

CBRN CONSEQUENCE MANAGEMENT: NEW APPROACH AND POSSIBILITIES OF PARTICIPATION OF CHEMICAL UNITS

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Abstract

Managing the consequences after using weapons of mass destruction is considered a classic task of the Chemical Corps units and formations. Restoring essential combat capability of troops and recovering from chemical, biological, radiological, or nuclear event is a primary goal of operations, which are termed “CBRN consequence management”. The paper discusses the current approach to the topic in the North Atlantic Treaty Organization and provides notes from operational experience that can lead to the development of relevant military capabilities. Based on an analysis of theoretical and practical approaches, the authors propose capability areas of modern Chemical Corps units that support CBRN consequence management operations.

Keywords: consequence management, chemical corps, CBRN defence, weapons of mass destruction

Introduction

The threat of hostile production, proliferation and eventual use of weapons of mass destruction (WMD), misuse of relevant technologies, efforts of state and

non-state actors in the production of chemical, biological, radiological or nuclear (hereinafter „CBRN“) material or the presence of real arsenals of WMD in the inventory of problem countries is an indisputable fact, and a current security reality.

Programmes for producing WMDs are not triggered solely by hostile states, but also non-state actors to intimidate or threaten any opponents. States often seek WMDs to compensate for military inadequacies. Through asymmetric warfare, these lesser capable states are able to pose a greater threat to adversaries with conventional military dominance¹. On the other hand, terrorist organisations and various extremist groups seek CBRN materials to help them enforce their attitudes. A typical case occurred in 1995, when innocent civilians were attacked by sarin in a Tokyo subway system. The handling of the Aum Shinrikyo attacks offers the opportunity for policymakers, emergency response personnel, and other relevant professionals to learn about CBRN consequence management².

WMD usage is accompanied by the emergence of CBRN contamination and is universally known as a CBRN event. In such a case, it is necessary to mitigate and remove the consequences as soon as possible, for both military forces and the civilian population to include critical infrastructure. Referred to as the „recovery pillar“, it is one of the fundamentals of NATO’s current comprehensive approach to defence against WMD and CBRN threats.

Defining „CBRN consequence management“ and its tasks

The North Atlantic Treaty Organisation (hereinafter „NATO“), with its latest approach to defence against WMD, underlines the importance of three pillars of protection against them, namely prevention (Prevent), protection (Protect) and

¹ ACKLEY, Alissa. *Chemical, Biological, Radiological, and Nuclear Consequence Management: Ways to Improve Fixed-Site Decontamination Capability*. Newport : Naval War College, 2007, p. 3.

² PANGLI, Robyn. *Consequence Management in the 1995 Sarin Attacks on the Japanese Subway System*. BCSIA Discussion Paper 2002-4. Cambridge : Harvard University, John F. Kennedy School of Government, 2002, p. 1.

recovery (Recover). Each of them occupies a unique place in the system and can be filled with the commitment of specific capabilities of NATO member states.

The first pillar, called Prevent, expresses „*Capabilities necessary to avoid, prevent, or stop threatened or actual use of WMD or CBRN devices by state and non-state actors*“.³ Preventive steps lead to disabling an enemy to successfully deploy and use WMDs, thus preventing the emergence of a CBRN event. To do this, it is possible to use a range of activities that are initiated by diplomatic and political steps. However, it is also possible to militarily intervene within the rules on use of force (Rules of Engagement, ROE). This includes, for example, preventing smuggling (interdiction operations) of WMD or their components, collecting evidence and attribution of ownership and responsibility for actions. Last but not least, offensive operations against WMD or their carriers, use of air defence systems against ballistic missiles or other preventive actions are also an option.

The second pillar, called Protect, expresses „*Necessary capabilities to protect against the use of WMD and CBRN devices by state and non-state actors. Preparations to respond to imminent or actual WMD or CBRN attack*“.⁴ The second pillar generally focuses on the aspects of protection against CBRN agents. Measures specifically include early detection and identification, warning and reporting, measures to avoid contamination, use of individual and collective protection equipment, as well as decontamination of troops. This can be considered a set of classical CBRN defence tasks.

The third pillar, called Recover, is described as „*Support to civil authorities with consequence management. Efforts to restore essential capability, protect health and safety, and provide emergency relief*“.⁵ This generally means recovering from a CBRN event to include immediate actions to prevent the spread of threats, save lives and enable continuation of operations. Further, it comprises removing the consequences of the incident. These measures lead to reduction or complete elimination of negative effects of CBRN contamination and returns the damaged

3 NATO *Comprehensive Chemical, Biological, Radiological, Nuclear (CBRN) Defence Concept*. MC 0603/1. Brussels : NATO Headquarters, 2014, p. 10.

4 Ibid. 3.

5 Ibid. 3.

system to a working state. In this manner, NATO supports its Civil Emergency Planning (CEP) Action Plan, which is reflected in appropriate guidelines⁶.

The NATO Glossary of Terms and Definitions⁷ defines Consequence Management as: „*Actions to maintain or restore essential services and to lessen the effects of natural or man-made disasters*“. It is obvious that it does not include a more accurate meaning with regards to CBRN contamination.

A narrower definition is offered in Allied Joint Doctrine for CBRN defence, which defines CBRN Consequence Management as „*Measures taken to mitigate the damage, loss, hardship and suffering caused by catastrophes, disasters or hostile actions. It also includes measures to restore essential services, protect public health and safety and provide emergency relief to affected populations*“⁸. To support CBRN consequence management operations with existing means and capabilities, the doctrine emphasises the following areas:

- logistic support and re-supply;
- force protection;
- documentation and reporting requirements;
- decontamination;
- environmental considerations to prevent pollution and restore the area;
- medical issues (personal protection, casualty-handling operations, medical screening);
- liaison with local, regional and host nation officials as required;
- public affairs activities.

Currently, there is no NATO tactical manual which would direct a common and unified way for performing CBRN consequence management tasks leading to the development of member states' narrowly profiled CBRN consequence management capabilities.

⁶ *Guidelines for First Response to a CBRN Incident*. Brusel : NATO Civil Emergency Planning, Operations Division, 2008. 16 s. Accessible from: <<http://www.nato.int/docu/cep/cep-cbrn-response-e.pdf>>.

⁷ AAP-06, Edition 2015. *NATO Glossary of Terms and Definitions*. Covered by STANAG 3680. NATO Standardization Office, 2015.

⁸ AJP-3.8(A). *Allied Joint Doctrine for CBRN Defence*. Covered by STANAG 2451. NATO Standardization Agency, 2012, p. D-1.

When seeking various approaches, it has been found that understanding the purpose and goals of CBRN consequence management in NATO is conceptually common with perception found in various U.S. Army official documents^{9 10 11}: „*The primary goals of CBRN consequence management are to save lives; prevent injury; provide temporary critical life support; protect critical property, infrastructure, and the environment; restore essential operations; contain the event; and preserve national security*”.

The U.S. Army CBRN defence principles of contamination avoidance, protection, and decontamination support these same goals. For example:

- **Saving lives.** Saving lives is the greatest priority during consequence management operations. This includes immediate life saving measures given by first responders, life-sustaining techniques (immediate decontamination), and prophylaxis to ensure long-term casualty care, treatment, and safety.
- **Preventing injury.** Protection-related measures help prevent or mitigate exposure to hazards that cause injury or illness. These measures include setting up a security perimeter and establishing hazard control zones.
- **Providing temporary critical life support.** Response-related measures are conducted to assist civil authorities in the provision of medical services to injured personnel.
- **Protecting critical property, infrastructure, and the environment.** The protection of critical property, infrastructure, and the environment occurs through the rapid application of decontamination efforts, early warning, reporting of incidents, and protection of key personnel. Command decisions to shelter in place or evacuate also support the protection of resources.
- **Restoring essential operations.** Following a CBRN event, a likely consequence is the loss of one or more essential services or operations. The rapid restoration of power, water, communication nodes, and transportation routes accompanied by decontamination efforts are vital to continuing critical command missions.

⁹ *Chemical, Biological, Radiological, and Nuclear Consequence Management*. Publication JP 3-41. Washington : Joint Chiefs of Staff, 2012. 174 p.

¹⁰ *Multiservice Tactics, Techniques and Procedures for Chemical, Biological, Radiological, and Nuclear Consequence Management Operations*. Field manual ATP 3-11.41. Washington : Headquarters, Department of the Army, 2015. 156 p.

¹¹ *Maneuver Enhancement Brigade Operations*. Field manual FM 3-90.31. Washington: Headquarters, Department of the Army, 2009. 204 p.

- **Containing the event.** Controlling access to an incident site and conducting proper decontamination procedures limit the spread of contamination. Establishing hazard control zones (cold, warm, and hot) helps to ensure safe work areas for emergency responders and supporting resources.
- **Preserving national security.** CBRN defence principles contribute to the preservation of national security by protecting critical infrastructure. When military forces are prepared to respond to an incident, it supports the larger strategic goal of preserving national security.

When comparing the above mentioned NATO and U.S. Army approach with experienced consequence management operations (next paragraph), it can be seen that they do not significantly differ and, for both, it is possible to utilise a similar set of CBRN capabilities. However, NATO does not currently offer any detailed systemisation of those capability areas pertaining solely to CBRN Consequence Management and it seems to be a national issue.

Historical experiences of the Chemical Corps and development of CBRN consequence management related capabilities

Looking at the second half of the 20th century, somewhat different perceptions of the problems of CBRN consequence management can be found. Especially during the Cold War era, the emphasis was put on the need called „restoration of combat capability of troops“ soon after the use of WMDs. Mitigation of consequences was seen as a purely military task - carried out by soldiers and for soldiers. Restoration of combat capability included:

- restoration of impaired command system;
- ensuring a required degree of combat capability of units and formations;
- clarification of new combat tasks and activities of units that did not lose combat readiness;
- bringing units and formations from areas of contamination, fires, floods or destroyed areas;

- complementing units and formations with persons, weapons, and other combat equipment, ammunition and fuel;
- maintaining high moral spirit and mental strength of soldiers¹².

Given the current CBRN threats potentially affecting civilians, it is positively counted with military CBRN support to governmental institutions, e.g. Integrated Rescue System. Its primary utilisation would pertain to liquidation of the consequences to civilians. This fundamentally changes the former „only-military“ concept of CBRN consequence management. The rising threat of terrorist attacks and the related need for recovery support during restoration of essential functions has a similar influence on understanding CBRN consequence management.

Lessons from this type of operation gradually emerge after the attacks on September 11, 2001. One of the known examples of consequence management missions is from Iraq. Seeking to inflame territorial tensions and undermine coalition authority, an al Qaeda splinter group drove a vehicle laden with more than 900 kilograms of explosives into Taza and detonated the device in a residential district.¹³ This is a basic mass casualty event without the presence of any CBRN contamination. However, it is already an event deserving conduct of consequence management tasks. It becomes more serious when the enemy intends to employ WMD or CBRN devices.

The Czech Armed Forces and many other NATO armies participated in an international anti-terrorist operation „Enduring Freedom“ sending contingents into the territory of the State of Kuwait (2002-2003)¹⁴. These contingents were integrated into the Combined Joint Task Force - Consequence Management (CJTF-CM). It was designed mainly to eliminate the possible consequences of WMD use. Among participating countries were the Czech Republic, Germany, Romania, Slovakia, Ukraine, and the United States of America. The Czech

¹² DVOŘÁK, Tomáš. *Consequence Management after enemy WMD attack* (in Czech). Text No. 1146. Vyškov : Military College of Ground Forces, 1991, p. 53.

¹³ JENNINGS, Nathan. Responding to MASCAL Terrorism at the Company Level: Lessons in Consequence Management from OIF. *Infantry*, 2014, Vol. 103, Number 2, p. 8-12. ISSN 0019-9532, p. 8.

¹⁴ MAREK, Vladimír. *Trails by Shatt al-Arab: Stories of the Czech chemical unit and medical and Military Police personnel serving in Kuwait and Southern Iraq*. Prague : Ministry of Defence of the Czech Republic – Military Information and Service Agency, 2007. ISBN 978-80-7278-427-1, p. 15.

contribution gradually consisted of the following groupings: reinforced 9th NBC Company; 4th NBC Detachment; 1st NBC Battalion; and 1st Czech-Slovak NBC Battalion.

The highest number of members (total of 469 soldiers) was the 1st Czech-Slovak NBC Battalion. To meet the challenges of the operation, the battalion resources were allocated to the main force, which consisted of 2 company-sized detachments and a standby detachment. The main forces were stationed in Kuwait City in the area of the National Exhibition Centre and the standby detachment was left at the Kuwaiti base of U.S. forces in Camp Doha. One detachment supported the Civil Defence of the State of Kuwait with a readiness to respond within 60 minutes. The second detachment fulfilled tasks designed to eliminate the possible consequences of WMD in the area of responsibility of U.S. CENTCOM, the Republic of Turkey and the State of Israel, with a readiness to respond within 120 minutes. Furthermore, the entire 1st Czech-Slovak NBC Battalion was tasked to provide humanitarian and medical assistance within the approved proposal for its involvement in a set of international measures to stabilise the security situation and to provide humanitarian aid and reconstruction of the Iraqi Republic.

An essential experience from the deployment of CJTF-CM was orientation on new CBRN defence tasks, which exceeded the historical framework and understanding of CBRN consequence management operations. These special tasks can be summarised as follows:

- urban search and rescue (hot zone extraction) in cooperation between NATO deployed forces and a stricken nation's responders;
- management of affected persons, typically triage¹⁵ and registration;
- decontamination of CBRN contaminated individuals and contaminated casualties, including considerations for gender and religious aspects to the extent that is operationally feasible;
- measures to mitigate consequences (removal, containment, etc.);
- support to CBRN forensics by sampling and identification of biological, chemical and radiological agents (SIBCRA);

15 Triage is the process of sorting casualties based on the severity of injuries and assigning priorities of care and evacuation in a situation with limited resources. Source: *Disaster Response Staff Officer's Handbook*. Guide No. 06-08. Fort Leavenworth : Center for Army Lessons Learned, 2010, p. 84.

- CBRN reconnaissance for delimitation of hazardous areas and contamination levels;
- management of consequences after missile intercept or missile engagement.

Required capabilities of the Chemical Corps to support CBRN consequence management operations

Chemical Corps will always be partial, although making a significant contribution to an extensive CBRN consequence management operation. Their unique capabilities can promote the effectiveness of the response. The authors have identified several capability areas which have been summarised in the following overview:



Picture 1. Capability areas pertaining to CBRN consequence management framework

a) Command and Control

Providing command and control (hereinafter „C2“) of the troops in the hazard control zones includes direction, advice, overview and control of units performing the mission. It includes creation and maintenance of the C2 structure, which controls specific actions and is interoperable with participating units.

C2 capabilities must support all pending operations and requirements of higher headquarters to receive reports. The capability of CBRN ReachBack through internal classified and unclassified communications with higher headquarters and with supported headquarters is also included. External CBRN ReachBack connected to experts and specialists of different scientific disciplines is also required. C2 capability must be compatible with other responders and military forces. The area especially includes capabilities to:

- create a C2 structure for an effective response;
- be compatible and interoperable with participating units and first responders;
- provide staff with accurate information to support the decision-making process;
- utilise experience gained from operations in favour of Lessons Learned;
- provide liaison teams and evaluating teams to participating organisations;
- use CBRN ReachBack through classified and unclassified communications;
- provide C2 of tactical units in hazard control zones;
- provide CBRN local models and meteorological data;
- integrate networked detectors to monitor dangerous perimeter.

b) Assessment of CBRN environments

Correct assessment enables future requirements necessary for planning and conducting operations to be predicted. These activities include assessment of threat, preparedness, tactics, methods of detection and analysis, and monitoring the progress.

The task includes assessment and characterisation of the operating area including the integration of data to determine location and source of CBRN contamination. It includes use of the Intelligence, Surveillance and Reconnaissance (ISR) assets to determine the location of the incident and to perform detection, identification and quantification. The area especially includes capabilities to:

- assess and characterise CBRN threats in the operating area;
- specify potential WMD/CBRN impact on operations;
- cooperate and share tactical situational awareness;
- disseminate information in near real time;
- predict hazards and model CBRN situation;
- control meteorological data in relation to CBRN situation.

c) Crisis planning

Through crisis planning, plans and procedures for establishing necessary capabilities to conduct consequence management operations are developed. It integrates affiliated forces (both military and non-military) and defines their roles and responsibilities. It specifies tasks of subordinate units and includes creating contingency plans for dealing with unforeseen circumstances. The area especially includes capabilities to:

- apply crisis planning procedures on tactical level;
- integrate planners from different departments and branches;
- plan CBRN reconnaissance and survey operations;
- plan decontamination operations;
- plan search, rescue and extraction of contaminated (affected) persons;
- plan provision of temporary shelters, to include handover and evacuation of affected persons.

d) Crisis communication

It is the ability to manage and maintain communication solutions for any incident or identified or expected threat. It includes creation of a common system of alerts and warnings to collect and disseminate information about the incident. Such information is intended for the public, joint forces, representatives of the host nation, as well as governmental and non-governmental organisations. In this manner, CBRN related intelligence information concerning real or potential threats is also disseminated. The area especially includes capabilities to:

- build a common system of alerts and warnings;
- ensure the flow of information and reports concerning threats;
- unify the system for transmitting warning signals and formats for the warning and reporting system;
- integrate data in a common operational picture;

- build a common system for CBRN related intelligence reporting;
- automatically warn about the threat on the basis of an integrated network of detectors (NATO Network Enabled Capability framework).

e) Detection, identification and quantification

Implementation of these activities in the context of consequence management operation is more complex and technically demanding than that of conventional CBRN reconnaissance units. Detection, identification and quantification is done in a contaminated environment at the (civilian specified) Immediate Dangerous for Life and Health (IDLH) levels and in confined spaces. It also includes continual monitoring of dose rates and collection of samples. The area especially includes capabilities to:

- detect, identify and quantify chemical hazards in concentrations higher than the IDLH;
- detect, identify and quantify biological hazards;
- detect, identify and quantify radiological hazards;
- conduct sampling of gases, solids and liquids;
- conduct confirmatory identification of collected samples;
- determine boundaries of contamination.

f) Determination of hazard control zones

Delimitation of hazard control zones are measures to contain and control contamination, including marking of hazardous areas and maintaining limited access to and out of the incident site. It also includes enforcement of isolation and quarantine of affected persons. The area especially includes capabilities to:

- determine hazard control zones – Hot Zone, Warm Zone, and Cold Zone;
- contain and control the spread of contamination;
- mark contaminated areas in a unified and agreed manner;
- control access to the hazard perimeter, to include crowd riot control;
- enforce isolation and quarantine.

g) Search, rescue and extraction

Search, rescue and extraction of casualties and victims in hazardous environments includes assistance to persons who are physically or mentally indisposed after an incident, requiring medical treatment or personal care

beyond first aid. It encompasses management and implementation of life saving procedures, evacuation of affected persons to a collection and sorting centre, to decontamination areas and also evacuation for medical treatment. The area especially includes capabilities to:

- build and operate search and extraction control centres;
- locate, extricate and extract casualties and victims from the contaminated area;
- prepare affected persons for transportation using different types of stretchers and transport methods;
- protect affected persons from the effects of contamination during extraction;
- provide necessary life-saving procedures on the way from contaminated area;
- recognise the status of affected persons and prioritise care;
- mark buildings and structures in a standardised way.

h) Handling with contaminants

In this activity, it comes to handling, treatment, storage and transportation of contaminated equipment, materials, samples, remains and waste. It includes a range of activities from collection and labelling, through handling and storage, to disposal in accordance with the superior's intent. It also encompasses collection and handling of personal material of the deceased and medical evacuees. The area especially includes capabilities to:

- manipulate and handle contaminated and infectious materials, samples, residues and wastes;
- contain contaminated and infectious materials, samples, remains and waste;
- store contaminated and infectious materials, samples, remains and waste;
- transport contaminated and infectious materials, samples, remains and waste;
- sample in accordance with correct procedures of handover (Chain of Custody).

i) Decontamination

The area covers all decontamination activities oriented on CBRN consequence management specifics. It involves decontamination of both civilian and military personnel (walking or lying), including victims and relevant equipment and materials. It is to be expected with activities such as removal or disposal of contaminated material, sealing, leaving to weathering, chemical neutralisation,

and other methods of removal of the contaminant. The area especially includes capabilities to:

- determine priorities for decontamination;
- manage building of joint decontamination sites and assembly points for contaminated personnel;
- decontaminate civilian and military personnel and responders, men and women separately;
- decontaminate injured (both ambulatory and non-ambulatory) persons with provision of medical care;
- decontaminate material and equipment, including oversized pieces;
- decontaminate critical infrastructure and hospitals;
- decontaminate operationally significant terrain;
- check efficacy of decontamination before and after the procedure;
- control outlet of contaminated waste and process water.

j) Handling with human remains

These capabilities pertain to operations that require adequate handling with human remains. It includes labelling, handling, decontamination, handover, temporary storage and preparation for transportation of contaminated human remains. It is necessary to follow health safety principles, focus on protection of sources (water, food) and safe closure of human remains. The area especially includes capabilities to:

- collect and safely manipulate contaminated human remains;
- handover, temporary storage and transportation of contaminated human remains;
- decontaminate human remains;
- contain and dispose of process water and waste.

k) Protection against explosives

This area covers protection of troops and population against the effects of explosives. It includes the following recommendations for residence and movement in explosive ordnance environments, marking the location of explosive material and utilising special technical means enhancing protection against explosives. The area especially includes capabilities to:

- operate safely in explosive ordnance environments;
- jam radio frequencies;
- support explosive ordnance reconnaissance (EOR).

l) Logistic support

It is, in summary, providing logistical material to support the protection of civilians. Determination, allocation and provision of resources necessary to protect individuals, critical infrastructure and material are included. The area especially includes capabilities to:

- support availability of individual protective equipment (IPE);
- support availability of means of collective protection (COLPRO);
- support protection of critical infrastructure and material.

The above mentioned activities represent not only a list of capabilities to support CBRN consequence management operations, but also a general guidance for the formulation of training topics. Thus, they have practical significance in terms of training and exercising for typical scenarios. Even though it may cover different types of units and branches, it is important not just to describe, but also to attach these capabilities to appropriate units (modules) and collectively train them.

Conclusion

In light of the contemporary security environment, the topic can be considered relatively complicated and complex. The necessity of further development of capabilities described in the text can be promoted by experience from foreign military missions and also enemy attacks on civilians in the late 20th and early 21st century. It is a general assumption that similar events may occur in the relatively near future.

Planning for response to the emergence of a CBRN event is an important part of current operations. A comprehensive CBRN defence approach counts with conducting CBRN consequence management, which includes response to and recovery from an incident and leads to mitigation of consequences on civilians and military personnel. This requires responding units which are equipped and

trained beyond the typical military standard to protect troops against WMD. They must be adapted for fulfilment of specific tasks of CBRN consequence management.

The article offers a proposal for structuring capabilities needed to support CBRN consequence management operations. This summary may lead to improvement of NATO member states Chemical Corps while maintaining consistency with allied joint doctrine and NATO's comprehensive CBRN defence approach.

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