Tasks of the Hungarian Defence Forces in Disaster and Crisis Situation

Communication and information services and capabilities

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***Abstract*—Nowadays, the number of disaster and other crisis situations are growing, and the tasks of the Hungarian Defence Forces are significant. The National Disaster Management is the most important organization, but the Hungarian Defence Forces possess special equipment, and technical devices, so they take part in these situations as the other organizations like Law Enforcement, Hungarian Ambulance Services, and other civilian services. The defence forces have complex communication and information system, which build-up modular elements, so it is easy to use for command and control in these kind of tasks. In this article, the author shows the disaster relief tasks of the Hungarian Defence Forces, and the military communication and information capabilities in these crisis, and disaster situations.**

Keywords—communication and information system; Hungarian Defence Forces; disaster situation; crisis situation; communication and information support

I. INTRODUCTION

The disaster situations give significant tasks for the relevant services, but nowadays other crisis situations appear in Hungary, like the European Migrant Crisis. The basic tasks of the Hungarian Defence Forces (HDF) is to defend Hungary. *"The main tasks of the Hungarian Defence Forces are to defend the independence and territorial integrity of Hungary; contribute to the collective defence and operations of NATO; take part in the international peace support and humanitarian tasks of the international organizations and in industrial, civilizational and natural disaster relief operations"* [1]. The different types of military operations use different sized forces, different technical equipment, but one of the similarity of every type of operations is the information needs, and the possibilities of communication. On Fig. 1 we can see the fundamental type of the military operations [2].

Participation in disaster relief operations is the most important task in this article. The HDF is prepared for participate disaster relief tasks, and for the communication and information support.

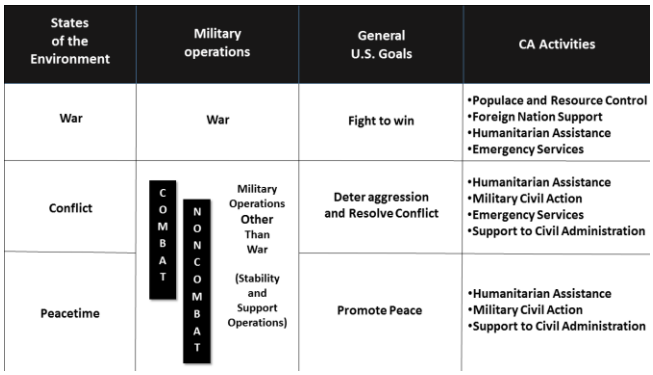

Fig. 1. Military missions, and activities.

In the Fundamental Law of Hungary, the article 45 describes the main tasks and the control of it.

"(2) Unless otherwise provided in an international treaty, and within the framework determined in the Fundamental Law and in a cardinal Act, the National Assembly, the President of the Republic, the National Defence Council, the Government or the Minister vested with the relevant functions and powers shall have the right to direct the Hungarian Defence Forces. The Hungarian Defence Forces shall operate under the direction of the Government.

(3) The Hungarian Defence Forces shall take part in the prevention of disasters, and the relief and elimination of their consequences" [3].

In addition to describe the basic tasks, that also define the responsibilities of the forces at "State of National Crisis", "State of Emergency" and "State of Danger". *"(1) Should the use of the police and the national security services prove insufficient, the Hungarian Defence Forces may be used during a state of emergency"* [4].

Accordance with the tasks of the HDF, it is instrumental in crisis and disaster situation.

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II. Responsibility of the Hungarian Defence Forces in Crisis or Emergency Situation

The basic act of the Hungarian Defence Forces is the "Act CXIII of 2011 on home defence, the Hungarian Defence Forces, and the measures", which is the next elemental document after the Fundamental Law. Reference [5] collected the main documents, that determine the measures and obligations related to disaster management tasks. All intents and purposes the disaster relief of the HDF is well regulated. These documents are the follows:

- The Fundamental Law of Hungary.
- Act CXIII of 2011 on home defence, the Hungarian Defence Forces, and the measures to implement in special legal orders.
- Act CXXVIII of 2011 on disaster management and amending certain related acts.
- Government Decree No. 290/2011 (XII.22.) on the implementation of certain regulations of Act CXIII of 2011 on home defence, the Hungarian Defence Forces, and the measures to implement in special legal orders.
- Government Decree No. 234/2011 (XI.10) on the implementation of Act CXXVIII of 2011 on disaster management and amending certain related acts.
- MoD Decree No. 23/2005 (VI.16.) on the control and tasks of the home-defence sector against disasters; (VI. 16.).
- 28/2012. MoD Regulation (IV. 21.) on the By-laws of the Defence System for Disaster Management; MoD Regulation No. 62/2014. (IX. 26.) on the issue, assurance and use of the By-laws of the Defence System for Disaster Management; MoD Regulation No. 61/2010. (V. 20.).
- 74/2014. MoD ASS–CoDS joint measure of the MoD Administrative State Secretary and the Chief of Defence Staff (HK 10.) on certain regulations of the operation of the Defence-and Administrative Team and the Strategic Operations Command Team -Steering Committee for Disaster Management.
- 285/2014. CoDS measure of the Chief of Defence Staff (HK 11.) on the disaster management tasks of the military organizations of the Defence Staff and the Hungarian Defence Forces.
- 26/2014. CoDS CoOD measure of the Chief of Operations Directive (HK 11.) on the structure, operation and report order of the Atom-, Biological-, Chemical-, Alert and Communication System of the Hungarian Defence Force [5].

The troops of the HDF can take participate in different type of emergency/disaster situations, which has got two main category:

- Natural (flood; earthquake; landslide; fire; thunder/winter).
- Man-made (NBC emergency; terrorism; air crash; building collapse; bomb blast, migration).

Another classification of disaster relief activities is the function or period of activities:

- Period of preparedness-prevention.
- Period of protection.
- Period of recovery.

In the next lines are presented the significant disaster/ emergency situations, where the HDF were appeared and carried out tasks.

The first one is the Slovakian air crash in Hungary. In 19 January, 2006 the aircraft of the Slovak Air Force crashed near Hejce, in northern Hungary, close the Slovak-Hungarian border. The plane was transporting Slovakian soldiers from Kosovo to back home, after serving in peace operation. The plane disappeared from air traffic controller's radar screens when it was catching fire and crashed on Borsó Hill. The aircraft was crashed between the mountains. In this time, it was -15 °C and snow, without roads. It was very difficult to access on the ground, and impossible from the air for the Search and Rescue (SAR) forces. In this situation, the fire department was the leading unit. The HDF cooperated with the other Hungarian and Slovakian troops, and it had got transportation tasks by 4x4 and 6x6 trucks. So the main problem was the terrain, the weather in the disaster relief, and there was no communication possibilities.

The next tasks for the HDF in emergency relief are the flood control activities. The flooding in different places give several tasks for the troops along the rivers. Thousands of HDF soldiers, and hundreds of vehicles serve in this kind of joint protection tasks in the air, on land and water. The biggest flooding from the last years were in 2002, 2006, 2010, and 2014. In this flood preventing operations numerous of soldiers, civilians and other defence forces were participated, that was why the command and control function was very complex and multiple. The hardest part of it was the cooperation communication between the different participants. The soldiers help the civilian society in protection activities, they have transportation function, and lots of other tasks, and they need communication for the coordinated operations.

In 2010, Kolontár and Devecser were flooded by red toxic sludge. The red sludge made huge damage in the towns, and the HDF units had different kind of tasks. The main troops were the HDF 54th "Veszprém" Radar Regiment. This regiment is the closest unit from the villages. They gave all the logistic support. The HDF 93rd "Sándor Petőfi" NBC Battalion was carrying out measurements and personnel, equipment, vehicles and terrain decontaminations. In this measurement tasks, the HDF "Artúr Görgei" NBC Information Center was the main unit. One Mi-17 helicopter arrived from the HDF 86th "Szolnok" Helicopter Base. They made air reconnaissance tasks and different kind of transportation tasks. The HDF 37th "Ferenc Rákóczi II" Engineering Regiment repair the reservoir and made new bridge for the civilians. In this industrial disaster situation, the commanders needed well-coordinated communication system, which command the HDF troops and the other cooperative organizations.

The last one is the migrant crisis and refugee situation, what was predictable [6]. After numberless migrants step over the border, the Hungarian Government came to decision. We have to protect our country, and the EU. That was the reason, that the HDF troops started to made temporary fences, and closed the border. Thousands of Hungarian soldiers and police officers was patrolling through the fences. In this situation not only the executive troops but the staff of the troops were located near by the boards. So the operational level command and control was organized next to the board from CPs (Command Post) and not from the building of HDF Joint Staff Command or from the MoD General Staff. So the "battlefield" communication and information system was the primary system to command. The cooperation was very difficult between the different executives. The participants were the different, like reserve forces, armed forces, civilian organizations, volunteers and police and military officers from allies countries. The soldiers in this operation installed barbed wire (razor-wire) and secure fences at the border, established check points, accomplished patrolling, and other crisis response tasks. First and last, the tasks of the HDF in emergency/disaster relief is complex and diversified, and the practice of the armies are essential. In reference [5] shows the organizational structure of the Defence System for Disaster Management.

III. Communication System and Services

As we saw before, the needs of information are growing as the complexity of the operation. Minimum three types of communication links are needed in these kind of disaster relief activities.

The first one is the command link. The commander of the operation use this link for his command and control activity. This link possess two "types", the first one is the operational one, and the second one is the "controlling" link. The operational link is used by the commander of operational level, who is command on the field. Generally this link is radio communication channel for voice communication or for exchange short data (coordinates, datasheet). The controlling link is for commanders is higher level, ant they are mostly not on the field. This may called "controlling link" for chief of general staff, or Ministry of Defence!

The second one is the cooperating (liaison) communication link. It is use for communication with executives, as the police, ambulance, fire service, disaster management and of course with civilian organizations like water management, meteorology, forestry administration. Regularly it is voice communication links.

The third link is for reach the data even as information from sensors, UAVs (Unmanned Aerial Vehicle), and another devices. That is very important to possess information for the decision making ([7], [8]).

Other communication channels, links are organize and manage depend on the emergency situation such as public information system, public alarm system, but in most cases the disaster management units organize it.

IV. Applied Radios and Services

Before specified links are serviced by different military devices. This chapter present the communication tools, which use in disaster/emergency situation.

The first common military devices are the Combat Net Radios (CNR). In the HDF, the Norwegian Kongsberg MRR (Multi Role Radio) radio family, and the Harris PRC radios are used by land forces, and the air force use some Rohde & Schwarz radios, like Ground Air Ground Radios (GAG).

The Kongsberg MRR radio is an advanced military VHF radio. This software radio have three version, the MV300 (vehicle), the MP300 (manpack) and the MH300 (handheld). The Fig. 2 shows the three types of radios [9]. The radio suitable for fix frequency and frequency hopping services up to 19,2 kbps, between 30.000 MHz and 87.975 MHz frequency range for secure voice and data communication. The output powers are 10 mW, 0.5 W, 5 W and 50 W (MV300).

The AN-PRC 150 (C) multiband tactical radio is an advanced HF/VHF radio, from the Falcon II. Family. This radio provide enhanced secure voice and data link from 1.6 MHz up to 59.999 MHz. The output powers are 1 W, 5 W, 20 W (60 W, 150 W vehicle).

The AN-PRC 117/F multiband and "multimission" radio is a multimode software-defined manpack combat net radio covering 30- 512 MHz frequency range (VHF, UHF, TACSAT). The output power up to 20 W.

These radios are build up to the HDF armored vehicles (BTR-80) and 4x4 vehicles (MB, HUMVEE) and other radio station trucks. The CNR links are very useful for the commanders also in disaster situations, but most of the functions of the radio is not necessary. The only problem with this radios is the efficiency in "multi-organization" activity, because only HDF has CNR radios. These radios are essential in multinational operations and other military operations on the battlefield, but for example in border defence is not so useful.

Fig. 2. Kongsberg MRR radios.

In this situation, the TETRA (Terrestrial Trunked Radio, the ETSI standard for digital trunked radio communications) communication system is one of the best possibility. This radio

system is specially designed for use by government agencies, police forces, fire departments, ambulance, Civil Defence, Hungarian Prison Service, Hungarian Customs and Finance Guard, Disaster Management, public safety networks, and the military. This system offers many advantages like the flexibility, light security, fast call, with last installed base. The communication capability is the flexibility, stability, modularity and lots of others [10]. Nowadays in Hungary this is the only possibility for the cooperation communication between the executives like ambulance, police. For example at the migration crisis situations, the HDF use TETRA system near the border (fences), because that was the only choice for the cooperative communication. (More base stations and some repeaters were installed, and the capacity of the base stations at the border were extended). In Hungary, the TETRA system is advanced communication system, with 300 base stations.

As the TETRA system, the GSM mobile phone system very effective in emergency situation, but this one is not military capability. So the GSM system is only secondary link.

In homeland the satellite communication (VSAT, satellite telephone) not typical communication solution. First of all it is not irretrievable, for example LoS (Line-of-Sight) system, but very expensive, so it could be just secondary system. The HDF not possess digital microwave communication system. So the long range communication link is the Internet with VLANs where no HDF core network. On the field CPs the services for the commander and for his staff is similar like in stationary environment (barracks), so the services are extended. The different information from sensors and meteorology stations are take part of the core communication network services.

The C2 system could be very useful, because the digital map and the tracking system help the commander not only in battlefield, but in crisis situation.

The highest level of the communication organization is the J6 (Defence Staff Signal, Information and Information Protection Directorate). *"Elaborates the requirements for the HDF signal, information and information protection system and the military telecommunication and IT network, participates in the inspections of specialties and issues professional orders for supporting the messaging, information and information protection of disaster management tasks"* [5].

The communication system of the disaster situation is relevant, the HDF can support the operation of prevention, defence and relief activities. Reference [11] determinate the main capabilities of the communication. "From point of view of the appropriate communications systems of disaster recovery the most important characteristics and the vital parameters of them are:

- Availability.
- Performance and throughput of information.
- Robustness and reliability.
- Continuity.
- Up-to-date information inflow.
- Symmetry of down and upstream.
- Communication overload resistance.
- Response time, low jitter, wandering and latency of transmissions.
- Electromagnetic interference (EMI) and noise resistance [10].

V. Conclusion

This article showed the basic theoretical knowledge in emergency situations about the tasks of the HDF, and the applied services. This article is fundamental for experimental researches in this topic. The HDF put over all the crisis and emergency situations in Hungary. All innovates are conducive the tasks of the HDF included the disaster relief. The communication and information system gives adequate services for the members, and it could be apply for the cooperative communication between the executives. The communication system suitably serve the operations, but the future Communication and Information System support may the integrated communication and information system, like the TETRA system, but with wider services.

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