury and complications. When immobilizing it, it is always important to follow the rule of two - to fix the adjacent joints, that is, those joints above and below the injury (for example, in the case of a lower leg injury, the knee and ankle joint must be immobilized).



An example of hand immobilization, so-called 90-degree immobilization



## Example of leg immobilization, immobilization of the injured with the healthy leg

In the case of a spinal column injury, it is important to ensure strict rest of the injured person and call Emergency medical service. The person providing first aid can stabilize the head and neck with his hands (if the victim is conscious) or take a triple grip that opens the airway (if the victim is unconscious).



### a) Sprains and dislocations

After an injury, the joint may be partially (sprained) or completely (dislocated) displaced from its normal position. These injuries most often affect: ankle joint, shoulder joint and hand joint.

The most important thing with these injuries is not to try to put the joint back in place, because that way the injury can get even worse. First aid measures for joint injuries:

- Ensure rest of the injured person (preferably in a lying position),
- Place a cold compress on the injury and fasten it,
- Slightly elevated injured joint, so-called elevation to prevent swelling,
- Provide transportation in the health apartment.

## D. Conditions

a) Asthmatic attack - a sudden attack of suffocation that occurs due to the narrowing of the airways, can subside spontaneously or after taking medication. There can be various causes of this condition, such as: allergy, infection, cold, emotional stress, physical exertion...

Signs to recognize this condition:

- Sudden attack of difficulty breathing with wheezing
- Coughing and expectoration
- Rapid breathing and heart rate
- Fear, anxiety and sweating

First aid measures:

- Place the person in a sitting position, leaning forward, resting on their knees
- Free him from tight clothes and shoes, jewelry, belts...
- Provide fresh air and a quiet environment if possible
- If the injured person has medicine with him, help him take it
- Check breathing and pulse (apply CPR if breathing stops)

Note: If the attack does not subside after 20 minutes, the injured person must be transported to a medical facility.

b) Anaphylactic shock – the most severe form of allergic reaction.

Signs to recognize this condition:

- Lightheadedness, weakness, dizziness
- Swelling of the face, tongue, lips and throat
- Shortness of breath, hoarseness and difficulty swallowing
- Body rash

First aid measures for anaphylactic shock:

- Call Emergency Medical Service immediately
- Place the person in a comfortable position and free him from tight shoes, clothes, belts, jewelry...
- If he complains of dizziness and nausea, have him lie down and raise his legs slightly
- If they have ampoules of adrenaline with them, especially those who know that they are very allergic to something, help them take the medicine
- In severe swelling, apply cold compresses or give the injured person to suck on ice
- Monitor the casualty's breathing (apply CPR if breathing stops)

a) Heart attack and heart attack

A heart attack is a sudden onset of weaker or stronger pain behind the sternum, which people often feel as pressure/tightness in the chest. This is most often caused by some physical effort, excitement, cold, etc. A heart attack lasts up to 20 minutes (if it lasts longer, it is a heart attack).

Some other signs besides pain behind the sternum are:

- The pain usually spreads to the left side,
- Stops after stopping physical exertion or after taking medication,
- The person feels fear of death,
- Breathing may be difficult and a feeling of physical weakness may occur.

First aid measures for a heart attack are:

- Place the injured person from rest, in a semi-sitting position with the legs bent at the knees,
- If the person has medicine with them, help them take it,
- If the pain does not decrease or does not go away, call Emergency Medical Service

- Check the breathing and pulse of the injured person (apply CPR if breathing and heartbeat stop)

A heart attack or infarction occurs as a result of a sudden complete interruption of blood flow in one part of the heart muscle. This most often happens due to blockage of blood vessels or a blood clot. The greatest danger that threatens is the occurrence of a sudden cardiac arrest.

Signs to recognize a heart attack:

- Severe pain in the chest area that spreads to the left arm, neck and jaw,
- Shortness of breath,
- Sudden weakness, fainting and dizziness,
- Sweating,
- Fear of death,
- Blue Lips...

First aid measures:

- Place the victim in the same sitting position as in a heart attack,
- Call Emergency Medical Service
- Ensure strict rest of the injured person and try to calm him down,
- Give him medicine if he has any,
- Constantly check breathing and pulse (apply CPR if sudden cardiac arrest occurs).

#### a) Hypoglycaemia and hypoglycaemia

Hypoglycaemia is an elevated blood sugar level, while hyperglycaemia is an elevated blood sugar level. Signs to recognize these conditions are:

Hypoglycemia	Hypoglycemia
Weakness, dizziness	Vomiting
Feeling of hunger	Feeling of thirst
Sweating	Dry pink skin
Change in behavior, aggressiveness	Difficulty breathing

The first aid measures for both conditions are the same (especially when you are not sure which condition is involved), which is to give the person something sweet and water and seek medical help.

#### a) Sunstroke and heatstroke

Sunburn is a condition that occurs as a result of excessive exposure to the sun. It is characterized by red sweaty skin, nausea, dizziness, etc. Heat stroke occurs as a result of prolonged stay in an overheated environment (a tent or some closed room). It is characterized by redness of the skin, increased body temperature, no sweating, and disorientation or disturbances of consciousness may occur.

First aid measures are:

- Take the person out of the sun into the shade or take them out of a warm room and remove them from tight clothing and shoes,
- Place the person in a suitable position (sitting or lying down - if he complains of dizziness),
- If the person complains of nausea, give them a bag in which they can vomit,
- Gradually cool the person, for example with a wet triangular scarf,
- If the person does not complain of nausea, you can give him a little water (small sips to avoid vomiting),
- In the case of heatstroke and a more severe form of sunstroke, transport the injured person to a medical facility.



## **Extinguishing fires with equipment and tools**

### **Introduction**

Many researchers claim that reliable evidence of widespread control of fire dates back to about 400,000 years ago in Asian representatives of the species Homo Erectus. 1 The discovery of fire, i.e. the control and management of that resource, was a turning point in socio-cultural and general evolution for prehistoric people because fire enabled cooking and baking food, heating, expanding human activity in the dark and in the cold night hours, as well as protection from insects and predators. Later, man uses the energy obtained from combustion to cause processes and transform different types of energy and use them in industry and everyday life.

Thus, man, by using fire, enabled himself to attack the environment in which he lives, and on the other hand exposed himself to danger, because the use of flame also brings an unpleasant and dangerous phenomenon, which is the phenomenon of uncontrolled combustion, which is called fire. Fires have always been one of the dangers that threaten people, the environment and material goods. The importance of protection and rescue from fires stems from the fact that fires have been causing material damage and taking human lives for centuries. The most effective way to reduce the consequences of a fire, if they cannot be completely avoided, is to take preventive measures, after which measures are also taken in the field of fire protection organization in the company's facilities, in order to carry out the successful evacuation of people, material values and quick notification. localization and extinguishing of fires. In the first part of the work, emphasis is placed on defining the term fire and fire risk, the second part is devoted to the organization of fire protection, and the third part to fire protection measures.

### **CONCEPT OF FIRE**

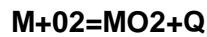
Fires are an extremely common phenomenon, due to the widespread use and exploitation of fire, the danger of fire exists even in spite of precautionary measures. Material damage caused by fires reaches a worrying level and has been increasing in recent years. Fires cannot be completely removed, and the most effective way to protect goods and reduce material damage is to take appropriate protection measures. Not every burning is a fire, but even the smallest burning that causes material damage and poses any danger can be characterized as a fire. It is characteristic of a fire that it causes material damage and endangers the lives of people, flora and fauna or material goods. Most authors define fires as the uncontrolled burning of matter, which is not caused by human action or due to human failure in implementing fire protection measures. Arson is defined as the intentional or negligent initiation of fire. A fire is an uncontrolled burning process that takes place in a certain space and time.

Conditions necessary for the occurrence of fire:

- the existence of fuel
- continuous access of oxygen to the fire zone
- required energy for the creation of fire and the release of thermal energy

Combustion and combustion conditions

Combustion or burning is a complex physical and chemical process based on an oxidation reaction with the release of a significant amount of heat and the appearance of light. In other words, combustion is the joining of burning material with oxygen. The reaction can be displayed as follows:



The reaction is exothermic. The amount of released heat is specific for each substance and varies within wide limits. Burning is the basis of every fire or explosion, and is most often defined as a very fast binding of oxygen with fuel. In the case of a large number of fires and explosions, the basic combustion reactions are reactions of the combination of combustible material with an oxidizer (most often oxygen from the air), and in the case when materials that contain oxygen in their composition (explosives, pyrotechnic materials, etc.) burn, combustion takes place with the help of oxygen that is contained in those materials. 2 fig.1 combustion process The largest number of fires take place through oxidation reactions, and the basic conditions for combustion to occur are the presence of fuel, an oxidizer and a suitable ignition source.

### **Presence of combustible matter**

In order for combustion or fire to occur, one of the necessary conditions is the presence of a substance that can burn. In terms of combustion, substances can be divided into three groups:

- a) Non-flammable substances - cannot be ignited under normal conditions
- b) Flammable substances - can be ignited under normal conditions and can then burn independently until they are completely burned
- c) Highly flammable - substances that ignite and smolder in the presence of a flame, but stop burning after the flame is removed.

However, the previous division is only conditional, because there are substances that burn under certain conditions even though they are classified as non-combustible (e.g. aluminum in a piece or smaller pieces is non-combustible, but in powder form it can ignite and burn even explosively).

The content of water or other impurities significantly affects the flammability (eg ethyl alcohol is a flammable liquid, but when it is mixed with water so that the concentration drops below 40% in the mixture with water, then this mixture is non-flammable). Inflammable substances are distinguished between easily flammable and highly flammable substances. It is characteristic of highly flammable substances that they burn while the flame is acting on them, and when it is removed, the burning stops. This group mainly includes natural fibers (wool, hair), as well as some polymeric synthetic materials.

### **Presence of a suitable ignition source**

The minimum amount of energy that needs to be applied to a combustible material in order to ignite it is called the ignition energy. - Types of ignition sources: a) open flames of matches, cigarettes, fireplaces, various types of candles, welding and metal cutting works, heated surfaces (iron, stove) b)

chemical reactions (obtaining acetylene from  $\text{CaC}_2$ , extinguishing lime, warehouses, means of transport) c) combustion of combustible material, during which heat is released (combustion of explosives and pyrotechnics, explosive combustion of flammable gas mixtures, vapors of flammable liquids and dust d) processes of self-heating and self-ignition e) electrical energy-el. devices and lines (overheating, load). Basically, the principle of preventive fire protection is based on the exclusion of one of these conditions, mainly ignition sources, and in this way, in most cases, the basic condition of preventive fire and explosion protection is met.

In everyday life, a person is always surrounded by the presence of two of the three conditions for the occurrence of fire. These are air and combustible matter, and their presence cannot be eliminated. However, the presence of these two conditions does not necessarily lead to the occurrence of a fire. It is also necessary to have a sufficient amount of energy that can break chemical bonds. The last component of the fire triangle is the source of that energy, i.e. the spark that will initiate the matter-air fuel mixture. When the triangle is formed, there is a high probability that a fire will occur. Preventive fire protection must be based on the exclusion of the presence of ignition sources. It is very important to recognize possible sources of ignition. Most often, fires occur because people do not know what can be dangerous, or are careless when handling flammable materials near possible ignition sources.

### **Fire classification**

Firefighting tactics recognize several classifications of fires, namely:

- 1) classification according to the place of fire development
- 2) classification of fires according to scope and size
- 3) classification of fires according to the stage of development
- 4) classification of fires according to the type of fuel

#### Classification according to the place of fire development

The classification of fire according to the place of its origin and spread, as well as according to the conditions of gas and heat exchange with the environment, can be carried out on:

a) External fires - fires in an open space, but also fires in a closed space where the structure has collapsed, so the fire also takes place inside the open ruins. These fires include: forest fires, field fires, fires of flammable liquid materials, fires of solid materials in the open space, fires in facilities in the open space, fires that spread through external structural elements, etc.

b) Internal fires or fires in a closed space - they take place inside a bordered closed space. Depending on the height and purpose of the building, internal fires can be divided into three groups:

I. Fires on buildings up to 6m high where window openings are located at the same level, where the gas exchange is carried out within the limits of the height of those openings. This includes fires in residential buildings up to a height of 6m, schools, hospitals, administrative buildings, etc.

II. Fires in buildings over 6m high, where openings are at different levels. In such rooms, there is a drop in pressure at high movement speeds, which causes high movement speeds of gases.

III. Fires that take place with completely closed openings, or where there are no openings at all, except for the entrance, and where the possibility of fresh air inflow is eliminated.

## Classification of fires according to scope and size

Firefighting tactics include the occurrence of fires according to the scope and size of:

**a) Small fires** - where a small amount of combustible material is involved in the fire, as is the case with fires of individual objects, small amounts and small areas of fuel. These fires can be extinguished quickly and efficiently with personal involvement with various handy tools (bucket with water, sand, wet blankets, hand tools, etc.)

**b) Medium fires** - where one or more rooms of an object are affected by fire. To extinguish these fires, it is necessary to engage the fire department or the size of the fire brigade unit with the associated equipment and means.

**c) Large fires** - a large fire is considered to be a fire that spreads throughout the entire floor, some part of the basement, or the roof structure, or has engulfed the entire building. A characteristic of a fire of this size is the possibility of rapid spread of fire towards neighboring buildings or combustible surfaces with a large development of heat and combustion products. In the case of these fires, special attention should be focused on enabling and implementing the necessary rapid evacuation of vulnerable persons, as well as preventive protection of neighboring buildings or surfaces not yet affected by the fire.

**d) Catastrophic fires** - these are fires that engulfed entire blocks (block fire) of housing and buildings, parts of settlements or large storage systems with easily flammable fuels. In order to localize a fire of this size, in addition to all available fire brigades with the corresponding equipment, it is necessary to engage all available human and technical resources.

## Fire classification according to stage of development

According to the intensity of development, release of thermal energy, combustion products and speed of spread, each fire duration can be classified into:

**a) Initial stage** - represents a fire in the initial stage of its spread, which is characterized by extinguishing the fire; can be extinguished quickly and efficiently using minimal amounts of extinguishing agents, often a bucket of water.

**b) The raging phase** - it is characterized by the fact that a large area of combustible material has been affected by the fire with a pronounced intensity and a large release of thermal energy. It is difficult to localize a fire in the raging phase, and extinguishing it requires the engagement of large forces and resources over a long period of time.

**c) The phase of a live fire with all its specificities** - represents the development of a fire from the raging phase to the final phase. It is the last stage of fire development, which is determined by low burning intensity, reduced heat radiation and significantly less release of combustion products. At this stage, the main mass of combustible material has burned, the fire process is coming to an end, provided that there is no possibility of new fire hotspots nearby.

## Classification of fires according to the type of fuel

According to the type of fuel and the possibility of using an adequate extinguishing agent, fires are divided into four classes:

**a) Class A** - fires of solid combustible materials in which embers appear (fires of wood, paper, coal, textiles, etc.)

**b) Class B** - fires of flammable liquids in which no embers appear (fires of alcohol, resins, waxes, oil derivatives, etc.)

**c) Class C** - flammable gas fires (hydrogen, acetylene, butane, methane, propane)

**d) Class D** – light metal fires (magnesium, aluminum, their alloys, titanium, zirconium, except sodium and potassium)

**f) Class F** - fires of type F(K) vegetable fats and oils.

In most cases, it is crucial to know what type of fire extinguisher to use. Fortunately, using the device is quite simple.

## **Use of personal protective equipment - disinfection and decontamination of water**

### **About water**

From the Space, the Earth is one large body of water, on which the continents swim. Water covers 71% of the Earth's surface...On earth, 96.5% of the planet's water is seas and oceans, and the rest is fresh water, i.e. 1.7%

Ground water and 1.7% of water in glaciers and ice caps, as well as 0.01% in other water bodies. Thales believed that the basic element from which everything is made is **WATER**. Water is the foundation of life and the basic ingredient of every living being.

### **Why is this important?**

Water either initiates development or limits the development of every community - from nature to civilization!

Water as a vital need of people, i.e. healthy drinking water for the population. Water as a resource is also used in agriculture, both for feeding livestock and for irrigation, but also in the economy as technical water. Water in the household has the function and role of technical water, and it is also used to maintain personal and public hygiene.

However, due to the limited time, and above all the most important role in the lives of each of us,

We are witnessing ever-increasing changes in climatic factors, i.e. temperature, amount of precipitation... Why am I mentioning all this?

Water certainly has a big influence on the climate and weather conditions, and vice versa, but also, that water suffers the most due to the disturbance of climatic conditions. These stresses are prerequisites for the occurrence of events that we call disasters.

Temperature fluctuations and extremes, as well as large amounts of precipitation in a short time in a certain area can lead to phenomena such as floods, droughts, landslides, erosion. These are disasters that are closely related to the climate but also the state of water resources through the Warsaw mechanism or VM methodology. Not only are there disturbances in the quantities and reserves of healthy drinking water, but it is not a rare case that there are disturbances in the quality of drinking water during or after these extreme events.

Although the predictions made by the Paris Agreement in 2015 were optimistic, when it comes to global warming, we can say that the Republic of Serbia will certainly experience the scenario predicted for 2100 60 years earlier, that is, by 2040. In translation, this means that the average temperature will increase by 1.7 C in these areas since the conclusion of the Paris Agreement.

As for precipitation, it will be increasingly extreme and local, that is, in a very short time (a couple of hours) a large amount of rain will fall (over 100 liters/m<sup>2</sup>). Also, there will be no precipitation for a long period of time during the year, which can lead to droughts, during long hot summers and often in autumn.

Such scenarios have already happened to us back in 2014, 2016, 2019, 2020, and the floods that occurred during the winter months, a few years back in 2021-2023, definitely indicate that changes in the climate have already occurred to a large extent. .

Water supply

Water supply can be conditionally divided into public or city and local, that is, alternative sources of water supply. We don't need to say much about the public ones, they are the city water supply system where water is purified through chemical processes and distributed to end customers through the public system, where everything is formulated with rules and procedures and everything is in accordance with the law.

These are facilities or factories for the production of water.

To remove doubt about terminology: in this presentation, alternative sources of water supply are what our law would recognize as local, that is, local water supply systems, with the addition of individual sources of drinking water such as springs, catchments, wells for individual households. In this presentation, I looked at alternative sources of water supply from two aspects.

The first aspect represents the organization and functioning, as a rule, of smaller local village waterworks, local, in areas where public waterworks are not in operation (they are not available, they have not "thrown" with their infrastructure).

This type of organization, exploitation and distribution of water in our country, unfortunately, often in practice functions outside the existing normative framework (outside the law). In practice, we often call these water mains village water mains, which indicate the climate where they were established. From this, a cause-and-effect relationship with the demographic picture and the potential of villages in the Republic of Serbia can easily be deduced. This situation dictates, that is, conditions the exploitation of these water pipes, as well as their maintenance and care.

The second aspect, from which I observed alternative water supply systems, is the possibility and need to put alternative, that is, local water supply systems in the function of water supply to the population in case of accidents and the impossibility of using public water supply systems.

### **Disaster risk assessment - risk management**

As previously stated, various disasters can lead to water supply disruptions. We previously mentioned disasters related to the climate, that is, climate changes, floods, landslides, droughts, erosion, but also disasters such as earthquakes, technical-technological accidents and accidents, can lead to crises caused by a shortage of drinking water. All these disasters and their impacts have been observed through documents such as the Disaster Risk Assessment, and water pipes are part of critical infrastructure. What this means in practice:

*All subjects are obliged to perform analyses, assessments of the impact of disasters on existing water supply systems.*

### **Risk**

In addition, the lack of drinking water is seen as a special risk, which indicates the need for strategic planning of the water supply sector.

### **Before the disaster - norms**

This brings us to the set of laws and regulations that determine both the facilities and the functions of water supply systems.

A special set of regulations was adopted in the health and water management sector. These regulations determine the obligations and responsibilities in water supply, as well as the conditions for the safe supply of healthy drinking water to the population.

A set of regulations from the popular field, Emergency situations, are presented:

- Law on Disaster Risk Reduction and Emergency Management,

- Law on Critical Infrastructure, Methodology on Disaster Risk Assessment and
- Protection and Rescue Plans, etc.

In the context of local self-government, where I also come from, competences and obligations are reflected in the part of local decision-making and action plans, as well as various programs that define measures and dynamics in the organization of the water supply system on the territory of local self-government, and in the area of emergency situations, i.e. reduction disaster risk local self-government units are obliged to prepare local disaster risk reduction plans, protection and rescue plans.

#### Before the disaster- Institutions

In the previous part, we became more familiar with the normative framework for the functioning of water supply. Another important framework, I would say based on the experience gained, is represented by institutions, organizations and individuals, that is, the institutional framework.

For the safety and functioning of alternative water supply sources in particular, a built system made up of various actors down to the user level is very important. Everyone in the chain of the built system has a special place and role. In the event that one place, a link in the chain does not work, the system breaks, which ultimately results in the non-functioning of the water supply in question.

As I emphasized on alternative, local sources of water supply, the advantage here too, ie. give importance to the functioning of civil protection and the population.

#### During the disaster

In addition to measures and equipment, civil protection consists, at the local level, of commissioners and deputy commissioners of civil protection, as well as general purpose units and specialized civil protection units for custody.

Although they have their role even before the disaster occurs, when we talk about rural areas, their importance during a disaster is not negligible, or at least should it be?

The selection of persons who will be part of the civil protection system at the local level, as well as their education in order to acquire general and special knowledge and skills, must be done with special care. Individuals who are part of the Civil protection trustee network must be persons of repute in their communities of origin, with particular skills in leadership and communication, especially when disasters strike.

During a disaster, civil protection commissioners will express the need for support in order to protect or restore alternative water supply lines. In practice, this means that these persons will communicate with the population at risk and the competent headquarters for Emergency Situations and other subjects of the Disaster Risk Reduction and Protection and Rescue System. Their role and skill and skill in communication will also mean for the management of general purpose civil protection units where they exist. In the cases of some local self-government units, and according to the norms,

Voluntary fire companies can play the role of general purpose civil protection units. As a rule, and in accordance with civil protection measures, civil protection at the local level would perform simpler tasks such as mass or large-scale cleaning and disinfection actions, distribution of drinking water in prescribed packaging (bottles, buckets, canisters, etc.).

The distribution of drinking water through water tankers in practice would still be carried out locally public companies in charge of water supply and other institutions owned by them have these resources.

#### After the disaster

When during a disaster there is a disruption in the water supply, i.e. in the quantity and quality of drinking water, the actions that precede the rehabilitation of the well or spring are as follows:



1. **Selection of wells** - It is necessary to start with the selection of wells, that is the one or those that are used the most, which are the most accessible and which are the easiest to train. After selecting a well, it is necessary to assess the type and extent of damage, as well as conduct a conversation with the community about the well in question and assess the resources.

2. **Rehabilitation and cleaning of wells** - first of all, it is necessary to define potential pollutants, if they exist (fecal water, manure deposits, municipal and other waste...) and protect the water facility, and then clean the well (pumping out water, cleaning sludge and sediment) , cleaning the walls of the well, repairing the cover and creating drainage around the well.

3. **Disinfection of the well** - Before we start using water, it is necessary to disinfect the well. The easiest way to disinfect is with chlorine. The preceding actions are the pouring of a certain amount of chlorine, i.e. calcium hypochlorite or sodium hypochlorite. The recommended time required for the disinfectant to work in the environment, i.e. water, is 30 minutes.

After that, it is necessary to pump out the water. After measuring the concentration of the disinfectant, if the limit values are exceeded (above the permitted), the process must be repeated once more, after which it is possible to use water.

Water disinfection - is the removal, deactivation or killing of pathogenic microorganisms such as viruses, fungi and parasites. Microorganisms are destroyed or deactivated when we stop their growth and reproduction by using different methods or using different means. When we talk about water disinfection, we all associate with CHLORINE. Chlorine is one of the most widely used disinfectants. It is very applicable and effective for deactivating pathogenic organisms. Chlorine can be easily used, measured and controlled.

In addition to the mentioned well disinfection measures, we must specify the disinfection measures of the source, i.e. alternative sources, catchments. The principle is similar to that of wells, i.e. rehabilitation or cleaning of the source (protection from potential pollutants), disinfection, i.e. treatment of the source with chlorine or other disinfectant, period of action and then uninterrupted use. In addition to the mentioned measure, disinfection of water from wells or springs can also be carried out with the following measures, namely boiling water, using chlorine tablets and solar disinfection.

### **Boiling water**

The oldest and most commonly used method of water disinfection. The recommendation on the boiling time is different, but essentially the most important thing is that by reaching a temperature of 100 C, the pathogenic organisms are killed or inactive. Keep the boiled water in the container where it was boiled and consume it within 24 hours.

### **Using chlorine tablets**

One of the methods is the use of chlorine tablets that are already prepared for use, more precisely produced for a certain amount of water (2l or 5l - depending on the manufacturer) and packaged that way. We can use them according to the instructions:

**Method 1.-** 1 tablet in a balloon, close, leave for 30 min and can be used. It is practiced at slightly cloudy water and water for alternative sources after disasters.

**Method 2.-** for heavily polluted water with admixtures of sediments, it is necessary to first filter the water (strain through cheesecloth), then add 2 tablets (balloon) to the filtered water, close it, let it stand for 30 minutes, and after that period the water can be used.

### **Boiling water**

The oldest and most commonly used method of water disinfection. The recommendation on the boiling time is different, but essentially the most important thing is that by reaching a temperature of 100 C, the pathogenic organisms are killed or inactive. Keep the boiled water in the container where it was boiled and consume it within 24 hours.

### **Using chlorine tablets**

One of the methods is the use of chlorine tablets that are already prepared for use, more precisely produced for a certain amount of water (2l or 5l - depending on the manufacturer) and packaged that way. We can use them Solar disinfection

Solar disinfection was developed in the 80s of the last century, and research continued in 1991 by the Swiss Federal Institute. It was carried out in plastic bottles of 0.3-2.0 liters. The water bottles stood for 6 hours in the sun or 2 days if it was cloudy.

The combined effects of UV rays, thermal inactivation and photooxidation destroy and inactivate pathogenic organisms.

All measures and activities that require special attention and skill such as disinfection and the like are carried out strictly under the supervision and control of professional institutions such as the Institute of Public Health.

### **Protective gear**

When we talk about water decontamination, we are talking about contamination with radioactive substances. Then none of the offered methods will help us. Then the specialized units of AB HO come into force, that is, units of the army and professional institutions. For decontamination, we can only list the equipment used in those circumstances, which is also presented in the pictures on this slide. Protective gloves, protective mask, protective suit (which are recommended to be used even for the previously mentioned measures where disinfectants are used, as well as protective gloves)

### **Tools and equipment**

I will not list the means and tools that are on the slide, you probably recognize them. I will only comment on the cow. She should remind us that when using disinfectants, for example chlorine, we must take into account to what extent and in what quantity we use them.

By being careless, we can do more harm than good. Contaminate a larger area of land through water.

We already know everything that has been presented so far, you can see in the pictures... Don't be surprised, it was filmed in 1950. Nothing has changed except that today mechanization is used in earthworks.

In the end, it will seem to you that it deviates from the topic, but it is certainly connected and an inseparable part of it, and that is to...

Unfortunately, in our country, it often happens that the functioning of alternative sources is illegal. For this reason, the management of local, alternative sources of water supply leads to accidents, which results in changes in the quantity and quality of drinking water. Maybe bigger disasters are also a trigger, at least for some local self-government units, to put this issue under the auspices of legal and institutional norms.

Effective management of natural resources, especially water, both surface and underground, is a unique challenge, but in the context of modern human development, and this is a prerequisite for the proper development and prosperity of an area.

By creating healthy living conditions, we create and influence people, animals and the entire environment

## **GENDER EQUALITY AND SUSTAINABLE DEVELOPMENT OF CIVIL PROTECTION**

Understanding the issue of gender equality and the concept of civil protection are an integral part of the concept of an emergency situation. We are witnessing the growing insecurity of society as a whole and the growing fear for our neighbours, and this fear stems from the more frequent occurrence of emergency situations, as well as the war in the immediate vicinity, which calls our survival into

question. A well-organized society for emergency situations means that everyone knows their place in the security system, both in your local self-government unit and in the country as a whole. The development of civil protection as an integral part of strengthening the country's security is an interchangeable lever in which there is no discrimination on any basis.

The causes of emergency situations can be different: social (political, military, economic, social, criminal...), technical-technological (accidents in the nuclear, chemical industry...), biological (mass diseases, epidemics, epizootics... ).

In a broader sense, an emergency situation means a situation when the risks and threats or consequences of disasters, extraordinary events and other dangers to the population, the environment and material goods are of such a scale and intensity that their occurrence or consequences cannot be prevented or eliminated by the regular action of competent authorities and services which is why it is necessary to use special measures, forces and means to mitigate and eliminate them with an enhanced work regime.

Conditionally emergency situations can be classified as follows:

- by the nature of the danger (technical, natural, biological, ecological and social character),
- by degree of frequency: the most common (earthquakes, transport accidents); very frequent (eg fires); hazards with moderate frequency (breakdown of utility systems, volcanoes); least often (epidemics, large-scale environmental accidents) and
- by territory coverage (local, local-municipal, regional, national, federal, interstate and global - transnational).

The goal of managing emergency situations is to preserve the stability and safety of protected values that is, the preparation and readiness of subjects and forces of the system, that is, the community, in order to prevent the occurrence and eliminate the consequences before, during and after the occurrence of an emergency event. The focus of the activities of subjects in the management of emergency situations is focused on the protection of life and health of people, protection of material values, natural assets and key infrastructure. Management of emergency situations is realized at the local, regional and global level. Approaches to solving problems in this area are different in individual countries and at different levels, primarily due to the economic opportunities of individual countries, but also the degree of vulnerability to certain dangers.

Authorities have the greatest responsibility for preparations and response in emergency situations. For this reason, different bodies - agencies, trained, authorized and competent to manage emergency situations, are formed in different countries. When sizing such services, authorities should take into account several important elements:

- to have a preventive character;
- to enable the preparation of state bodies, specialized services, other actors for responding in emergency situations;

- to enable the provision of assistance and the organization of protection and rescue in disasters of importance to the state and the seeking of international assistance;
- to enable remediation of the consequences of emergency situations and
- to be qualified to provide international assistance.

The concept of the emergency management system implies the organization and implementation of a series of procedures and activities in the event of an emergency: based on data on the nature, scope and location of the emergency, the national emergency management body makes a decision on the formation of special groups to respond to the emergency. The stability and efficiency of the emergency management system largely depends on:

- legal framework;
- inter-institutional cooperation;
- efficient and reliable material and technical support;
- education (general and professional) and
- scientific research work.

Emergency management systems dimensioned according to the above-mentioned characteristics provide the opportunity to predict the occurrence of emergency situations in a timely manner, based on fundamental assessments and analyses, to foresee preventive measures, to gather forces and resources in the shortest possible time to save people and material goods, and to quickly and efficiently rehabilitate the consequences emergency situations. The emergency management system coordinates and unifies the actions of various subjects, forces and assets in an optimal way and in an optimal time. In that system, civil protection is one of the most important aspects. Civil protection today, in most countries of the modern world, forms the basis of the protection and rescue system. "The basic goal of civil protection is the protection and rescue of people, material, cultural and other assets and the environment from all dangers that have the character of emergency situations, as well as elimination of the resulting consequences." Civil protection: a state service intended for the coordination of the protective population. In order to face the responsibility of protection, many states have provided within their borders various procedures to prevent dangers that can threaten the population and vital installations needed by the local community to save people, material goods and the environment. Those procedures are intended for bodies that may have different names: civil protection, civil defense, civil security, civil planning, etc. In the creation of the state body responsible for the implementation of the protection and rescue strategy, the following principles must be respected:

- Principle of compliance

Under that central principle, it is understood that the adopted measures for the protection of the population's material goods and the environment should be harmonized at the national, regional and local level, as well as the responsibility of the institutions responsible for their implementation.

- Principle of coordination

The management of security measures (prevention, crisis and post-crisis management) is coordinated by an ad hoc body that has appropriate public powers and is under the protection of the state. It is a civil protection service. In fact, civil protection is a coordinating body. Operating in a multi-sectoral context, it is an ideal organization for managing the multiple and diverse operations carried out to preserve the life of material goods and the environment. In this capacity, it is obliged to coordinate the actions of various state bodies that can help prevent accidents and reduce their consequences (health care, police, defense, agencies responsible for environmental protection, energy, etc.), which may belong to different ministries (interior affairs, health, education, environmental protection, defense, etc.). Civil protection is above all an organization responsible for assessing and preparing for disaster protection, formulating a protection and rescue strategy, developing feedback based on experience, etc.

The general goal of civil protection is to ensure the daily safety of life, property and the environment, while implementing effective prevention, successful response and rehabilitation.

Main objectives:

- To limit,
- To ensure a quick response,
- Creation of a new culture in the field of civil protection.

The functions of civil protection are:

- protection,
- help,
- rehabilitation.

The basic functions of civil protection are:

- protection, which covers all preventive activities aimed at preventing accidents and limiting their consequences;
- assistance, which includes all measures aimed at reducing the consequences of accidents, especially rescue and rehabilitation operations during and after the accident.

The general function of civil protection is the protection of the population, material and cultural assets and the environment in the conditions of emergency situations of a natural, technical-technological nature, acts of war and their consequences.

Willingness to predict emergency situations (prediction of types and phenomena of danger), timely notice (continuous observation, monitoring and detection of danger) and, where possible, to prevent, to reduce their effect, as well as to respond - react to accidents and come to an end with their consequences - it rehabilitates, are the most important areas of action and the basic purpose and activity of civil protection, which also represents the first-class state interest.

The basic activities of civil protection include:

- Information and training

Information and training of the population regarding dangers and risks, methods of prevention and preparation for them, as well as establishment of action plans; and training for civil protection managers and members of civil protection.

- Warning of a possible or existing accident

The establishment and management of alert centers along with the prediction and detection of accidents in order to take measures to protect the population without delay.

- Protection and assistance to the population

In the event of a possible or existing accident, it is necessary to protect the population, especially by implementing evacuation and treatment measures, as well as by maintaining the continuity of daily life and survival through the provision of food, sanitary and medical assistance.

- Remediation of the consequences

Restoration of the infrastructure necessary to ensure the living conditions of structures, decontamination, mine clearance, etc.).

Elements of the organization of civil protection:

- Personal and mutual protection,
- Protection and rescue measures,
- Civil protection units,
- Headquarters for emergency situations and commissioners of civil protection,
- Monitoring and notification services,
- Collective payers of civil protection (companies, services, organizations) that perform activities important for the protection of the population, material goods and the environment.

In order to protect and save people, material and cultural assets from dangers caused by natural disasters and other accidents, civil protection tasks are carried out, namely:

- 1) alerting;
- 2) evacuation;
- 3) shelter and urban protection measures;
- 4) taking care of the vulnerable and injured;
- 5) radiological, chemical and biological protection;
- 6) protection against technical-technological accidents;
- 7) protection against demolition and rescue from ruins;
- 8) protection and rescue from floods and accidents on and under water;
- 9) protection and rescue in inaccessible areas;
- 10) protection and rescue from fire and explosion;
- 11) protection against unexploded ordnance;
- 12) first and medical aid;
- 13) sanitation of the terrain;
- 14) preservation of goods essential for survival;

15) urgent establishment of necessary services of public interest.

Bearing in mind all the stated principles, our specificities and needs, the vision of the development of the civil protection system and its inclusion in regional and international integrations, it is necessary to respect the following principles when designing and normative-legally shaping the civil protection system of the Republic of Serbia:

**1. The principle of legal order.** The legal organization of the civil protection system is both inevitable and obligatory, as one of the essential assumptions of its functioning and success. These are activities that fall into the category of the most important social and state tasks and as such must rest on a clearly defined policy and strategy. Civil protection activities must be highly organized and purposefully directed where each entity should know its place in the system and fulfill its prescribed and planned obligation. Under that central principle, it is understood that the adopted measures for the protection of the population, material goods and the environment should be harmonized at the national, regional and local level, as well as the responsibility of the institutions responsible for their implementation.

**2. The principle of international legal conformity.** The system of civil protection organization, its functioning and realization of protection and rescue tasks. it must take place with full respect for all provisions of international war and international humanitarian law. Primarily, this refers to the provisions of the Geneva Convention on the Protection of Civilians and the Additional Protocols from 1977. In addition, in designing the organization of civil protection, the appropriate directions, standards and directions of the development of civil protection prescribed by the International Organization of Civil Protection, as well as the directions contained in the resolutions and declarations of the United Nations and the countries of the European Union, must be respected.

**3. The principle of openness and international cooperation.** This principle insists on the establishment of bilateral and multilateral agreements and agreements with other countries and organizations on the plan of strengthening and joint action of civil protection structures. This especially refers to the possibility of creating the necessary conditions for the access of civil protection organizations to regional, European and global organizations of protection and rescue in emergency situations, and their integration units. In this way, it would be possible to establish the necessary operational and informational functions of international data exchange and assistance in emergency situations.

**4. Modernity** as a principle is a logical requirement arising from the need to respond to an increasing number of diverse forms of threats to people, material goods and the environment. The expansion in the development of modern technique and technology, the increasingly pronounced urbanization of space, the appearance of terrorism as a global threat, contribute to the increase of sources of danger and more and more threats to humanity's everyday life and work. That is why the need for continuous



development and modernization of the civil protection system is becoming more and more important in order to timely detect dangers and take preventive measures, as a basic condition to prevent dangers, protect people and material goods and eliminate the consequences of dangers. And this principle insists on international cooperation in order to exchange experiences regarding the way of organizing modern national systems of civil protection, technical equipment and ways of acting in certain specific types of emergency situations.

**5. The organization of civil protection** implies the need for all human and material resources of the state and society to be continuously organized depending on the role that is intended for them in the respective plans. Plans of all levels should contain an objective solution for the functioning of each element of civil protection, as well as the way of their organization, training for the realization of their functions, goals and tasks. Adequate organization of the civil protection system creates prerequisites to prevent, mitigate and eliminate the consequences of emergency situations. Therefore, it is necessary to constantly monitor and evaluate changes, and to plan and prepare appropriate measures and forces for protection and rescue in advance, in accordance with the possibilities and the resulting changes.

**6. The principle of conformity** implies that the organization of civil protection should be harmonized at the national, regional and local level, that there are no contradictions and that the solutions are in accordance with the provisions in practice.

**7. The principle of authenticity** of the civil protection organization stems from the fact that it must have such an organizational setup to provide answers to specific challenges and risks, which are inherent in our country and society, of course with respect for international standards and the use of appropriate experiences of other nations and countries. Originality is also influenced by the economic and social situation in the country, the demographic situation, the degree of general development of the state and society and its institutions, the degree of vulnerability of the territory in relation to emergency situations, and other factors.

**8. Scientific basis** implies the necessity that all solutions in the civil protection system are based on scientific research and knowledge. Objective scientific expertise and criticism, that is, scientific reliability, is one of the basic assumptions for the rational, efficient and reliable development of the organization of the civil protection system.

**9. The principle of coordination** insists that the civil protection organization appears as an authority for coordination and management of multiple and different protection and rescue operations. It coordinates the actions of various participants in the prevention, protection and elimination of the consequences of emergency situations. The central place in the protection and rescue system, around

which all other participants are connected and whose coordination is carried out in emergency situations, belongs to the organization of civil protection.

**10. Transparency** means complete publicity in the affairs and activities that are carried out within the civil protection system. The civil protection system must be clear to all subjects of the protection and rescue system, to all citizens, and especially to the most responsible state and other structures that decide, create or participate in the creation of policy, strategy and legal norms in the field of civil protection.

**11. The comprehensiveness** of the civil protection system is a logical requirement in the commitment of our state and society to engage all human and material resources in protection and rescue activities.

**12. The ethics** of civil protection expresses the permanent determination of the state and society to participate only in activities that respect the principles of humanity, moral justification and fairness, while respecting the provisions of international humanitarian law.

Of the many principles of organizing and preparing the civil protection system, it is necessary to ensure respect for the following:

1. The principle of prevention is generally accepted in civil protection, and is expressed in the development and application of preventive measures aimed at reducing the risk of danger or (if it cannot be prevented) reducing the consequences. It is especially important in the implementation of prevention, the development of self-protective behavior of all citizens and institutions of the state and society, which manifests itself through concern for one's own safety and protection and not to endanger others with one's actions.

2. Massiveness as a principle implies the planned engagement of all human and technical resources on protection and rescue tasks. This principle insists that the entire population should be trained, prepared and included in the system of protection and rescue, primarily within the framework of personal and mutual protection of citizens. The quantitative character of this principle gives us the possibility to define civil protection as a "system of large numbers". This means that civil protection is first of all organized due to dangers of a wider scale that threaten a large number of people, a large number of material goods and cover large areas of the territory. A large number of people, huge material resources and a long period of time are also needed to remedy the resulting situation.

3. Timely preparation of civil protection in peacetime. This principle implies the organization and preparation of the entire system of protection and rescue in a timely manner, which means still in peace, that is, before the occurrence of danger. By implementing appropriate preventive measures and procedures, by comprehensive preparation of human and material resources, the necessary conditions

are created for quick and efficient action of protection and rescue in case of emergency situations. Applying this principle ensures professionalism, efficiency and flexibility of the organization of the civil protection system.

4. Maximum representation of "collective payers of civil protection". As already mentioned, the term "collective obligee of civil protection" means all those companies, organizations, services and institutions that perform activities important for the protection and rescue of people, material goods and the environment. At all levels of civil protection organization, where existing companies, organizations and services can ensure the realization of protection and rescue functions, it is not necessary to form special organized civil protection forces or civil protection units.

5. Uniqueness and completeness of the system. An important prerequisite for the successful execution of civil protection tasks in emergency situations is that when organizing, preparing and implementing the protection and rescue system, structurally and functionally, one must act in a unified and comprehensive manner. This achieves coordinated functioning and mutual complementation of all elements of the civil protection system. The civil protection system connects and coordinates all other activities of society that are of particular importance for protection and rescue activities in emergency situations.

The principle of unity in the organization and implementation of civil protection is reflected in a single, homogeneous organization of civil protection at all levels in accordance with appropriate assessments, which enable uniform management of civil protection in emergency situations and efficient execution of protection and rescue tasks. Such a unique organization creates optimal conditions to detect dangers in a timely manner, inform competent state and local self-government bodies, citizens and other entities in order to undertake protection and rescue measures and eliminate the consequences in all forms of endangerment.

6. Mobility as a principle requires the presence of forces and assets (companies, organizations and services or civil protection units) in all environments where the population and material goods may be at risk. In addition, at the level of Local Self-Government Units, it is necessary to provide certain mobile forces of civil protection, primarily a certain number of units for specialized purposes or a certain number of teams for quick interventions in the threatened area. The appropriate equipment and mobility of the civil protection system must be at such a level that it will ensure quick and effective interventions in areas of rescue and elimination of consequences in emergency situations. Mobility as a principle insists that in case of danger, forces and resources are engaged without waiting for special decisions, but that it is done in accordance with the existing plans and characteristics of the emergency situation. A prerequisite for a successful protection and rescue action is a correct assessment of the source of danger, adequate dimensioning of forces and assets, and automatic, quick, immediate activation of forces and assets in case of danger.

7. Autonomy as a principle is reflected in the ability of the civil protection system to, with dimensioned forces and means, in a certain area, independently (or in coordination with other participants in that

area), perform protection and rescue tasks as a whole in the scope and deadlines provided by the operational and other plans. To carry out the tasks of protection and rescue, civil protection forces can be reinforced by forces from other defense-protection and security structures, which is regulated by special plans and decisions of competent authorities.

8. The principle of humanity is reflected in the humane and solidarity action of civil protection in all conditions and in the spirit of international conventions.

**LAW OF DISASTER RISK REDUCTION AND EMERGENCY MANAGEMENT OF THE REPUBLIC OF SERBIA (2018) - Article 7** , clearly defines that there is no discrimination in the management of emergency situations. That article defines that the subjects of the system of disaster risk reduction and emergency management take special care of realizing the principle of gender equality and especially take care that no decision, measure or action encourages or leads to a disadvantageous position of women and their equal participation in the system of risk reduction from disasters and emergency management.

Competent authorities and other entities involved in the implementation of disaster risk management measures and activities are obliged to consistently take care of the protection of human rights, gender equality and especially the protection of the poor, the elderly, children, persons with disabilities, refugees and displaced persons, as well as others nutritional groups of the population. Measures and activities to reduce the risk of disasters must be accessible and apply to persons with disabilities, children, the elderly and other persons who are particularly exposed to risk.

In order to understand the importance of the principle of civil protection, it is important to clarify some terms in the field of gender equality and gender equality.

First of all, the difference between equality and equality should be emphasized, because this difference is often not noticed. We are not equal because each individual is different. Some wear and some don't wear glasses, some are blue, some are black, women and men are biologically different. Diversity yes, equality no. That is why gender equality is not equality between the sexes, but equality with respect for diversity.

Gender equality is not a women's issue. Identifying gender equality with a "women's issue" is the wrong approach. Gender equality and the equality of women and men, therefore a principle that applies equally to both women and men. According to the Convention on the Elimination of All Forms of Discrimination against Women, gender equality includes gender, marital status, parenthood, motherhood, sexual orientation... Gender equality is, therefore, a democratic demand for equal opportunities for women and men to exercise their rights while respecting diversity. That is why women and men must work together on these issues.

Differences in the understanding of the social roles of men and women can be observed in different contexts:

- Social: Different expectations of the social roles of men and women: the man as the head of the family and the one who earns money; a woman is the one who gives birth, feeds and nurtures (children and the elderly).
- Political: Differences in the ways women and men acquire and share power and authority:

men are more present in national and high politics; women more at the local level and local politics.

- Educational: Differences in educational opportunities and different expectations from girls and boys: the family directs the education of boys before girls; girls mostly go to less prestigious courses.
- Economic: Differences in career opportunities, financial control and other productive values: credits, loans, ownership of land.

Why is awareness of the importance of gender equality important?

Because women are the majority who are in a minority position. In relation to any other minority, the position of women differs in that they are the majority who are objectively and factually in the position of a minority.

Awareness of gender equality is important because women are in an unequal position compared to men, because they objectively do not have equal opportunities to exercise their rights, because they are exposed to less direct, multi-structural discrimination. It is the society in which we live, which through stereotypes, traditions, and learned things puts us in roles that put us in an unequal position. Stereotypes affect not only women but also men.

Because it is a fundamental value in any normal community. The equality of women and men is a prerequisite for equal opportunities to realize all other human rights. That is why gender equality, from the declaratory constitutional guarantee that was not followed by the necessary instruments for concrete implementation and sanctions in case of violation today, and in our legal system is regulated by anti-discrimination legislation (the Law on Prohibition of Discrimination, first the Law on Gender Equality, then the Law on Gender Equality, Law on prevention of discrimination of persons with disabilities) which regulates and concretizes the basic constitutional guarantee of gender equality, and in the constitutional system there are special, new institutions whose task is to protect the right to gender equality (e.g. Commissioner for Equality, Protector of Citizens).

Gender equality is important for human security, because it is the right of every individual and individual as human beings. That is why gender equality is in the interest of everyone, both individuals and society as a whole. Only in this way will the society be able to use all the capacities of human resources (knowledge, skills, dexterity...), and if the society is not able to realize this, it will suffer from it. Our society is not rich, but it has human resources that are essential for the development of society, but we often treat them irresponsibly.

The state is obliged, the Constitution obliges it to do so in basic principles, to void the policy of equal opportunities and to take special measures to ensure the equality of women and men.

Special measures should cover in equalities, eliminate the unequal position of women and men in society so that they can equally enjoy all human rights guaranteed by the constitution.

It is important that actors in the state and at the local level and at higher levels of government undertake all necessary measures so that both women and men have approximately equal chances to

reach the level of security guaranteed by the Constitution. The state is obliged to listen to the voice of citizens, to use all the institutions available to us.

## **CROSS-BORDER PROTECTION SYSTEM**

EU CIVIL PROTECTION MECHANISM AND INTERNATIONAL COOPERATION IN THE FIELD OF DISASTER RISK REDUCTION AND EMERGENCY SITUATIONS

- About international cooperation
- Providing and receiving international aid
- Host country support
- Bilateral cooperation
- Civil protection mechanism of the European Union

- Other mechanisms of international cooperation: United Nations, NATO, Regional Initiatives

## DISASTERS KNOW NO BOUNDARIES

- Disasters are becoming more frequent.
- Its impacts and consequences are increasingly serious and hinder the functioning of the entire region.
- In recent years, the region has faced catastrophic floods, landslides, devastating earthquakes as well as forest fires, severe weather conditions, pandemics...
- The result is human casualties and material damage, which affects the sustainable development of all countries.

## COOPERATION IN EMERGENCY SITUATIONS IS A REQUIREMENT

- More efficient and effective saving of lives and elimination of the consequences of disasters;
- improvement of management mechanisms in emergency situations;
- reducing risks and strengthening resilience;
- improvement of bilateral relations;
- improvement of multilateral relations with the EU and other important partners.

## INTERNATIONAL COOPERATION IN EMERGENCIES

International cooperation in emergency situations includes:

- providing and receiving assistance in emergency situations and during disasters
- exchange of information about potential risks and threats
- exchange of knowledge and experiences
- joint trainings

## LEGAL FRAMEWORK

The scope of international cooperation in emergency situations is defined:

The Law on Disaster Risk Reduction and Emergency Management ("Official Gazette of the RS, No. 87/18), Articles 102, 103 and 104, etc. Laws.

Broadly speaking, we have two levels of functioning:

- 1) International cooperation "in regular work" which is aimed at strengthening the overall capacities of preparedness and readiness for an effective response.

2) International cooperation "during emergency situations" which is aimed at the response, i.e. sending or receiving international aid in the form of international rescue teams and accompanying equipment and funds, as well as coordination of support activities of the host country.

Giving and receiving international aid\*

- The Government passes a Decision on providing and receiving international aid (Article 102)
- The government prescribes the procedure and conditions under which international aid is received or sent (Article 104)
- The Ministry of Internal Affairs coordinates receiving and providing international aid (Article 25)
- The Republican headquarters proposes making a decision on seeking, accepting and providing assistance (Article 47)\*Закон о смањењу ризика од катастрофа и управљању ванредним ситуацијама:

#### UNDERSTANDING THE CONTEXT OF RECEIVING INTERNATIONAL AID

Levels of emergency management:

The first answer is the most important!  
The first answer is always at the local level

When the scale of a disaster exceeds the ability and capacities of a country for an efficient and effective response and elimination of the consequences, then international assistance can be requested:

- Bilateral
- Multilateral
- Through existing coordination mechanisms

Defining formal forms for acceptance and assistance

1. Content of necessary data
2. Contact points
3. Form

Defining host country support

1. Basic needs for efficient and effective work of international aid
2. Minimum burden for the country affected by the disaster

Defining the position of international teams in a comprehensive national response

1. Cooperation with national forces and interoperability



International teams include:

- in the overall national response
- into the national/local system of coordination and management of protection and rescue entities and forces
- They are responsible to the country that sent them
- In international missions, they act in accordance with the laws of the host country
- Support of the host country for efficient and effective work

## CHARACTERISTICS OF WORKING WITH INTERNATIONAL TEAMS

- Providing support in terms of: accommodation, food, logistical needs, security, medical support, communication...
- Cooperation with the headquarters for emergency situations;
- The international team carries out activities based on the decisions and defined needs of the competent authorities of the country in which it arrived. The role of the liaison officer - operational meetings
- The importance of having up-to-date documents
- Establishing contact i
- for future cooperation, in a preventive sense

## HOST COUNTRY SUPPORT

- Accelerated procedures when crossing the state border
- Providing information on the current situation and forces engaged
- Fuel supply
- Transportation in the country
- Accommodation (food, accommodation and sanitary facilities)
- Medical support
- Communication and radio connection
- Supporting materials
- Security information and
- Safety in the field
- Potential dangers

## THE FLOODS OF MAY 2014

The Government of the Republic of Serbia sent a request for assistance to the international community on May 15, 2014.

The request for assistance was sent both on a bilateral basis and through the mechanism of civil protection of the European Union.

- flood rescue teams
- helicopters
- teams with high capacity pumps
- water treatment teams

The Department for Emergency Situations of the Ministry of Internal Affairs of the RS was responsible and in charge of coordinating and engaging international teams in the affected areas.

The following ministries and organizations were involved in providing and accepting humanitarian aid:

- Ministry of Foreign Affairs
- Ministry of Interior  
Border Police, Traffic Police
- Ministry of Finance (Customs)
- Red Cross
- Local government

#### EU Civil Protection Mechanism

- Germany (35),
- Slovenia (49),
- Bulgaria (28) ,
- Austria (57),
- Czech Republic (18)
- France (88)
- Denmark (30)
- Romania (8)

#### Bilateral relations

- Russian Federation (76),
- Belarus (15),
- Hungary (36),
- Croatia (6),
- Macedonia (58)
- Montenegro (52)

Help was provided by 14 countries with 22 teams (563 rescuers).

Obrenovac, Lazarevac, Progar, Šabac, Sremska Mitrovica, Ub, Krupanj, Jagodina, Paraćin, Svilajnac, Čuprija, Požarevac, Kostolac....

In order to help coordinate the engagement and stay of international teams, the following were in Serbia:

- EU Civil Protection Team - EUCP Team
- United Nations Disaster Assessment and Coordination Team - UNDAC Team
- SVS provided premises and working conditions (internet connections, maps, information, food...)

### INTERNATIONAL AID IN LOCAL GOVERNMENT UNITS

Water Purification Team - German THW Obrenovac 2014

- Good opportunity to understand context and identify lessons
- International teams fit well into the work of local headquarters
- The role of the liaison officer
- Various capacities available
- Interoperability?
- Involvement of international teams in the local response
- Participation in meetings of local headquarters

### BILATERAL AGREEMENTS

- North Macedonia and Albania (trilateral, 2021),
- Cyprus (2021),
- Austria (2021),
- Bulgaria (2019),
- Slovenia (2015),
- Croatia (2014),
- Hungary (2013),
- Slovakia (2011),
- Azerbaijan (2011),

- Bosnia and Herzegovina (2010),
- Montenegro (2010),
- Russian Federation (2009),
- Ukraine (2004),

Negotiations on signing agreements with Greece, Romania, Italy and Denmark are ongoing.

## EU CIVIL PROTECTION MECHANISM

The aim of the European Union is to strengthen cooperation in the field of civil protection - improvement of prevention, preparation and response to disasters

Members of the Mechanism are:

- EU member states
- 6 participating countries - Iceland, Norway, Serbia, North Macedonia, Montenegro and Turkey

Disasters know no borders and can strike one or more countries simultaneously without warning. Having a well-coordinated joint response means that when national authorities are overwhelmed, they have one point of contact, rather than multiple. A joint approach further helps pool the expertise and capacities of first responders, avoids duplication of relief efforts, and ensures that relief meets the needs of those affected.

By combining the capacities and capabilities of civil protection, it enables a stronger and more coherent collective response.

In addition to the EU member states, there are currently 6 member states of the Mechanism (Iceland, Norway, Serbia, North Macedonia, Montenegro and Turkey).

Since its establishment in 2001, the EU Civil Protection Mechanism has responded to over 500 requests for assistance within and outside the EU.

The mechanism also helps coordinate national authorities' disaster preparedness and prevention activities and contributes to the exchange of best practices. This facilitates the continuous development of higher common standards by allowing teams to better understand different approaches and work interchangeably when disaster strikes.

When the scale of a disaster exceeds a country's ability to respond, then assistance can be requested through the EU Civil Protection Mechanism.

In the Republic of Serbia, the national contact point for the activation of the Mechanism is the Ministry of Interior - Department for Emergency Situations.

## EU CIVIL PROTECTION

EU members and the European Commission establish a framework for projects within the IPA fund with the aim of further investment in order to strengthen the capacity of countries to improve management in emergency situations and develop and build systems that are coherent with existing EU regulations, instructions and good practices.

- Regional IPA programs (IPA Civil Protection I and II, IPA FLOODS, IPA DRAM, IPA Forest Fires and Floods)
- Cross-border cooperation programs and projects
- Programs to strengthen prevention and preparedness
- Dr.

## GOALS OF THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION

1. Significant reduction of global mortality due to disasters by 2030;
2. Significant reduction in the number of affected population at the global level by 2030;
3. Reduction of direct economic losses due to disasters by 2030;
4. Significant reduction of damage due to disasters suffered by critical infrastructure and disruption of basic services, among them health and educational facilities, including the development of their resilience by 2030;
5. Significant increase in the number of countries with national and local disaster risk reduction strategies by 2020;
6. Significant improvement of international cooperation with developing countries through adequate and sustainable support that will supplement their national activities for the implementation of this framework by 2030;
7. Significantly increase the availability and accessibility of multiple hazard early warning systems, as well as disaster risk information and assessment by 2030.

## “MAKING CITIES RESILIENT 2030” CAMPAIGN

Local self-government unit - Local headquarters for emergency situations headed by the mayor or the mayor

- The first level of disaster risk reduction;
- The first level of response

The Department for Emergency Situations is, on the one hand, the coordinator of these activities, and on the other hand, it has direct responsibility and authority in saving human lives and property, and joint work and mutual understanding are of great importance.

Campaign 2010 – as many as 50 municipalities joined the campaign 2030 campaign

## COMPLIANCE WITH GLOBAL DOCUMENTS

Hyogo framework 2005-2015

Sendai Framework 2015-2030

- National Program for Risk Management from Natural Disasters in 2014 and Action Plan for the Implementation of the National Program (2017-2020)
- Law on Disaster Risk Reduction and Emergency Management
- National risk assessment
- Protection and rescue plan of the Republic of Serbia

## NORTH ATLANTIC TREATY ORGANIZATION EURO-ATLANTIC EMERGENCY RESPONSE COORDINATION CENTER (NATO EADRCC)

- The Euro-Atlantic Emergency Coordination Center (EADRCC) is NATO's main civilian emergency response mechanism in the Euro-Atlantic area.
- Includes all NATO allies and partner countries
- Coordinating requests and offers of assistance in the event of natural and man-made disasters
- Support disaster preparedness activities through large-scale field exercises
- The Department for Emergency Situations of the Ministry of Internal Affairs of the RS is the contact point for cooperation.
  
- The international field exercise "SERBIA 2018" - was held in the period from October 8 to 11, 2018.
- A total of 2,000 participants took part in the exercise "SERBIA 2018", including 900 foreign participants from 40 countries, international organizations and initiatives.

## REGIONAL INITIATIVE

Disaster Prevention and Preparedness Initiative in Southeast Europe (DPPI SEE),

Stronger relations, developing projects and programs to improve capacity.

10 member countries:

- Albania
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- North Macedonia
- Montenegro
- Romania
- Serbia
- Slovenia
- Turkey

Provision of international assistance:

- Montenegro July 2012
- Greece, Saint Gora, Hilandar monastery, August 2012
- Slovenia, February - April 2014
- Macedonia, August 2016
- Albania, November 2019
- Greece, August 2021
- North Macedonia, August 2021

## First Aid – Practical part

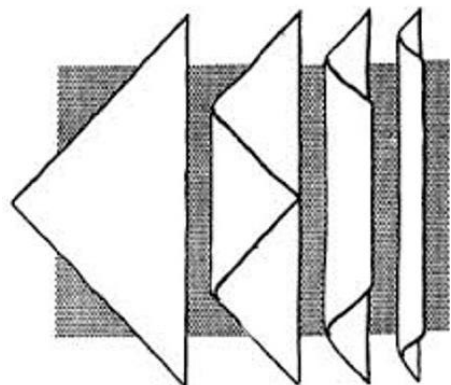
### I. Basics of handling first aid materials

The sterile gauze is opened at the corner of the bag and should be placed on the wound with as little touching as possible. It is essential that we use protective gloves to prevent cross-infection.



**The bandage** is held in the dominant hand, by holding the so-called head of the bandage facing up and the so-called "tail" of the bandage in the other hand. In this way, we prevent the bandage from falling out of our hand, and also make it easier to bandage the wound.

**A triangular scarf** can be used for various purposes during the care of an injury. For dressing, the scarf is usually folded into a curtain (thinner or thicker).



### II. Positions in which we place injured persons

Depending on the type of injury or condition, we can place the injured in one of the following positions:

1. **Lying down** - fracture of the femur/lower leg, also in this position we can raise the person's legs if we try to prevent a state of shock (autotransfusion position)



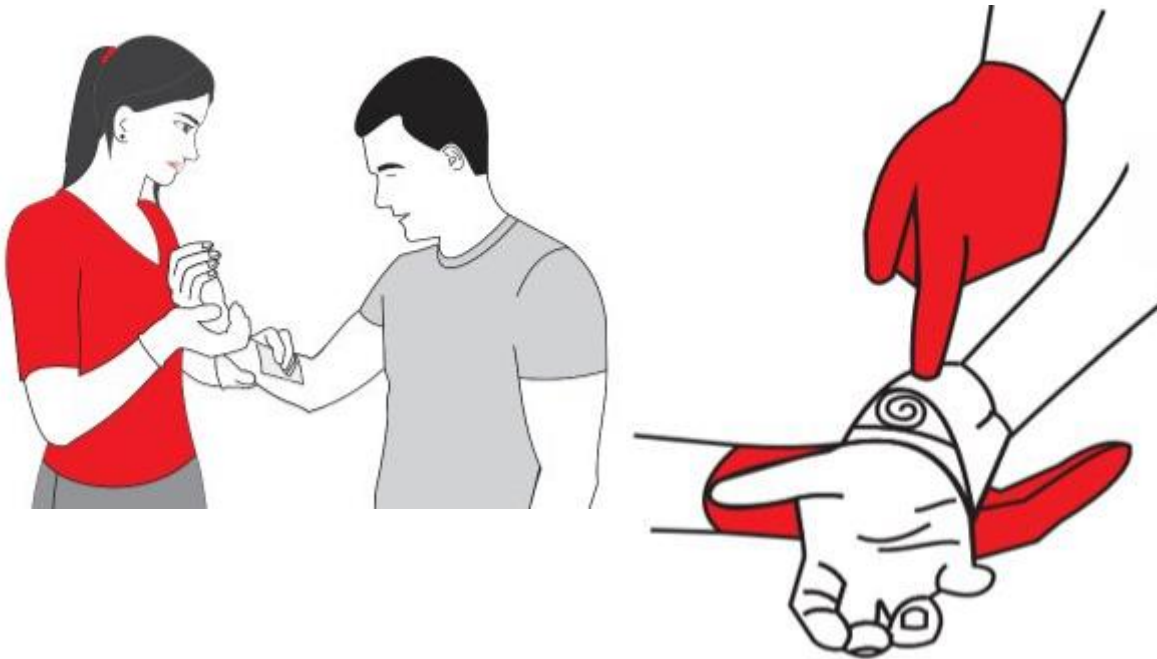
2. **Semi-recumbent** - cuts on the head (to prevent increased bleeding from the wound)
3. **Half-sitting** - heart attack/heart attack, and in this position we can, for example, bend our legs at the knees if necessary
4. **Sitting** - depending on the injury, we can lean the person on us or lean forward (hypoglycemia) and lean on our knees (asthmatic attack)

### III. Bandaging techniques

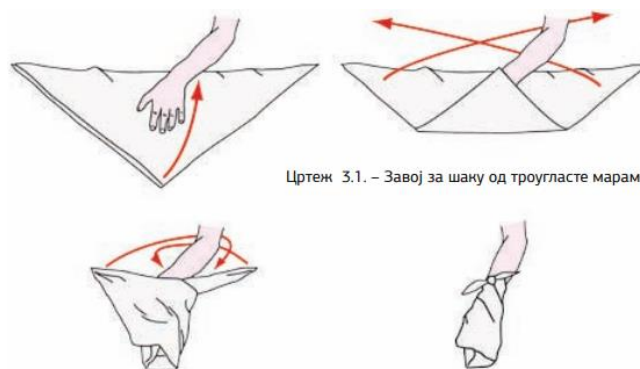
If we have an open wound such as cut, after placing the gauze, we must cover it completely. Depending on the intensity of the bleeding, we will use a triangular scarf (weaker bleeding) or a calico bandage (heavier bleeding). We choose the size of the bandage according to the size of the injury.



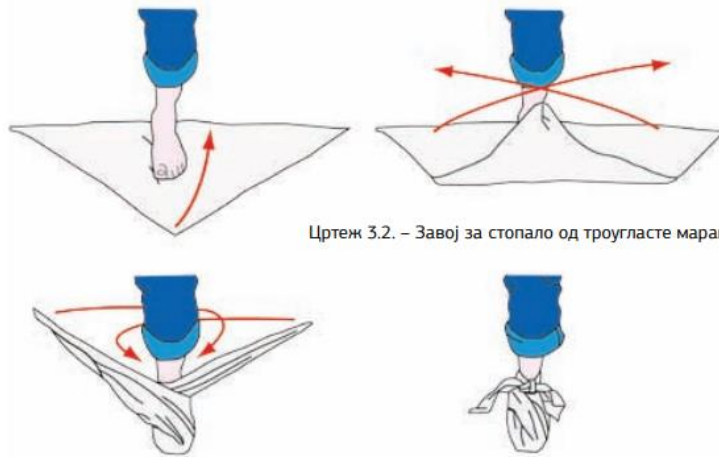
If the bleeding is stronger, after applying pressure to the wound, an additional bandage, the so-called compressive bandage, should be applied, which applies additional pressure to the wound to stop the bleeding. A compression bandage is never placed on the neck or head.



Dressing burns in addition to sterile gauze requires very gentle dressing. We can do this by making a wide scarf from the scarf and not tightening it tightly against the injured part of the body (just enough to attach the gauze). For hand burns, for example, we can use other methods, such as the so-called "glove". The same principle applies to burns on the feet.



Цртеж 3.1. – Завој за шаку од троугласте мараме



Цртеж 3.2. – Завој за стопало од троугласте мараме

#### IV. Immobilization

After treating the injury, it is necessary to immobilize the injured part of the body to prevent further injury and reduce pain and swelling.

There are two basic ways of immobilizing the hands, namely at 45 degrees (hand injuries and burns) and at 90 degrees (upper arm and forearm injuries).



We tie the largest corner of the scarf slightly in a knot, and place it under the elbow of the injured arm. One arm of the scarf is passed under the healthy arm and the other is passed over the shoulder from the injured side. We tie a scarf on the back (preferably not in a knot). If we tied it well, the injured person can relax his arm without it moving.

When immobilizing at 90 degrees, we first place the scarf under the injured arm as in the picture, before that we tied a knot on the large corner of the scarf, as in the previous example. After this, we pass the hanging arm of the scarf over the injured arm and tie the scarf around the neck.



You can watch a video of these immobilizations at the following link:

<https://www.youtube.com/watch?v=5NSlhhyzJg0> (the video is called: First aid for drivers - Immobilization of the arm with a triangular scarf).

Immobilization of the legs is mainly done by tying the injured leg to the healthy leg. It is important to respect the rule of two, i.e. to always immobilize two adjacent joints - below and above the injury. Depending on the place of injury, we will estimate how many scarves we need to tie our legs, which can also depend on the constitution of the injured. When we carry out this immobilization, we should place some soft material

between the legs, for comfort. Important note: when tying the legs with triangle wraps, we must take care to move the injured leg as little as possible (instead bring the healthy leg closer).

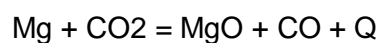


Слика 6.2. – Иммобилизација ноге уз ногу.

## TACTICAL APPLICATION OF APPARATUS FOR EXTINGUISHING INITIAL FIRE

### APPARATUS TYPE CO<sub>2</sub>

They are intended for extinguishing initial fires of class B, S and E. Carbon dioxide must not be used to extinguish metals (class D fires), such as magnesium, titanium, zirconium, strontium, uranium, plutonium and other metals. The reason for this is twofold; first carbon dioxide reacts with metals as seen in the example of magnesium.



In this chemical reaction, combustion is accelerated (faster than in air) and very poisonous carbon monoxide is created. Another reason is the thermal dissociation of carbon dioxide due to the high temperatures that accompany the burning of metals.

In addition to metals, metal hydrides should not be extinguished with carbon dioxide for the same reasons. Carbon dioxide cannot extinguish substances that contain oxygen in their composition (cellulose nitrate, etc.), as well as fires on people's clothing.

Norms for the tactical use of fire extinguishers with CO<sub>2</sub> extinguishers are shown in Table 1.

*Table 1: Tactical capabilities of CO<sub>2</sub>-type apparatus*

<b>Device type</b>	<b>Surface of splash extinguishing (m<sup>2</sup>)</b>	<b>Flame volume that the device successfully extinguishes (m<sup>3</sup>)</b>
CO <sub>2</sub> - hand-portable	0,65	2-5
CO <sub>2</sub> - hand-carried	0,65	18-60

Fire extinguishing with CO<sub>2</sub> type apparatus is mainly related to closed spaces. CO<sub>2</sub>-type devices can successfully extinguish fires in the open space according to their real capabilities only in the absence of wind. However, the presence of wind blows away carbon dioxide, which flows from the air and remains above the extinguished surface. The wind carries it away and the fire reignites, due to the presence of hot metal surfaces, red-hot coals or sparks, and bodies of low energy content.

For extinguishing initial fires with CO<sub>2</sub>-type apparatus, sufficient apparatus should be provided according to the size of the fire surface and the tactical capabilities of the specific apparatus. It is recommended to use three devices at the same time, as is the practice throughout Europe.

For a successful shutdown, all appliances should be started simultaneously. The jet from the CO<sub>2</sub> apparatus is directed at the base of the flame. If it is a flammable liquid, the jet of extinguishing agent is directed into the container at one point. If it is a larger area, the jet should be moved zigzag as shown in Figure 11.

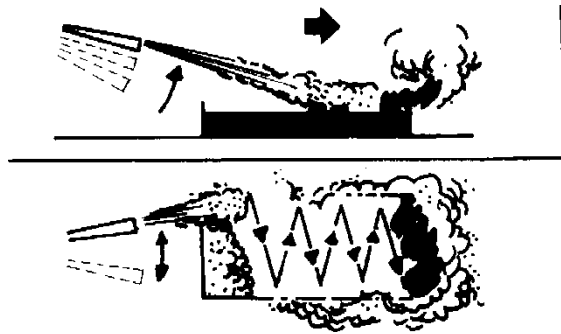


Figure 11: Tactical application of CO2 type apparatus

## APPARATUS TYPE S

They have an almost universal application in extinguishing initial fires. The norms for the tactical application of fire extinguishers with S devices are shown in Table 2.

Table 2: Tactical capabilities of the S-type apparatus

Device type	Surface of splash extinguishing (m <sup>2</sup> )	Flame volume that the device successfully extinguishes (m <sup>3</sup> )
S-6	1,7	6
S-9	2,83	9
S-50	15,0	50
S-100	30,0	100
S-150	45,0	150

Tactically important information is the surface area of the burning substance, i.e. the volume of the flame, which can be extinguished by one device. For powder as an extinguishing agent, it is necessary to bring the minimum necessary concentration for immediate extinguishing of the flame. Adding smaller concentrations will not extinguish the fire and it will flare up again.

When extinguishing a fire, the jet of powder is directed into the flame while evenly covering the burning surface from the front to the back of the fire; Figure 2. Powder is introduced into the flame; at its base from the beginning to approximately 1/3 of the flame height, across the entire width of the fire front.

Before starting extinguishing, it is necessary to provide the necessary and sufficient amount of apparatus depending on the burning surface (flame volume) and simultaneously start extinguishing from all apparatus surrounding the hot spot.

In an open area, extinguish downwind. When extinguishing spilled liquids, cover the entire surface of the flame with powder in the shortest possible time interval. Do not empty the appliances completely, because it may happen that the flame suddenly appears again.

Only when the fire is completely extinguished can the appliances be completely emptied.

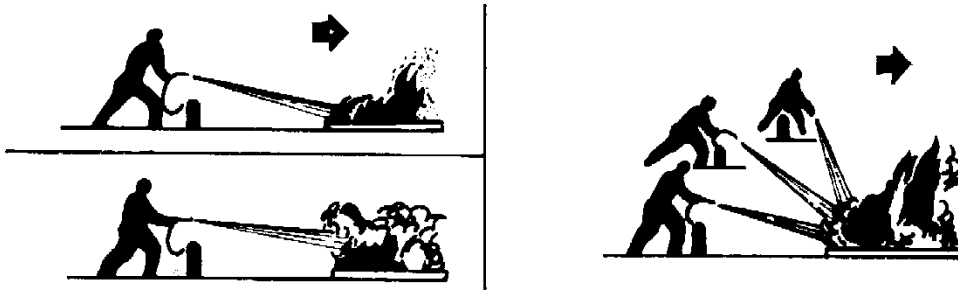


Figure 12: Tactical application of S-type fire extinguisher



Figure 13: Extinguishing with an S-type apparatus

#### EXTINGUISHERS TYPE HI and Fe

Apparatuses with halon and freon have almost the same application as type S apparatuses. The operator first hits the front edge of the fire from a safe distance and "targets" the entire width of the focal point. Stop ejecting the agent when the flame and glow have completely disappeared.

#### EXTINGUISHERS TYPE V, Vd, Vh, VP-15 and V-25

The extinguishing agent of this type of apparatus is directed to the focal point directly into the hot parts of the burnt surface with the aim of cooling as efficiently and quickly as possible. The



extinguishing tactics with this tool are shown in Figure 4. The direction of the wind must be taken into account and the tactical approach must always be from that direction.

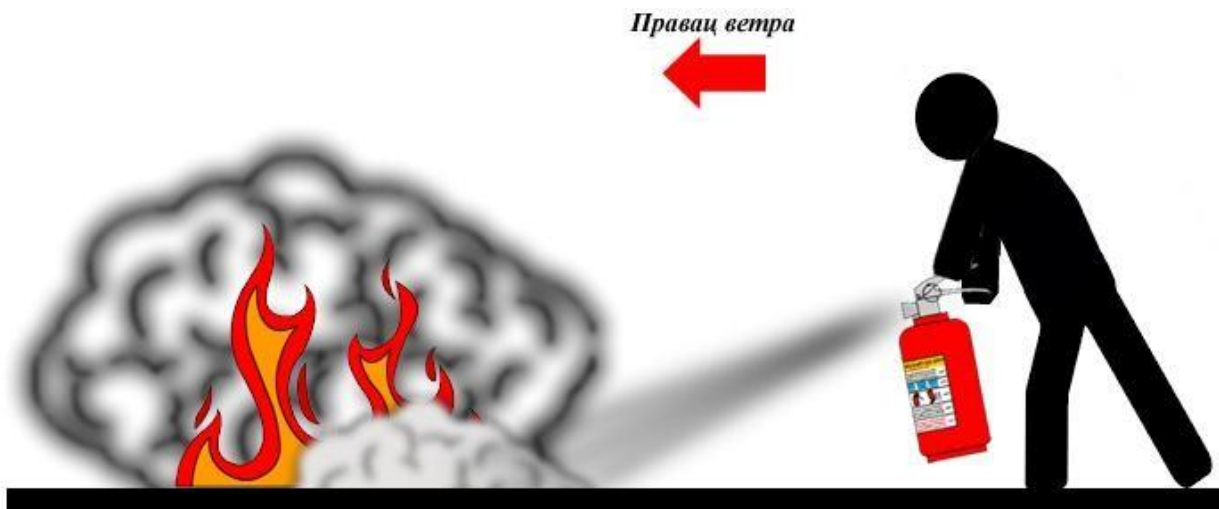


Figure 14: Extinguishing tactics with a type V apparatus

When extinguishing, always cover the entire area of the hot spot, as shown in the picture 5. It is useful to always use intoxicated water (water with at least 1% vol. Penil added). The results achieved are surprisingly good compared to pure water.

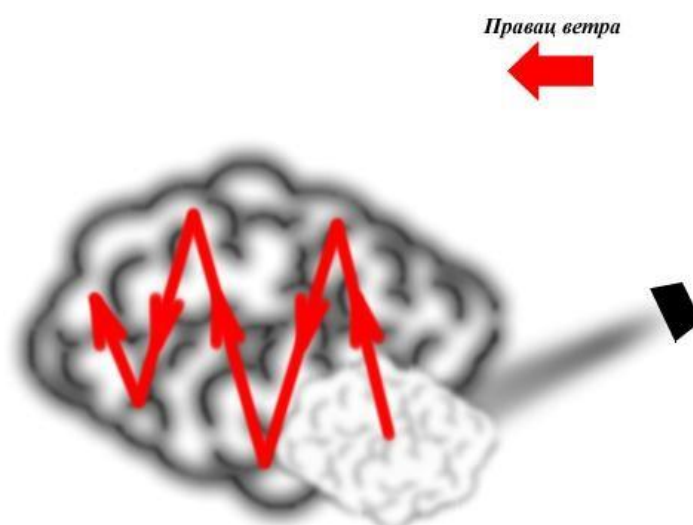


Figure 15: Tactics of covering hot spots with type V devices

#### PH, Pz, VP-15 and VP-25 TYPE DEVICES

Heavy foam as a class V fire extinguishing agent is always directed to hit the opposite wall and flows down it advancing towards the operator who hits the same point all the time until the flame is completely extinguished. It is also useful to apply foam for ten seconds after extinguishing the fire to prevent the flash-back effect.

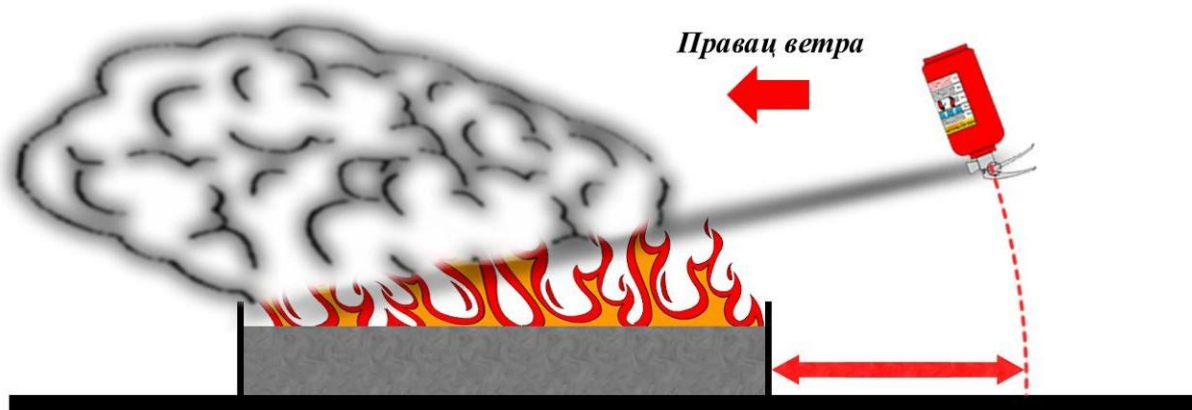


Figure 16: Tactics of covering hot spots with foam devices of type Ph, and Pz,.

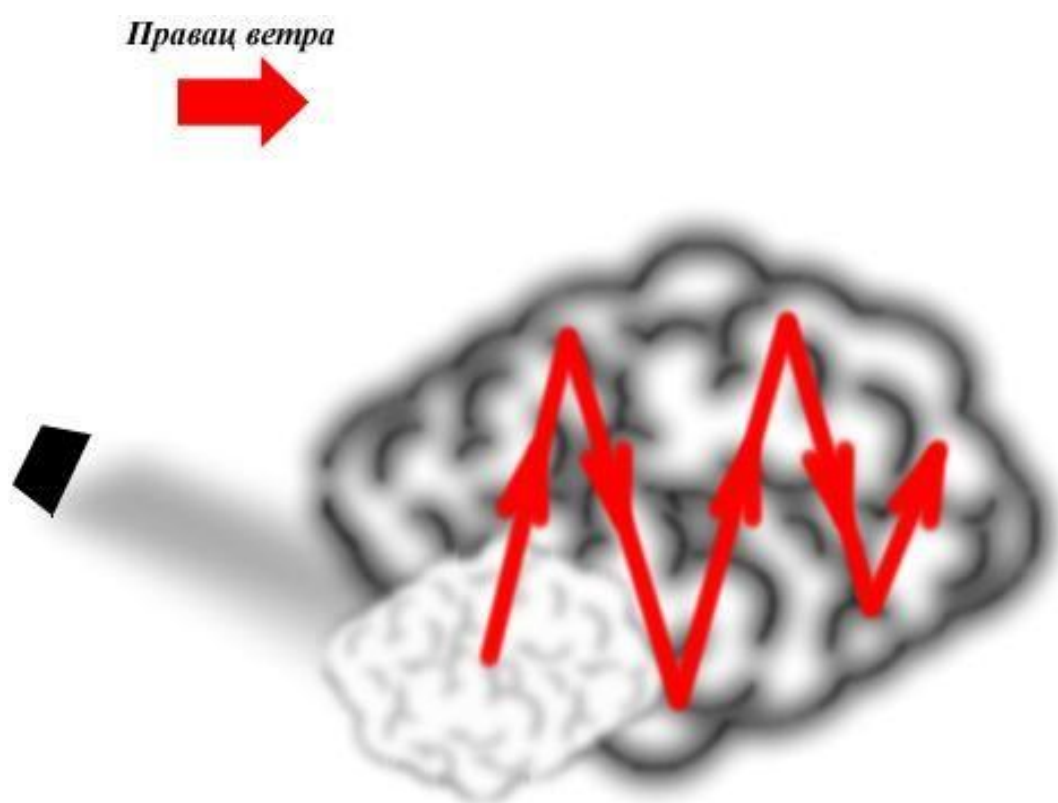
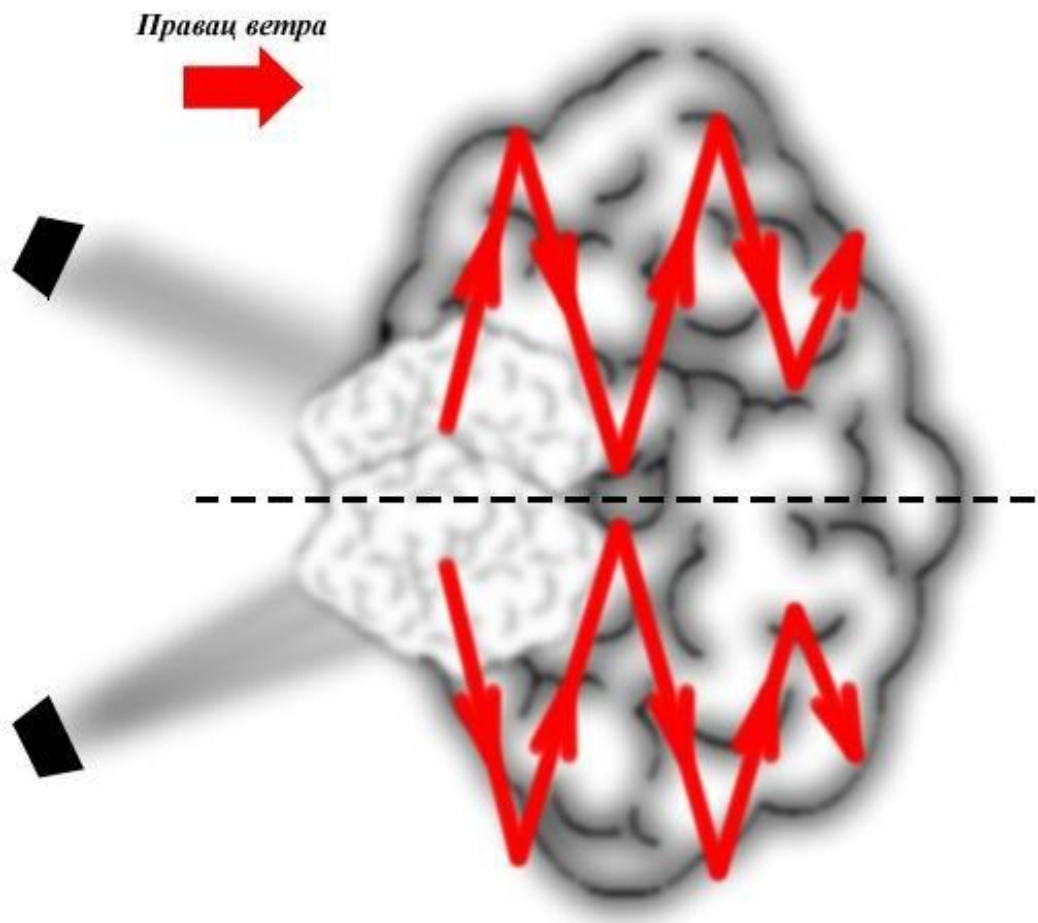


Figure 17: Tactics of covering a two-dimensional hot spot of spilled fuel on a solid surface with foam devices of type Ph, and Pz,

When it comes to solid fuel or burning liquid spilled on a solid surface, the heavy foam is directed as shown in Figure 7. If the focus is larger, several devices are used simultaneously. Each device and its operator extinguishes a specific segment of the burning surface. This part of the tactic is shown in Figure 8.



*Figure 18: Tactics of covering a two-dimensional hot spot of spilled fuel on a solid surface with apparatuses with foam type Ph, and Pz with the use of several apparatuses at the same time*

*Pz*

## CHOICE OF DEVICE TYPE

Special attention should be paid to the choice of the type of device. In this case, you should consider:

- combustible matter,
- speed of fire spread,
- the temperature of the burning substance,
- the presence of dangerous substances in the combustion process,
- danger of electric current,
- how to handle the device.

The burning material significantly determines the choice of the type of appliance. In most cases, not one, but several different substances burn. Usually, this multiplicity of combustibles cannot be extinguished with a single extinguishing agent. For example, water cannot extinguish substances that react with it, as well as substances whose combustion generates high temperatures. Carbon dioxide should not be used to extinguish metal fires, metal hydrides and substances that contain oxygen in their composition, which has already been discussed.

Combustible materials are classified into 4 classes according to their fire properties; A, V, S and D.

Class A fires are fires of solid combustible materials, which burn with flames, embers, and flames and embers. This class does not include combustible metals, which are also in a solid state. Means for extinguishing these fires are:

- water with or without additives,
- chemical and air-mechanical foam,
- special powder for extinguishing fires with embers,
- SO<sub>2</sub>, for Class A fires burning with flames,
- combined means,
- etc.

Class V fires are flammable liquid fires. Means for extinguishing these fires are:

- foams, all types,
- powder based on sodium bicarbonate,
- powder based on potassium bicarbonate
- powder based on ammonium sulfate,
- special powders
- halons,
- SO<sub>2</sub> – snow,
- combined means.

Class S fires are fires of flammable gases. Means for extinguishing this type of fire are:

- powder based on sodium bicarbonate,
- powder based on potassium bicarbonate
- powder based on ammonium sulfate,
- special powders,
- halons,

- CO<sub>2</sub> ,
- combined means.

Class D fires are combustible metal fires. Means for extinguishing these fires are:

- powder based on sodium chloride,
- powder based on potassium chloride,
- silica gel,
- special powders,
- powder mixtures,
- hand tools to reduce heat radiation in a thicker layer:
- dry and clean sand
- dry land
- clay,
- shavings of gray cast iron,
- zeolite,
- etc.
- combined means.

In addition to other fire hazards, there is also the danger of electric current. It can be present in every class of fire from A to D. Means for extinguishing fires in the presence of electricity are:

- powder based on sodium bicarbonate up to 1000 V,
- powder based on potassium bicarbonate up to 1,000 V,
- powder based on ammonium sulfate up to 1,000 V,
- special powders up to 1,000 V,
- halons up to 100,000 V,
- CO<sub>2</sub> – snow 1,000 V,
- combined means up to 1,000 V.

Based on the fire class of the combustible material, the type of appliance can be more clearly determined. The speed of the flame front spreading over the surface of the burning material is another important determinant that will determine the type of apparatus and its construction. Certain materials have very high flame propagation speeds, so in extinguishing fires, devices that are not under constant pressure cannot be used, because 5-10 seconds must pass from the moment of action on the activation lever to the start of extinguishing. During that time, the flame front went far from the starting position of the apparatus. In such cases, devices under constant pressure and a quick-acting valve are used.

In some cases, the high temperature of the burning substance makes it impossible to use all classic fire extinguishing agents and with them all appliances (class D fires). In such cases, temporary means will sometimes be applied.

The development of toxic substances in the process of extinguishing a fire is dangerous for the health of the person who handles the device. Some halons in the presence of fuel and elevated temperatures form phosgene (COCl<sub>2</sub>), which is dangerous to health in concentrations of 0.005% vol. Incomplete combustion; heterogeneous burnings are abundant with carbon monoxide (CO), which is deadly at concentrations of 0.5%, and when extinguishing fires with halons, it is also synthesized. When choosing the type of device, this component must be taken into account.

A new danger when it comes to extinguishing initial fires with appliances is electricity. Apparatuses are rarely operated by professional firefighters. In most cases, these are employed workers, passers-by and other well-intentioned people. If the voltages are higher than 1,000 V, the danger to the operators of the devices is significant and it increases dramatically with the increase in voltage. In such cases, devices of type N1 or CO2 must be used, depending on the magnitude of the voltage. Possible use of other devices is allowed only when the electricity is turned off.

In the end, the devices must be as easy to operate as possible so that no errors occur at this stage. Experiences from real fires have shown that some types of apparatus are not activated at all when trying to extinguish the fire, due to incorrect handling or improper sequence of procedures. An example of this is the Ph type apparatus, which in the extinguishing process should be turned to 1800. In any other position, the extinguishing agent will not be thrown onto the fire.

Another example are S-type devices whose handling is in two phases. The first push of the handle breaks the membrane and releases CO2 gas. In 5 to 10 seconds, working pressure is created in the device. Only after that the same lever is pressed again; for activation and a spray of powder is obtained.

The two basic handling errors are:

- by keeping the handle constantly pressed (CO2) goes into the atmosphere without creating working pressure in the apparatus,
- immediately after breaking the membrane, press the handle (too soon) so that a very small working pressure is created in the apparatus, which will result in a small amount of powder being directed into the fire.

From the above, it can be seen that, in combination, two devices with equal characteristics in terms of the ability to extinguish fires and the safety of the operator should choose the one whose handling is simpler. For example, a 10-second wait is a difficult problem for a panicked operator while preparing for the first attack on a fire. Very few sane people will accurately determine those important 10 seconds and allow the device to be discharged into the fire to the end - that is, throwing the entire device into the fire.

By analyzing the mentioned factors and eliminating inadequate and inappropriate devices, we arrive at the type of device that is optimal for protecting the specific space.

Of course, the price of the device as well as the price of the service and the possibility of servicing are included in the analysis of the choice of the type of device.

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In case of any complaints, contact: [romania-serbia@interreg.eu](mailto:romania-serbia@interreg.eu)

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