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Introduction to the Special Issue Section: Innovations for chemical, biological, radiological, nuclear + explosive – CBRNe defence

Paweł Maciejewski[1], Alexander Kravcov[2], Jan Mazal[3]

[1]ppmaciej@yahoo.co.uk

[2]alexandr.kravcov@fsv.cvut.cz

[1,2]Czech Technical University in Prague, Faculty of Civil Engineering, Department of Construction Technology, Thákurova 7, 160 00 Prague, Czech Republic

[1]https://orcid.org/0000-0001-9934-2956

[2]https://orcid.org/0000-0003-1551-4867

[3]jan.mazal@unob.cz

[3]NATO Modelling & Simulation CoE Piazza, R. Villoresi 1 - 00143 Rome, Italy

[3]https://orcid.org/0000-0001-5741-558X

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Hazards of a chemical, biological, radiological, and nuclear type (CBRN), often coupled with explosives, constitute weapons of mass destruction (WMDs). They have long been a cause for concern. Such weapons not only have a destructive impact on people and the environment, the psychological effects are equally devastating (NATO, 2018). They bring stress and shock not only to victims but also to first responders and troops, affecting their performance, functionality and efficiency.

WMDs also attract the interest of terrorists which is a cause of anxiety and needs constant monitoring. Even though there have been international agreements in the field of proliferation and banning their use, it is important to note that work on their development continues (NATO, 2010). The driving force behind them is the anticipated military effects of their use. At the same time, the ability of troops to defend themselves against WMDs is being developed - both at the basic (universal) and specialist level (NATO, 2005, 2011).

The intention of chemical troops in various armies throughout the world is therefore to implement specialist planning and organisational projects that will weaken or neutralise the effects of an enemy that uses (or threatens to use) chemical and biological agents, as well as weapons that contain these agents (NATO/PfP, 2010).

The 21st century started a new chapter in the functioning of humanity, and unfortunately, it is evolving towards asymmetric threats, including the use of WMDs. This situation requires constant review and the updating of doctrinal documents and procedures, as well as the development of innovative tools to combat threats (NATO, 2004, 2014). One of these tools is the EU-SENSE system for detection, identification, and monitoring of chemical hazards in various environments (Gawlik-Kobylińska *et al.*, 2021). This section of the special issue will present selected research works in the area of CBRN+e. It seeks to contribute to the understanding of security and defence issues and raise awareness of threats primarily associated with human activities.

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