

## A Devastating Tornado in Moravia in 2021

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### Abstract

This article deals primarily with the protection of the population in the Czech Republic, as it is a very important security area of the highest priority. The population protection system in the Czech Republic is briefly explained, which has been fully under the responsibility of the Ministry of the Interior of the Czech Republic since 2001, but a number of other central administrative authorities (ministries, special institutes and institutions, research institutes) are also involved in its implementation. In addition to legal standards and implementation decrees, the Czech Republic security strategy and the concept of population protection are also presented. A separate part is devoted to the last valid Population Protection Concept from 2021, and it is emphasized here that the concept places great importance on the population's preparedness for dealing with extraordinary events and crisis situations. The Model Action Activity of the Integrated Rescue System in the Czech Republic is presented in the next section. Although many model action activities have already been published in the Czech Republic, unfortunately such a safety management plan has not yet been published for the extremely hazardous natural disaster „Tornado“. This subsection briefly explains how the Integrated Rescue system intervenes in emergency and crisis situations. A separate part is devoted to the hazardous and strong tornado in Moravia in 2021, where a total of 6 people lost their lives and another 200 were injured, many were hospitalized. Material damage after the tornado's rampage climbed to dizzying heights. The wave of solidarity with the affected population has reached unprecedented proportions not only in the Czech Republic. At the end of the contribution, the authors present their own proposal for the future, how to continue working in this area, from the preparation and convening of a national security conference in the Czech Republic to the preparation and publication of the Model Action Activity of the Integrated Rescue System in the Czech Republic in the disaster event of a tornado.

**KEY WORDS:** *natural disasters, natural disaster prevention, prevention, preparedness, protection, population protection, Integrated rescue system, model action activities, tornado*

### 1. Introduction to the protection of the population in the Czech Republic

The contradictory nature of civilizational activities, associated with the permanent proliferation of security threats and risks, has the effect of increasing the threat to the population from a growing number of types and types of extraordinary events and crisis situations.

However, this objective process is associated with a delay in the development of an adequate security system, which makes the issue of population protection a permanent open issue. Protection of the population as a separate system of specialized measures is an integrated part of crisis management and, in the case of non-military emergencies, a priority issue of crisis management. In the systemic approach to the solution of individual types of extraordinary events, it represents independently controlled and coordinated activity. [1]

Even though the importance of protecting the population, especially with the increasing risks of natural, anthropogenic and mixed origin in peaceful conditions, was fully appreciated in professional circles and accepted by the relevant state authorities and the relevant state authorities through partial measures leading to a gradual change in the situation at the time, the first comprehensive concept of the population adopted by the Czech Republic only in 2002. This concept was set with validity until 2006 and with a view to 2013. [1] Another concept for the protection of the population was adopted in 2008 with validity until 2013 and with a view to 2020. The stated concept also included time schedule for the performance of various tasks and measures. However, at the end of 2013, another concept for the protection of the population was prepared and adopted by the government of the Czech Republic. The

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latest population protection concept was adopted in the Czech Republic in mid-2021 during the difficult time of the Covid-19 pandemic, and a separate part is devoted to this latest concept.

Act No. 239 of June 28, 2000 on the integrated rescue system [2] introduced the concept of population protection into the legal system of the Czech Republic. According to this law, the protection of the population means the fulfillment of the tasks of civil protection, in particular the warning, evacuation, shelter and emergency survival of the population and other measures to ensure the protection of their life, health and property with reference to Article 61 of the Additional Protocol to the Geneva Conventions of 12 August 1949 on protection of victims of international armed conflicts (Protocol I).

The protection of the population has gradually become a priority domain of crisis and emergency planning and management. In connection with its systematic development and practical implementation, it became more obvious that the preparation of a qualified crisis manager requires a comprehensive university education, the focus of which must necessarily be on mastering the concept, theory and practice of population protection.

Protection of the population is a very important area for which the state is largely responsible. The authors of the article are of the opinion that the area of „*population protection*“ requires special attention and systemic support from the state and its institutions. Primarily because its main mission is to protect and save human lives and human health. These are, of course, the most valuable assets that the state has.

The authors of the contribution also believe that the time has come for a thorough analysis and evaluation of the current state of population protection in the Czech Republic with the aim of launching a professional public hearing on the possibility of preparing a law on „*protection of the population of the Czech Republic*“.

At the end of the introductory part, it can be emphasized that the Government of the Czech Republic continuously solves a number of new tasks and measures both in the protection of the population of the Czech Republic and in the area of state safety and security. It should also be emphasized that a total of 22 types of danger have been identified for the Czech Republic, for which a declaration of a state of emergency can be expected. For these cases, it is necessary to take measures leading to the elimination of their risks and develop a new generation of standard plans within the framework of the crisis planning system. [1]

At the meeting of the State Security Council on January 18, 2016, the expert material „*National Security Audit*“ was prepared and discussed, on which over 100 security experts worked. The mentioned complex and extensive professional audit contains a total of 11 chapters, where the responsibility of individual departments for processing is determined. [1] This important audit in the Czech Republic brought many conclusions and recommendations that fundamentally influenced the entire issue of state safety and security and the protection of the population in the Czech Republic. Unfortunately, in the issue of natural disasters, a very rare but extremely dangerous meteorological phenomenon, such as a tornado, has been forgotten.

## **2. Legal regulation of dealing with extraordinary events, crisis situations and protection of the population**

The contemporary world is undergoing significant dynamic changes that are reflected in all areas of our lives, including the security environment. In addition to the phenomenon of terrorism, we are constantly confronted by natural disasters, technological crashes, accidents and other risks that have significant negative consequences, whether it is loss of life, health, property or the environment. Risks and threats are highly variable. They combine with each other. [1]

The development tendencies of contemporary civilization and society in the Czech Republic and the necessity of cooperation with the UN, EU, OSCE, NATO and other international organizations required a response to these tendencies.

Therefore, after long preparations, three fundamental „*security laws*“ were adopted in 2000. Act No. 239/2000 Coll. on an integrated rescue system [2], Act No. 240/2000 Coll. on crisis management [3], Act No. 241/2000 Coll. on economic measures for crisis situations. [4] These laws have already undergone a relatively long development, they are amended because experience shows the necessity of reacting to changes in the development of society, including the protection of the population.

It should be noted that no law will solve everything, it only provides a legal framework for solving problems, in our case for solving reactions to security threats and risks. For each law, a decree must be issued that specifies the implementation of the law. In most cases, laws are supplemented by several implementing decrees. And most importantly - the best law will not solve much if there is no will to fulfill it and if there is no atmosphere in society which respects the laws and which, to put it very generally and simply, has relationships of decency and responsibility.

Both the aforementioned laws and strategies and concepts have been and will be amended and modernized, but their essence cannot change radically. On the one hand, they contain management and communication information that we must respect, and which are a kind of essential guidance for management, and on the other hand, people and authorities are threatened with penalties if they are not properly applied.

To explain and unify the basic definitions and technical terms within the framework of crisis management, population protection, state defence planning and environmental security, it is possible to use a terminological dictionary [5], which is apparently the best tool in the Czech Republic for both professional expression and professional communication.

In addition to the above-mentioned basic laws and the implementing decrees issued for them, it is essential to take into account at least three other important state documents, namely:

1. *Security Strategy of the Czech Republic (2015)*, [6]
2. *Report on the state of population protection in the Czech Republic 2018*, [7]
3. *Concept of population protection until 2025 with a view to 2030 (2021)*. [8]

### 3. A new concept of Population Protection in the Czech Republic

According to the constitutional order of the Czech Republic, the state is obliged to ensure the safety of its citizens in order to lead a quality life. For this purpose, it creates a security system that develops tools to strengthen the protection of the population. The protection of the population is undoubtedly an area that deserves high attention. The valid terminological dictionary of the Ministry of the Interior of the Czech Republic from 2016 defines the protection of the population as follows:

*Fulfillment of civil protection tasks during and outside of armed conflict, especially warning, notification, evacuation, shelter and emergency survival of the population and other measures to secure their life, health and property. The interpretation of the protection of the population is not uniform, in some countries where they do not have a crisis management system, the protection of the population is used in a broader interpretation as a system of non-military protection - it deals, for example, with the protection of internal security and the economy.* [5]

In June 2021, a draft strategic document was approved in the area of population protection in the Czech Republic, which in its content determines the direction and development of population protection in the state until 2030.

„*The concept of population protection until 2025 with a view to 2030*“ was prepared by the Ministry of the Interior - General Directorate of the Fire and Rescue Service of the Czech Republic in accordance with the provisions of § 7, paragraph 2, letter e) Act No. 239/2000 Coll., on the integrated rescue system and on the amendment of certain laws, as amended. [2]

Protection of the population is the fulfillment of civil protection tasks (Article 61 of Additional Protocol I to the Geneva Conventions of August 12, 1949 on the Protection of Victims of International Armed Conflicts), in particular warning, evacuation, shelter and emergency survival of the population and other measures to ensure the protection of its life, health and property. [9]

Given that the Czech Republic does not yet have an independent law on „population protection“, it is significant that since 2002 it has started to issue irregularly, but at certain similar time intervals, the Population Protection Concept, as an important conceptual document, which is intended entirely for the state administration from the top authorities to the individual citizen.

In terms of historical context, it is possible to recall that the first Population Protection Concept was issued in 2002, then in 2008, then in 2013.

The new Population Protection Concept was drafted in 2020 and approved at a meeting of the Government of the Czech Republic in mid-2021 [8], as discussed in more detail below.

*Sample cover of the 2013 publication Concept of Population Protection*

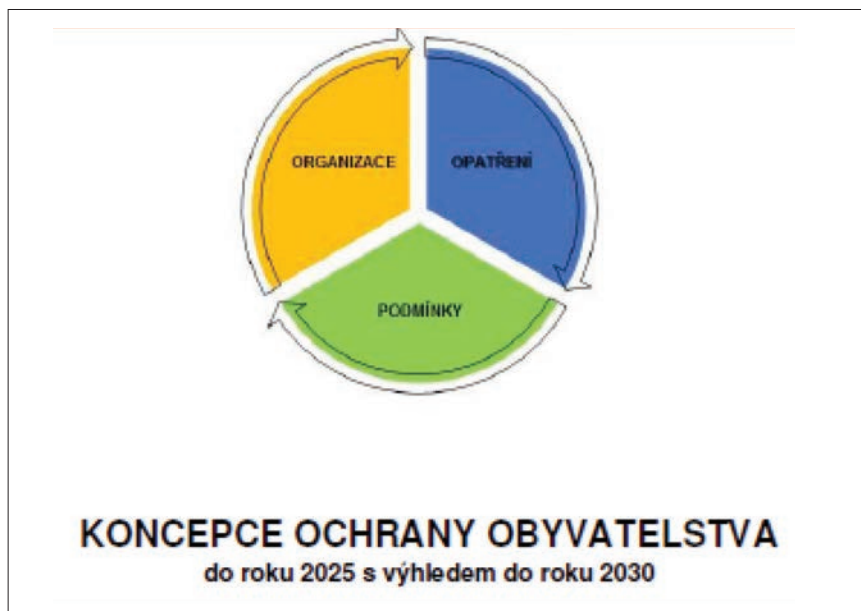
The above-mentioned concepts were always a reflection of the time in which they were created, they were consistently and honestly based on the state of scientific knowledge and established professional tasks and measures for the next period. It is not without interest that the concept of each individual document is somewhat different, both from the point of view of professional content and the page size of individual concepts.



Subsequently, on Monday, June 21, 2021, the government of the Czech Republic approved a fundamental document in the field of population protection - Concept of population protection until 2025 with a view to 2030.

It is therefore not only a significant text from the point of view of the Fire Rescue Service of the Czech Republic, but also from the point of view of ministries and central administrative offices, municipalities and other key actors involved in preparing for and solving large-scale emergencies and crisis situations. [9]

*Sample of part of the cover of the new Population Protection Concept from 2021*



The document sets out 3 basic strategic goals, i.e. the basic lines of further progress. These are divided into 12 task areas.

The protection of the population is viewed from a broader perspective and is understood as a system of prevention, preparedness and response to extraordinary events and crisis situations, the aim of which is the protection of lives, health of persons, property and the environment. Actors are state administration bodies, local governments, legal and entrepreneurial natural persons, but also citizens themselves.

Fulfillment of the **Population Protection Concept by 2025 with a view to 2030** will significantly help increase society's resistance to a wide range of threats. This entire process leads to the required increase in the overall preparedness of not only the population, state administrative bodies, components of the integrated rescue system, i.e. the entire society for possible extraordinary events and crisis situations.

**However, the entire system cannot do without the responsible approach of citizens.** This is a very important and serious idea in the concept, which is intertwined with the entire strategic document.

The concept of the protection of the population is always an important conceptual document on the protection of the population, which responds to the social changes that have taken place on the level of scientific knowledge in security fields. In addition, since 2015, the Czech Republic has issued an evaluation report on the state of population protection in the Czech Republic, every 3 years, the first report was issued in 2015, then in 2018, which are also freely available on the website.

A solid and comprehensive knowledge of this issue is important for a correct understanding and subsequent creative thinking for a permanent increase in the level of protection of the population in the Czech Republic.

*Both in the Czech Republic and in other countries it is true that*

**The ability of every citizen to help himself and others significantly contributes to reducing the negative effects of various extraordinary events and crisis situations. An important and permanent task is to improve the conditions for building sufficient information and good preparedness of the population to ensure the safety of themselves and their loved ones.**

In conclusion, it is possible to refer serious interested parties to a public website, where the mentioned document is not only easily accessible, but also freely downloadable.

The website follows (in Czech):

<https://www.hzscr.cz/clanek/vlada-cr-schvalila-novou-koncepci-ochrany-obyvatelstva.aspx>

#### 4. Model Action Activity of the Integrated Rescue System in the Czech Republic

At the same time, the authors dwell on the fact that there is still no Model Action Activity for Tornado in the Czech Republic. At the same time, it must be emphasized that there are already a total of almost 20 model action activities for individual components of the integrated rescue system.

Model Action Activity includes the procedure of the components of the integrated rescue system during rescue and liquidation work. The exact definition is provided by the aforementioned terminology dictionary [5], which states literally:

*“Recommended methodological standard on the procedure of the components of the Integrated Rescue System during rescue and liquidation work with regard to the type and nature of the emergency, which is followed by binding internal regulations of the individual components of the Integrated Rescue System.”*

It can be stated in more detail that the model action activities of the components of the integrated rescue system during joint intervention are processed according to § 18 of Decree No. 328/2001 Coll. of September 5, 2001 on some details of the security of the integrated rescue system, as amended by Decree No. 429/2003 Coll. The model action activity is issued by the Ministry of the Interior - General Directorate of the Fire Rescue Service of the Czech Republic, Department of the Integrated Rescue System and Service Performance (Department of the Integrated Rescue System).

Overview of Model Action Activities of components of the integrated rescue system during a joint intervention:

- 01 Dirty bomb
- 02 Demonstration of suicidal intent
- 03 Threat of using a booby-trapped explosive system or finding a booby-trapped explosive system, suspicious object, ammunition, explosives and explosive objects
- 04 Intervention of components of the integrated rescue system in the event of an aircraft accident
- 05 Finding of an object with suspected presence of B-agents or toxins
- 06 Measures to ensure public order at gatherings and techno parties
- 07 Rescue of missing persons - search action in the field
- 08 Traffic accident
- 09 Intervention of components of the integrated rescue system in an emergency with a large number of injured persons
- 10 Intervention of components of the integrated rescue system in the event of a dangerous disruption of the flow of traffic on the highway
- 11 Bird flu
- 12 Provision of psychosocial assistance
- 13 Reaction to a chemical attack in the subway
- 14 Amok - active shooter attack
- 15 Irregularities in the operation of railway passenger transport
- 16A Extraordinary event with suspected occurrence of a highly contagious disease in a medical facility or other premises
- 16B Extraordinary event with suspected occurrence of a highly contagious disease on board an aircraft landing at Prague Ruzyně Airport
- 17A Discovery of an illegal drug laboratory

Let us briefly state at least the main characteristics of the Integrated Rescue System in the Czech Republic. It is well known that such systems are built in many countries, but both their composition, as well as the documentation and methods of intervention during natural disasters and crisis situations, are quite different in different countries.

The integrated rescue system is an effective system of links, rules of cooperation and coordination of rescue and security forces, state and local government authorities, natural and legal persons in the joint execution of rescue and liquidation work and preparation for emergencies. So that, in short, “no one is left out who can help and no one of them hinders each other.”

Basic components of the Integrated rescue system in the Czech Republic:

1. Fire Rescue Service of the Czech Republic,
2. Fire protection units included in the area coverage of the region by fire protection units,
3. Emergency medical service providers,
4. Police of the Czech Republic (State Police).

Other components of the Integrated rescue system in the Czech Republic::

5. Dedicated forces and assets of the armed forces,
6. Municipal police,

7. Public health protection authorities,
8. Emergency, emergency, professional and other services,
9. Civil protection equipment,
10. Non-profit organizations and associations of citizens that can be used for rescue and liquidation work.

The Czech Fire Rescue Service is the main coordinator and backbone of the integrated rescue system. In practice, this means, among other things, that if several units of the integrated rescue system intervene, a member of the Czech Fire and Rescue Service is usually in command on the spot, who manages the cooperation of the units and coordinates rescue and liquidation work.

The Operation and Information Center of the integrated rescue system (it is the operation and information center of the Fire Rescue Service of the Czech Republic) summons and deploys the necessary forces and resources of the individual components of the integrated rescue system in specific locations of emergencies. At the strategic level, the integrated rescue system is coordinated by the crisis authorities of the regions and the Ministry of the Interior.

According to the Integrated Rescue System Act [2], the incident commander has extensive powers when carrying out rescue and liquidation work. He can, among other things, prohibit or limit the entry of people to the site of an intervention, order the evacuation of people or set other temporary restrictions to protect life, health, property and the environment, the commander of an intervention is also entitled by law to call on legal entities and natural persons to provide personal or material assistance. Companies and citizens are obliged by law to listen to this request for help in dealing with an emergency.

The rights and obligations of legal entities, natural persons doing business and natural persons during extraordinary events are stipulated in Act No. 239/2000 Coll., on the integrated rescue system, in §23-25. [2]

Why was the integrated rescue system created?

The integrated rescue system is defined by Act No. 239/2000 Coll. [2] However, its foundations were laid already in 1993. The integrated rescue system was created as a need for the daily cooperation of firefighters, paramedics, the police and other agencies in dealing with extraordinary events (fires, accidents, traffic accidents, emergency, natural disasters, etc.). Whenever it was necessary to cooperate in solving a major incident, there was always an interest in cooperating and using whom one cooperates with in order to achieve a quick and efficient rescue or liquidation of the emergency.

## 5. Catastrophic Tornado in Moravia in 2021

On June 24, 2021, in the evening between 7:10 pm and 7:45 pm, South Moravia was hit by a devastating tornado that no one expected. The destruction it brought was vast and overwhelming. Describing the entire catastrophic disaster, or analyzing, evaluating and discussing it, is not a task for this professional contribution, but for a national professional security conference (workshop) of top experts from members of integrated rescue system, erudite scientists and experienced academics, through crisis managers and local governing bodies to research institutions. Many humanitarian organizations from the Czech Republic should also be represented in this professional meeting, which played a significant role in effective assistance to affected municipalities and citizens. [10]

This part presented here is just a mosaic of facts, descriptions, reflections, opinions and topics of the authors mentioned. It is mainly a general description of the given significant extraordinary event that happened in South Moravia in 2021 with the touch of a professional case study. The authors are convinced that a national conference with leading experts should be convened on this issue, as the authors write about it above.

Research is currently underway at the Czech Hydrometeorological Institute (ČHMÚ) with the aim of finding out why only one of the many supercells in the area created a tornado and whether it is possible to obtain information from this experience that will help to make predictions of dangerous phenomena more accurate. This is a relatively rare phenomenon, which may occur more often due to sudden changes in the weather. [10]

Hurricanes are the most destructive storms on Earth. But tornadoes, although only one-hundredth the size of a hurricane and lasting only a very short time, reach even more devastating wind speeds.

In the evening shortly before half past seven pm on June 24, 2021, a devastating tornado hit the area between Břeclav and Hodonín in South Moravia. Its rampage lasted only about 30 minutes, its destructive trail is said to be 26 kilometers long and 100 to 700 meters wide, which were the first estimates. Later, these initial figures were refined according to the summary report to a length of 27.1 km and a width ranging from 250 meters to 2.1 kilometers. Several individual municipalities were affected in this area, but the municipalities of Lužice and Mikulčice in the Hodonín Region, and Moravská Nová Ves and Hrušky in the Břeclav Region are listed as the most affected. [10]

In the first days after the natural disaster, about 2,000 firefighters worked in the affected areas, about 1,000 soldiers and over 500 police officers were also deployed to help people. Almost 600 pieces of special equipment were used. Hundreds of volunteers took part in the rescue and liquidation work, who also significantly helped not only the injured persons. [11]

The worst toll was the loss of six human lives. In addition to the loss of life, the tornado injured approximately 200 people. Several seriously injured persons were transported to the nearest hospitals both in the Czech Republic and even in Austria.

The damage represented, on the one hand, heavily damaged buildings that were destined for demolition (200 out of 1,200). Both family houses and farm buildings were damaged, as well as other local infrastructure, including a large part of the railway line in the Břeclav-Hodonín section, the high-voltage network, and extensive damage was also caused to forest stands and agricultural areas.

Damage to the property of the South Moravian Region reached an approximate value of 800 million Czech crowns, damage to municipal property was 721 million. The total damage after the tornado is estimated at 15 billion Czech crowns.

The described tornado in the south of Moravia struck with force F4, which is the second highest force on the six-level Fujita scale (F0 – F5). A tornado in this category can have wind speeds of 267 to 324 kilometers per hour. With its power, it flattens houses to the ground, or carries away smaller buildings.

Hydrometeorological models predicted the risk of strong thunderstorms, according to meteorologists it was difficult to predict a tornado strike. Radiosonde measurements confirmed the conditions for the formation of very strong thunderstorms.

A warning was also issued for „*very strong thunderstorms that may be locally accompanied by torrential rainfall with totals of around 50 millimeters, wind gusts of around 90 kilometers per hour and hail of larger sizes*“.

In the summary report by the Czech Hydrometeorological Institute [12], we read that „*in view of the physical limitations given by the principle of radar measurements, it is not possible to directly detect a tornado with radar*“ or „*Tornadoes themselves cannot be predicted with a clear determination of place and time, therefore the warnings of the Czech Hydrometeorological Institute targeting strong convective storms that produce dangerous phenomena that the dangerous phenomenon cannot be detected in time.*“

However, according to the Lidové noviny (daily newspaper) report from June 29, 2021 [13], where there was an interview with the Meteoexpress company, interesting and surprising information came to light regarding the refinement of possible forecasts of the occurrence of adverse meteorological phenomena. Tornadoes as a dangerous and destructive phenomenon and similar phenomena are successfully detected and predicted in the USA, but also in neighboring countries, Germany and Poland, for example.

If a tornado occurs, the most important thing is to quickly find an indoor shelter in a building and hide in it. As suitable places in buildings, it is possible to recommend spaces further from windows, where there is no risk of injury to people from glass shards from broken windows. It is also recommended to use the ground or underground areas of buildings to safely hide and protect people. [10]

When outside, you need to huddle near solid structures such as load-bearing walls, or find and use niches to avoid being hit by flying objects.

Many important domestic humanitarian organizations (e.g. Diecévní charita Brno, Adra, People in Need, etc.) provided all-round assistance to the affected citizens, from food and medicine, through in-kind donations to financial assistance. Financial contributions were allocated to affected citizens according to the degree of damage to their homes. Financial contributions were paid in the form of donation contracts. Charity teams also provided psychological assistance to citizens at the site of the natural disaster. [10]

In addition to the deployment of forces and resources of the Czech Republic, material, professional and humanitarian aid was also provided to the affected municipalities and citizens from neighboring countries, including Slovakia, Austria.

Although it may sound cruel, it could be stated that the devastating tornado in Moravia clearly showed people why they should insure a roof over their head in good time. The amount that people pay for good and reliable insurance for their real estate is not staggering. On average, it is something around 3,500 Czech crowns per year. This includes insurance for the building as well as the household and its equipment. The average annual salary at the end of 2021 was approximately 34,360 Czech crowns.

The unexpected and catastrophic tornado in Moravia caused an unusual and huge wave of solidarity not only from the citizens of the Czech Republic, but also from the surrounding countries, including Slovakia, Austria, Germany and Poland. This extensive solidarity with affected citizens can perhaps only be compared to the catastrophic floods in Moravia in 1997 and subsequently in Bohemia in 2002. Almost 1.5 billion Czech crowns were collected in collections for the affected population during the tornado in South Moravia. [10, 12]

## 6. Conclusions and proposals

Our common goal is the protection of the population in the Czech Republic. Quick and effective assistance to the population affected by the consequences of an extraordinary event or crisis situation brings both saved lives and

health, as well as the minimization of property damage, as well as significant financial savings from a society-wide point of view. [7]

Just as the list of threats is expanding and there are new ones that we have not yet considered, the legal environment, personnel capacities, and material and technical security must be changed and developed. It is necessary to prepare residents and subjects of the population protection system, create plans and check their reality. All this, together with the use of possibilities offered by the development of technology, helps to fulfill the tasks of protecting the population. We are convinced that the set tasks are achievable and will help to maintain the direction in which the protection of the population should go in the future. [7]

In conclusion, the authors submit for public expert discussion the following specific proposals for prevention and other security measures to reduce the vulnerability of not only the population, but also their property, critical infrastructure and the environment [10]:

1. From the level of the Government of the Czech Republic, express unequivocal support for the preparedness of the population to handle extraordinary events and crisis situations in the form of short regular live sessions on the Czech State Television and the Czech Radio from the level of both the Prime Minister and individual ministers of the ministries involved, with emphasis on the Minister of the Interior of the Czech Republic.

2. Prepare well-thought-out awareness and then implement it in the area of natural disasters, traffic and industrial accidents using mass information media such as state television, state radio, daily and other press and the Internet.

3. To prepare, convene and organize an expert national security conference, workshop or symposium on „*Prevention, preparedness and protection during a tornado in the Czech Republic*“ for spring/summer 2023.

4. Prepare and exercise to verify a new type of activity of the integrated rescue system called „*Tornado prevention and protection*“.

5. Consider the state audit „*Awareness and preparedness of the population for extraordinary events and crisis situations*“ with the intention of assessing the possibility of preparing a law „*on the protection of the population against extraordinary events and crisis situations*“.

6. Explore and thoroughly map the possibilities of international cooperation with neighboring countries in the field of prevention, preparedness, protection, rescue and liquidation of the aftermath of a tornado. Start effective cooperation in the field of tornado detection with Germany and Poland.

## References

1. **Hradil, J., Mika, O.J., Musil, M., Rak, J., Svodoba, B., Vičar, D.** (2018) Basics of population protection in the Czech Republic [professional university monograph] (in Czech), Tomáš Bata University in Zlín, Faculty of Logistics and Crisis Management in Uherské Hradiště, Uherské Hradiště, ISBN 978-80-7454-774-4.
2. Act No. 239/2000 Coll., on the integrated rescue system as amended.
3. Act No. 240/2000 Coll. on crisis management as amended.
4. Act No. 241/2000 Coll. on economic measures for crisis situations as amended.
5. Collective of authors (2016) Terminological dictionary of terms in the field of crisis management, population protection, environmental security and state defence planning (in Czech), Ministry of the Interior of the Czech Republic, Department of Security Policy and Crime Prevention, Prague, no ISBN or ISSN
6. Collective of authors (2015) Security Strategy of the Czech Republic (in Czech), Ministry of Foreign Affairs of the Czech Republic, Prague, ISBN 978-80-7441-005-5.
7. Collective of authors (2018) Report on the state of population protection in the Czech Republic 2018 (in Czech), Ministry of the Interior of the Czech Republic, General Directorate of the Fire Rescue Service of the Czech Republic, Prague, no ISBN or ISSN
8. Collective of authors (2020) Concept of population protection until 2025 with a view to 2030 (in Czech), Ministry of the Interior of the Czech Republic, General Directorate of the Fire Rescue Service of the Czech Republic, Prague, no ISBN or ISSN
9. **Mika, O. J.** (2022) New concept of population protection in the Czech Republic (in Czech), Civil protection, Revue for civil protection of the population [professional journal], Slovakia, February Issue, pp. 37-38. ISSN 1335-4094.
10. **Mika, O. J., Matys, T.** (2022) Tornado in Moravia, academic reflection a year later (in Czech), Civil protection, Revue for civil protection of the population [professional journal], Slovakia, April Issue, pp. 39-40. ISSN 1335-4094.
11. **Kramář R.** (2021) Firefighters have finished removing the consequences of the tornado in South Moravia (in Czech), Prague, July 22, 2021. [online]. [cited 2022-04-28] Available from <https://www.hzscr.cz/clanek/hasicske-jednotky-ukoncily-odstranovani-nasledku-tornada-na-jizni-morave.aspx>



12. Czech Hydrometeorological Institute, Amateur Meteorological Society, z.s., Amper Meteo s.r.o., Charles University Faculty of Science, Meteopress, limited liability company, Brno University of Technology Aviation Institute, ZAMG and collective (2021) Summary report on the evaluation of the tornado in southern Moravia on June 24, 2021 (in Czech), Prague, Czech Hydrometeorological Institute, October 2021, [online]. [cited 2022-04-28] Available from [https://www.chmi.cz/files/portal/docs/tiskove\\_zpravy/2021/Souhrnna\\_zprava\\_tornado\\_24.6.2021.pdf](https://www.chmi.cz/files/portal/docs/tiskove_zpravy/2021/Souhrnna_zprava_tornado_24.6.2021.pdf)
13. **Najmen M.** (2021) Elsewhere, they can warn of a tornado (in Czech), Lidové noviny (daily newspaper), Prague, June 29, 2021, ISSN 0862-5921 Brno, August 3, 2022