

IX. Évfolyam 2. szám - 2014. június

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EXTREME WEATHER PHENOMENA 2. THE PROCESS OF REMEDIATION

Abstract

The effects of climate change caused by global warming have been increasingly perceivable in our country in the past few years. Extreme meteorological phenomena, such as gale force winds, flood-like rains, blizzards and exceptional fluctuation in temperature have become frequent. Unfortunately, these sudden changes of weather cannot always be predicted in advance so their occurrence may cause serious damages. The increase in the number of technical rescue operations of this kind require an increasing level of preparation by the fire departments and other organisations involved in remediation, constant development of their equipment and it becomes necessary to apply recent technical rescue tactics. The remedy of such a case of damage is an especially complex task. What are the most important conditions of the joint, complex remediation? In what order is it useful to perform the rescue operations? What tasks are the various organisations to perform? Authors of this article seek answers to the above questions.

A globális felmelegedés okozta klímaváltozás, az elmúlt években egyre jobban érzékeltette hatását hazánkban is. Gyakorivá váltak a szélsőséges időjárási jelenségek, a viharos szél, az özvívyszerű esőzés, a hóviharok, az extrém hőmérsékletingadozások. Sajnos ezek a hirtelen időjárás-változások nem minden esetben jelezhetők előre, ezért a bekövetkezésük komoly károkozással jár. Az ilyen jellegű műszaki mentések számának emelkedése a tűzoltóság és a kárfelszámolással foglalkozó szervek egyre fokozottabb felkészültségét, a szakfelszerelések állandó fejlesztését, valamint az újabb műszaki mentési taktikák alkalmazásának szükségességét igénylik. Egy ilyen káresemény felszámolása rendkívül összetett feladat. Melyek a közös, összetett kárfelszámolás legfontosabb feltételei? Milyen sorrendben célszerű a mentést végezni? Milyen feladatok hárulnak az egyes szervezetekre? A fenti kérdésekre keresik a választ e cikk szerzői.

Keywords: *extreme meteorological phenomena, flood-like rain, gale, heat wave, extreme cold, blizzard, remediation of damages ~ szélsőséges időjárási jelenségek, özvívyszerű eső, szélvihar, hőség, extrém hideg, hóvihar, kárfelszámolás*

COMPLEX TECHNICAL RESCUE OPERATIONS

The preparation of remediation

Recently these extreme phenomena have caused serious damages in our country and the elimination of the consequences has constituted difficult and complex technical rescue tasks.

[1] Through the analysis of the catastrophe situations that have most frequently occurred in the recent past and the operations performed in order to eliminate the consequences, it has become perceivable that the phenomena tend to occur at higher intensity; intervention is necessary at several venues at the same time; several organisations may need to coordinate their activities.

[2]

Large emphasis must be laid on prevention; unfortunately, the catastrophe situations caused by the extreme meteorological phenomena cannot be prevented (meteorological catastrophes) but it is possible to prepare for rapid and complex remediation and mitigation of the damages.

[3]

In most cases, remediation is performed by units of the professional organisations specialised in the elimination of damages (e.g. the fire department) with their own equipment; however, the municipalities and the citizens are obliged to help defence works.

The fire-fighters intervene with their special fire engines and professional equipment. In case of this activity, the efficiency of coordination is of crucial importance, just as the expertise and experience of the personnel performing the intervention. The elimination of the damages starts the moment the report is received. Reports are received by the county operations management centres or, in case of Budapest, the metropolitan operations management centre. The decision regarding the determination of the alert level is largely dependent on the types of information the responsible person (operations management officer) receives from the reporter of the event and the experience he already has from earlier remediation activities.

The reporter of the event must be questioned in a targeted way about all the important information related to the incident because the lack of these data may result in sub-optimal alert level, which in turn will later impact remediation.

Of course we often cannot get an answer to all of our questions because reporters of the incidents are nervous, tend to rush and hang up too early. After evaluating the report, instructions are given to the relevant remediation unit, where the forces and equipment are alerted.

When the alert is issued, the following factors must be considered: size of the endangered zone, life danger, evacuation tasks and the extent the elements of critical infrastructure is jeopardised.

After the incident has occurred, a report can also be made at the mayor's offices. This is what often happens in smaller settlements. In many cases, especially out of office hours, reporters contact no other than the mayor. Following a quick on-the-spot survey, if the extent of the damages justifies it, the mayor must contact the professional remediation organisations. It is very important that the Mayor's Office should have a list with the contact information of the professional organisations involved in damage elimination and those of the local security committee members. Copies of the forms recording the basic data must also be retained here. If the Mayor's office receives the report, the defence officer in charge is in a decision-making situation immediately after reporting the case because he/she must determine if there is enough time to wait for the professional units or if urgent action is required. In certain obvious situations when fast intervention seems unavoidable (defence works affect several settlements, the professional units are overburdened and they cannot start remediation activities within a short time), damage elimination actions must be started.

The steps of remediation

After the alert has been initiated, the units have to approach the venue of the incident using the shortest route. After arriving at the venue of the incident, the commanding officer performs the duties of controlling the rescue operations with sole responsibility. When arriving at the venue, the fire engines must be parked at a safe place where the vehicles suffer no damage, otherwise they could not be moved and deployed later on. First of all, before determining the tasks, a thorough and broad survey must be conducted, considering the nature of the incident, wearing the appropriate protective clothes.

During the survey, special attention must be paid to the following:

- Establishing the necessity of personal rescue; the number of endangered persons must be determined,
- Based on the visible signs (damages to buildings, excess water, fallen trees, snow-drift, etc.), the expectable consequences (danger of fire or explosion) must be determined
- The condition of the public utilities,
- Whether further information from or assistance by the providers of public utilities is needed,
- The determination of the possibilities of enclosing the dangerous zone (declaring it a closed area),
- Whether it is necessary to stop or divert traffic,
- Evacuation in case of populated areas.

After performing the above survey, the tasks can be determined and the remediation of the damages can be started. In case of incidents affecting a vast area, the partner organisations must also be involved in the procedure.

The most important tasks of the police include securing the closed areas and directing the traffic on alternative routes.

Civil protection has a role in organising the possible evacuation and ensuring the availability of shelters for the evacuated population.

In case of incidents involving collapsed buildings resulting in multiple injuries or mass catastrophes, the special rescue organisations must be deployed in addition to the ambulance.

It is advisable that the fire department and the other organisations participating in the rescue operations should perform the rescue tasks with extreme attention and in the previously agreed order of precedence. The tasks of the various organisations must be clearly established, as well as the issues of control and communication. The leader of the rescue operations controls the partner organisations operating on the venue of the incident through his unit commanders.

In many cases, the interventions must be performed under extreme conditions. These incidents usually result in extreme circumstances, thus the remediation of such incidents is not performed the usual way. It is extremely important to preserve the physical integrity of the personnel performing the intervention so the safety rules must be observed. [4]

FLOOD-LIKE RAINS

Flood-like rains typically mean that an extreme amount of precipitation fall within a short period of time, which the canal system is unable to manage so the accumulated rainwater occurs as excess water in several parts of the populated areas. The excess water can be drained using trenches and pumps in many places; however there may be parts of the town where protection will involve using sandbags. If the precipitation occurs outside the populated areas, trenches must be used to prevent the water from affecting populated areas. [5]

The major steps of protection are as follows:

- Prevention of immediate danger of life and accident risk,
- Tasks of protection and value preservation,
- Getting the equipment (sand, sandbags, hand tools, etc.) needed for protection to the venue,
- Ensuring the drainage of water,
- Ensuring the continuous operation of the transportation equipment and the machinery,
- In case of lengthy remediation operations, ensuring the supply and recreation of the intervening forces,
- Other logistics tasks,
- Continuously providing information to the population; evacuation if necessary,

GALE-FORCE WINDS

In most cases gale-force winds can be predicted so the population must be informed in advance about the preventive measures. It is a typical characteristic of gale-force winds that they make their impact in relatively shorter periods of time, uprooting trees, tearing off roofs, damaging the electric and telephone network and causing accidents both on the railways and the roads. Remediation activities are mostly performed by units of the professional organisations but municipal governments and the population also play an important part in the mitigation of damages.

The most important tasks of protection are as follows:

- The intervention must be performed while continuously monitoring the changes on the venue and without endangering the physical integrity of the personnel,
- Immediate danger of life must be eliminated in all cases and the affected people must be placed in safety,
- Continuous communication with providers of the public utilities,
- Prevention of unwanted conditions,
- Ensuring the logistic background, transportation vehicles, other machinery and devices,

HEAT-WAVES

Besides many other factors, the Green Book issued by the European Committee draws the attention to the health damaging effects of heat-waves. Therefore, in order to protect the population, it is especially important to elaborate a program of measures for the event of heat-wave alerts.

Attention must also be paid to the risk-free organisation of outdoor sports events and other programs during heat-waves and the health prevention of people working outdoors, including the supply of water, relaxation in the shade and the proper work clothes.

Regarding the environment and environmental health issues, priority is given to such public utility and communal services that may favourably or unfavourably impact not only the quality of the environment but also the life conditions of the population during heat-waves. [6]

Regarding the supply of electricity, the needs of all consumers can be satisfied including a 2-3 hours long shutdown at the time of heat-waves. As Hungary is a transit country, the dangers

affecting the transportation sector must also be considered in case of heat-waves. The railways, the motorways and the public roads can all be sources of risks.

The frequent removal of communal waste is important during heat-waves because this way we can prevent the danger of infections.

In most cases heat-waves can be predicted so the population must be informed about the preventive measures in order to preserve health.

Tasks related to the elimination of damages include:

- Attention must be paid to the reports issued by the Meteorological Service and statements of the National Public Health and Medical Officer Service (ÁNTSZ),
- Continuous information provided to the population, which must include the necessity of consuming ample amounts of liquids, staying in shaded areas and the dangers of leaving their homes,
- Ensuring the liquid supply and, if needed, medical supervision of the personnel performing the intervention,
- In case of high daily average temperatures for longer periods, continuous communication with the providers of drinking water in order to ensure the appropriate supply of water for the public organisations and the civil population,
- Ensuring drinking water for the injured and affected in case of mass accidents,
- Releasing the drinking water reserves,
- Operation of vehicles transporting drinking water and distributing drinking water to the population at the assigned venues,
- Continuous operation of watering carts along the most important routes,
- Opening the air-conditioned facilities for the population,

EXTREME COLD AND BLIZZARDS

It is a typical characteristic of blizzards that they make their impact in relatively shorter periods of time and, if they are accompanied by lengthy periods of cold weather, they damage the electric and telephone networks, may cause disturbances in district heat and drinking water supply, while stoppages and accidents may occur on the railways and highways. In most cases, the possible damages may be reduced by way of careful preparation.

Tasks related to the elimination of damages include:

- Following the reports issued by the Meteorological Service,
- Continuous information provided to the population in order to prevent accidents,
- Using the best all-terrain vehicles to approach the venues of damages,
- Continuous communication with the road management organisations and the partner organisations (army, police, ambulance),
- Provision of warming rooms and protective drinks in cooperation with the municipal governments,
- Preserving the serviceableness of the transportation vehicles, machinery and other equipment; ensuring the logistic background.

SUBSEQUENT PROTECTIVE OPERATIONS

The protective operations must be continued until the amounts of water, debris, fallen trees, etc. present in the affected area no longer significantly obstructs normal use and everyday life.

Any unneeded construction materials must be transported from the affected areas to assigned storage areas. Useable wood and iron materials must be cleaned. The devices, tools and equipment handed out must be recorded, and their status and further usability must be established. The proper condition of the equipment is the basis of continued successful protection!

The area must be cleaned of all such materials that were placed there during protection operations. The materials that became waste must be handled accordingly. It is very important that materials considered hazardous (oil, lubricants, remnants of fuel, oily cloths, etc.) should not be mixed with communal waste but collected separately and it is best if they are kept in containers according to their level of hazardousness.

SUMMARY

As a result of global climate change, the effects of extreme meteorological phenomena can be increasingly experienced. However, in order to ensure the efficiency of remediation, the necessary preventive measures must be taken and we must prepare for possible protection.

Complex technical rescue operations become truly efficient if the elements of the system are selected and applied according to the purpose.

In order to make sure that the complicated procedure of remediation leads to the desired results within a short period of time, the following factors must be present at the same time:

- Sufficient number of appropriately prepared intervening personnel with the necessary protective equipment,
- Properly operating devices,
- Efficient cooperation and communication between the organisations participating in the rescue operations,
- Ensuring the logistic background.

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