

Original article

Utilization of the territorial defense force in rescue operations (part 2)

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ABSTRACT

This is a second part of the article in which the authors attempt to present the courses of action of the Territorial Defence Forces' subunits in the conditions requiring the support of state and territorial administrations when life of residents is jeopardized as a result of catastrophes and natural disasters. This is one of the key tasks faced by the newly established Territorial Defence Forces (WOT) that is the protection of people and property within the activities unrelated to the kinetic impact of potential enemies.

KEYWORDS

territorial defence, salvage service, rescue operation, search for victims, fires, medical assistance, reconnaissance



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1. Searching for victims

This task should be entrusted to engineering and technical reconnaissance patrols. They search for the affected population “trapped” under the rubble of shelters and residential buildings while marking these places. While moving forward through piles of debris, patrols search them all the time to find the victims who have been covered up and listen to the sounds of people calling for help. Contacts with people under ruined shelters or buildings can be established by calling or knocking on the wires and building elements carrying sound. Tapping and responding to sounds should take place with at least a 5-second delay [Bozek and Ciesla 2002, p. 142].

The operation must be decisive but also prudent, taking account of the condition of the damaged structures and the rubble instability. When searching for victims, they must support and assist each other. It is crucial when searching upper building floors, where stairways may collapse under the influence of small loads. The removal of all kinds of obstacles in the form of beams, slabs, and other building structure elements,

as well as electric wires and water, gas and sewage pipes can only take place when it is certain that it will not pose a threat to the rescuer and will not worsen the situation of the victim [Bonislawska 2012, pp. 120-121; Bozek and Ciesla 2002, p. 142-143]. During field operations, patrols continuously carry out reconnaissance interviews with the surviving population, exchange information obtained with patrols of other formations and services operating in the damage zone, as well as confront their knowledge with messages collected from people who had been rescued and those who had freed themselves. The information obtained from the Civil Defense patrols that operate specialist equipment, which significantly increases the effectiveness of rescue teams' operations, may be of value. After receiving even incomplete but confirmed data about the injured population located on the territory of the reconnaissance patrol, the patrol commander immediately submits the report to the reconnaissance subunit commander, who, in turn, reports on the results of the diagnosis to the supervisor who decides on further action [Bozek and Ciesla 2002, p. 143].

2. Rescuing victims

Because of modern means of destruction, the urban infrastructure is destroyed, creating gobs. The primary duty and condition for the efficient rescuers' operation is the knowledge of the types of rubble characteristic of a given structure and places where victims can be found, as well as the expertise of the rules and methods of reaching them. The right and recognized principle – **“access should be made in the shortest possible time with minimal involvement of forces and technical means”** – imposes the necessity of individual assessment of debris and selection of the most suitable way to provide the access [see: *Zasady organizacji...* 2016; Bednarek and Marciniak 1995].

In any case, however, the account must be taken of the following [Bozek and Ciesla 2002, p. 143]:

- equipment (technical means available),
- the level of training (ability to use technical equipment),
- the condition of the injured (the type of injury),
- the number of victims awaiting help.

Works related to paving ways should be performed only to such an extent that is necessary for recovering people. The method of reaching the debris of a collapsed building structure or a basement, thereby people trapped there, will largely depend on the size and type of rubble, the kind of construction and materials from which it was made.

When choosing the right way to reach the victims, all possible options, from the simplest to the most complex ones, must be considered according to the following scheme [Ciszewski 2011, p. 379; Bozek and Ciesla 2002, p. 144]:

- checking whether it is possible to unblock and open the entrance door of the protective building structure or basement,
- considering the possibility of clearing of the rubble at the alternative exit in the case of a shelter,

- providing access to the building or basement through adjacent, not rubble basements and holes in the wall,
- breaking through the ceiling of the protective building or basement after completing the clearing,
- breaking through the walls of the protective building or basement (load-bearing wall) after completing the clearing.

In the case when all these methods are unreliable, decision should be made on the execution of [Bozek and Ciesla 2002, p. 144]:

- a) pavements in the pile of rubble,
- b) making underground passages in the ground:
 - horizontal pavements,
 - horizontal pavements with vertical shaft,
 - diagonal pavements.

This method of reaching the victims is used as a last resort since making digs requires a lot of work. It appears to be necessary most often in the case of a thick layer of debris on the home ground, at considerable distances from the external walls.

3. Providing first pre-medical aid

The progressive industrialization and urbanization as well as the possibility of the destructive influence of natural forces cause permanent threats to life and health. The war period intensifies this threat through the deliberate action of man. Based on the observations of the occurring events, it can be concluded that the lives of many people would have been saved if only the first pre-medical aid had been provided to them timely. The treatment of such an injured person can take the form of a chain consisting of four essential elements [Bozek and Ciesla 2002, p. 145]:

- diagnosis of the situation and undertaking the necessary ad hoc activities (restoration and maintenance of circulation and breathing, stopping hemorrhages, etc.),
- providing first pre-medical aid,
- transport,
- medical (hospital) help.

Training of troops in aid delivery should include the first two elements of the chain, namely [Bozek and Ciesla 2002, p. 145]:

- recognition of the situation, i.e. securing the working sites,
- evacuating the injured from the place where further stay creates a threat,
- restoring or maintaining basic life functions in the injured,
- continuing to provide first aid until the injured have been taken under the care of medical services.

The first pre-medical aid given to the victims increases the chance of survival and prevents the deepening of injuries and the complication appearance. It should be remem-

bered that when the circulation and breathing are stopped, the time for effective rescue operations is very short and amounts to about 4 minutes. Therefore, it is crucial to provide first pre-medical aid to victims who are in hard-to-reach places¹.

4. Locating and fighting fires

Modern warfare is characterized by the frequent occurrence of fires that arise as secondary effects of the use of conventional weapons and, above all, incendiary devices. The phenomenon of fires is dealt with in time of peace. Forest fires are particularly dangerous when they take the form of natural disasters. Fires set in forests, settlements, and cities, apart from material damage, may cause personal injury. These losses also apply to troops that should be adequately prepared to fight fires and carry out any activity related to fire prevention, both during peacetime and on the battlefield [Bozek and Ciesla 2002, p. 146].

The TDF will perform locating and fighting fires in forests, towns/cities, etc. The flames should be found and nipped in the bud, thus preventing their spreading into large areas. During the rescue operation, the extinguishing action should be carried out in the entire endangered area, with an emphasis on conducting rescue work related to helping the injured. The location of the fire is aimed at limiting its spread and constitutes the first stage of action.

During combat operations of troops in forest regions and localities, especially during periods that pose a high fire hazard, the necessary forces and measures to eradicate fires should be provided for and separated. The existing communication network can be used to inform them to develop fire-fighting activities. During military operations, fires in forest complexes, densely-built cities, and arable fields will most often arise. In the case of fires, firstly the evacuation of troops and people from hazardous areas must be commenced, and secondly, the flames should be localized and extinguished since they hinder the execution of combat and rescue tasks and posing a threat to depots and bases.

The methods of combating fires will depend on [Bozek and Ciesla 2002, p. 146]:

- the type of fire,
- the size of the existing fire hazard for operating troops,
- available forces and extinguishing agents.

The decision as to the manner and scope of the extinguishing action is made by the commander whose troops operate (are deployed) in the threatened area. The primary methods of combating fires in forests and localities by the armed forces include:

- the use of extinguishing measures,
- execution of fire barriers or fire belts,
- the use of combined forms of action.

¹ For more about providing first pre-medical aid [see: Gugala 2009, p. 171-188]. In the concepts of training the TDF subunits it is postulated to put a lot of emphasis on medical courses at various levels of advancement [see: Grzegorzolka 2017].

Fire barriers are made in high-flammable coniferous pine forests as the final defense lines in the event of a fire slipping out of control or inability to direct larger forces to fight it [Wiler and Wcislo 2013, p. 179].

Fire belts are made in forest areas especially exposed to the occurrence of fires, i.e., at railway routes, public roads, mid-forest parking lots, industrial plants, storage facilities, military training areas, army exercise areas and public facilities [Wiler and Wcislo 2013, p. 156]. They are carried out so as to isolate the area covered by the fire from the unburned area, in front of the fire, at a distance ensuring the completion of work before the fire front reaches the area of operation. Fire breaks and belts are used to combat fast-spreading fires in forest complexes and housing estates. Depending on the terrain conditions, they can be performed with trench equipment, mechanical saws, ground machines or in the explosive way. For the purpose of conducting a rescue operation, firefighting sections and sub-sections covering single fires, block fires and even the front line of fires separated in the sector. The TDF sub-units used for firefighting will [Bozek and Ciesla 2002, p. 147]:

- conduct fire reconnaissance,
- evacuate people from areas at risk of fire,
- aim to stop a fire at a certain boundary and prevent further fire spread,
- eliminate fires in the area most at risk.

The sub-unit commander organizes fire reconnaissance after arriving at the fire site to determine [Bozek and Ciesla 2002, p. 148]:

- places where people are cut off by a fire and need immediate help,
- water sources (water intakes),
- the direction of fire expansion and its intensity,
- the boundaries of fire and its size,
- the type of building in the area covered by the fire,
- ways of reaching endangered people and their evacuation.

In the case of fire-fighting activities, the TDF troops will play a supportive role in favor of the fire brigade².

5. Clearing rubble, allowing a passage and performing access to objects of rescue works

Preparation of the number of streets appropriate for the movement of rescue forces in the danger zone, delivery of supplies, and evacuation of the victims is a complicated undertaking, resulting from the complexity of the urban transport infrastructure. Ensuring permeability in such the area consists in [Ciszewski 2011, p. 379; Bozek and Ciesla 2002, pp. 148-149]:

- reconnaissance and adaptation of the least-rubbled streets to the needs of the traffic,

² Fire protection is an integral part of the National Security System [see: Zboina 2015, pp. 76-77].

- execution of passages in the rubble streets,
- elimination of the threat to traffic along designated routes by securing damaged buildings (pinnacles and other elements of uncertain stability),
- marking cross-country roads (through green areas, squares).

Performing access to sections or objects of rescue works includes [Bozek and Ciesla 2002, p. 149]:

- execution of a bypass or a detour of section under debris,
- removing gobs from the crown of the road,
- execution of passages on the top layer of debris.

Due to the high labor intensity associated with clearing rubble from streets and performing passages on the debris, consideration should be given to the possibility of making a bypass or detour. If such a possibility exists, it must be executed even when the detour route will be significantly longer.

Clearing gobs from the street surface or making passages on its top layer should only be conducted when the section under debris cannot be bypassed and it is necessary to reach the site of rescue works.

It is only advisable to remove rubble off a part of the road if the rubble covers its short section of up to 50 m and its height does not exceed 1 m. Streets will usually be cleaned mechanically using bulldozers and graders [Bozek and Ciesla 2002, p. 149].

When there are gobs on as significant part of the road and their height is over 1 m, it is advisable to perform the passage on the debris. In this case, the works are limited to leveling and compacting the rubble, preparing it first for tracked machines, which then is perfected for wheeled vehicles.

The road that is prepared, cleared and designed for one-way traffic should have the width of about 3 meters. To improve traffic conditions along one-way roads, extensions (turnouts) are to be prepared every 250-300 m. They should be planned on straight sections with good visibility, allowing the drivers to be noticed, ensuring collision-free passage.

The TDF will not carry out works related to debris removal and ensuring passages and access to facilities by itself, but only fulfill auxiliary and supplementary functions as part of cooperation with the Civil Defense [Bozek and Ciesla 2002, pp. 148-150].

6. Interim protection or demolition of buildings and structures threatening to collapse in the rescue operation area

Various degrees of destruction may affect buildings and structures in the damage zone. Some of them may have a disturbed structure to the extent threatening the collapse with the even small external forces acting. Securing damaged buildings or their fragments against collapse aims at [Bozek and Ciesla 2002, p. 150]:

- enabling rescue forces to reach safely the working site,
- increasing the work safety of all participants the rescue operation,

- safe removal of the injured population from the hazardous area.

Among damaged buildings only those are secured that are within [Bozek and Ciesla 2002, p. 150]:

- access routes for rescue units,
- passages to protective buildings and other construction objects,
- supply and evacuation routes,
- facilities (places) for rescue work.

In situations where the building is unsuitable to be protected and poses a threat to the safety of rescuers' work or otherwise hinders the rescue operation, it must be **demolished** or **dismantled**.

Dismantling is carried out when the demolition works would endanger the safety of people in the building or cellar under debris. Dismantling should be understood as disassembly of parts either manual or using technical means, starting from the top and performed in such a way that – systematically reducing the load – prevents any structural elements from collapsing. The order of demolition works should be carried out in reverse order in relation to the construction, while maintaining the basic rule: **“demolition of a part or a part of the building must not affect the stability of the entire building”** [Bozek and Ciesla 2002, pp. 150-151].

Demolition should be carried out where possible (instead of dismantling), and especially when [Bozek and Ciesla 2002, p. 151]:

- there are no people under/in the building or basement,
- there are no injured people waiting for help under the debris of demolished buildings.

Demolition of objects with shelters underneath or when there is a probability that people are alive in the rubble is carried out provided that:

- it will not worsen the current conditions of the injured,
- it will not extend the rescue operation.

During the rescue operation, partial demolition will usually take place, covering minor parts of buildings. The decision on the total demolition will be taken during the reconstruction period.

Demolition during a rescue operation can be [Bozek and Ciesla 2002, p. 151]:

- manual,
- mechanical,
- using explosives.

Manual demolition – consists in using the simplest means, such as a rope with an anchor, grapnel, etc., to catch a part of the building and overturn it with manual force applied.

Mechanical demolition – involves the direct use of the power of machines with movable booms, enabling the removal of the demolished building fragment from the state of stability by stretching or pushing.

Demolition using explosives – can be undertaken in the following cases:

- the need to significantly accelerate engineering and technical work,
- performance of fire breaks,
- overturning dangerous pinnacles or other fragments, if this does not endanger the rescue operation participants and the population in the building being demolished.

Implementation of works related to the protection or demolition of damaged buildings threatening to collapse will most often be implemented during the war as part of cooperation with the Civil Defense formations. Regardless of the above, the TDF should be able to realize those tasks on their own.

7. Removing and disposal of unexploded ordnance

To clean up areas from explosive and dangerous objects, mining clearing patrols are organized³. The basis for their operation are reports of reconnaissance patrols operating in the endangered area, which mark the places of detected explosive and dangerous objects with the use of warning signs, at the same time protecting them against the entry of rescuers and other people. In the case of numerous notifications and a limited number of mining patrols, the order of removal of explosives and dangerous objects is determined by the person leading the rescue action. He/She is guided by the principle of first directing mining clearing to the places where the presence of these objects stops and hinders the rescue operation, poses a threat to the injured and rescuers, as well as on the routes of transport and evacuation [Bozek and Ciesla 2002, p. 152].

8. Protection of order and movement regulations and protection of remained property

Rescue operations can only achieve their purpose if they are well organized and run quickly and efficiently. The basis is to ensure order and safety on the rescue section. To this end, clearing and protective service is organized in the composition of which posts and patrols are included. The TDF infantry subunit organizes posts and patrols, primarily for protecting social property, maintaining order in medical facilities and preventing the affected population from moving to the working site and the contaminated area. Soldiers carrying out tasks concerning maintaining order and protection of property should enjoy the same rights as guards and patrol service [Bozek and Ciesla 2002, p. 153].

The TDF infantry subunits involved in securing and protecting order in the zone of rescue operations must be prepared to block the return of the population to the dan-

³ For more about the actions of mining clearing patrols [see: Gryko 2011, pp. 8-21].

gerous area. Such situations may be the effect of the nervous shock, the desire to help the nearest ones under the rubble, as well as the recovery of lost property.

For the actions to be effective, the subunits should be acquainted with the methods of organizing appropriate forms as well as trained and coordinated in action. Blocking formations developed in special cases will be:

- single cordons with hands tied,
- single cordons with hands doubly tied.

A single cordon with hands tied is a formation in which soldiers stand side by side in line, at the distance of two lengths of outstretched arms, face in one direction and hold each other's hands.

A single cordon with hands doubly tied is a formation in which soldiers with numbers one hold hands in front of the soldiers' torsos with numbers two. Soldiers with numbers two hold hands in front of the soldiers' torsos with numbers one.

Conclusions

Rescue operations of the TDF troops are a complicated and time-consuming task⁴. Nevertheless, it is this formation that is to support all rescue and civil protection entities in the event of an armed conflict. The opponent will strike the defensive infrastructure of the state, often in the close vicinity of large groups of civilians.

The TDF 's preparation and participation as part of the rescue-protective and humanitarian functions should belong to one of various tasks imposed on this formation. Therefore, it should be incorporated into the legal framework for participation in such activities.

The strong point of using this formation is the speed of mobilization, joining the actions and involvement of TDF soldiers in defense of their own land. The negative one may be a legislative process, i.e., giving them legal competences of participating in such activities and supplying them with necessary technical equipment.

In the TDF training programs, the problem of rescue operations should cover the entire spectrum of threats in peace and war times, and the training itself can be organized based on the National Fire and Rescue System. Inclusion of such a large formation will strengthen the National Security System, and the TDF troops training together with the system units will become acquainted with unified procedures of rescue operations undertaken in situations of threats to life, health, property or the environment.

The article provides the schemes of operation in individual rescue actions. However, these are not strict rules of conduct. Procedures change, but the overall framework is

⁴ How many people and equipment were deployed by the armed forces to prevent and deal with the effects of flooding in the country in 2010 [see: Ciszewski 2011, p. 375]. The TDF troops in the implementation of rescue operations should be integrated into the subsystem of rescue and civil protection. This subsystem has been discussed in detail [see: Michailiuk 2013, pp. 274-292].

constant [see: Ciszewski 2011, pp. 372-373]⁵. What is more, the procedures will not always be followed up to the end during a crisis.

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Author contributions

All authors contributed to the interpretation of results and writing of the paper. All authors read and approved the final manuscript.

Ethical statement

The research complies with all national and international ethical requirements.

ORCID

Marek Pytel – The author declared that he has no ORCID ID's

Mariusz Ciesla – The author declared that he has no ORCID ID's

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⁵ The Territorial Defence Force can operate in crisis situations according to three phases.

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