

LTC Paweł Maciejewski, PhD eng., Małgorzata Gawlik-Kobylińska, PhD, War Studies University

Jacek Lebieź, PhD eng. Gdańsk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Immersive 3D Visualization Lab

## **Virtual Training to Survive in CBRN Environment**

The aim of the presentation is to analyse different tools used in the CBRN training. The CBRN training typically involves the issues such as recognizing CBRN hazards (biological, chemical, radiological, nuclear), safety and response, decontamination, risk assessment. Several case studies of virtual trainings will be discussed; they will focus on the use of 2D and 3D platforms as well as Virtual Reality (VR) systems integrated with accessories. The examples of e-courses (flat and 3D courses) both in Polish and English, include the topics such as ecological security; specialist for radiological protection inspectors; contamination analysis; CBRN basis, defense specialists against weapons of mass destruction; SI Beam. Also, the planned courses and scenarios for 3D learning environments will be introduced. They will be performed in the Immersive 3D Visualization Lab, which contain the basic device - the complete (i.e. with four walls, the floor, and the ceiling) cubic Big CAVE (Cave Automatic Virtual Environment).

It is emphasized that the CBRN training should be adaptable and flexible to accommodate different emergency management structures within the nations; used by nations to complement and support national CBRN training programs as required; modular and focused on key functions of the immediate or short-term elements of the response - these modules can then be used in various combinations to meet the specific training needs of the nations; dynamic and incorporated into best practice and lessons learned from real incidents. These specific guidance can be realised through the implementation of new technologies in a didactic process. In order to achieve a positive didactic effects, a detailed planning of tasks is requires. Each course participant should be motivated and engaged into a learning process via a specific design of tasks.

The use of new technologies in the chemical troops training provides the opportunity to present specific situations, scenarios of events and the consequences of the decisions. It also allows for "painless" learning on your own (or someone else's) mistakes as well as observing the effects of actions taken by both individuals, commanders and teams. Because of the skeptic opinion that innovative thinking it is perceived as a promise of everything better, wiser, more effective, all new ideas should undergo rigorous assessment. The main goal of implementation of virtual reality tools in the chemical troops training should be optimization of the didactic effect (knowledge, skills, attitudes or personal skills). It will build security in the field of defense against weapons of mass destruction.

In the final remarks, the authors provide a general remark that new technologies bring endless possibilities for teachers and learners who possess IT skills at different levels. They also highlight that education on hazards, threats, dangerous for life chemical substances is vital for a learner at any age. Learning via new technologies is available anytime, anywhere. For future, they recommend interdisciplinary research activities on human performance in virtual learning environment as this "painless learning on mistakes" gathers more and more followers and supporters.

Keywords: CBRN training, Virtual Reality, new technologies in education

1. Immersive 3D Visualisation Lab Webpage, <https://eti.pg.edu.pl/laboratorium-zanurzonej-wizualizacji-przestrzennej/about-lab> [04.08.18].
2. Maciejewski, P. ICT tools in CBRN troops' education and training. *Zeszyty Naukowe/Wyższa Szkoła Oficerska Wojsk Lądowych im. gen. T. Kościuszki*, Vol. 49, Nr 4 (186) 2017, p. 121--137, DOI: 10.5604/01.3001.0010.7223
3. Project on Minimum Standards and Non-Binding Guidelines for First Responders Regarding Planning, Training, Procedure and Equipment for Chemical, Biological, Radiological and Nuclear (CBRN) Incidents. The International CBRN Training Curriculum, NATO Civil Emergency Planning Civil Protection Group, 2013, p. 4, <http://www.nato.int/issues/cep/CBRN-Curriculum-August2013-EN.pdf> [04.08.18].
4. AJP-3.8 Edition A Version 1 - Allied Joint Doctrine for Chemical, Biological, Radiological, and Nuclear Defence.
5. ATP-3.8.1 Volume I - CBRN Defence on Operations.
6. ATP-3.8.1 Volume II – Specialist CBRN Defence Capabilities.
7. ATP-3.8.1 Volume III - CBRN Defence Standards for Education, Training and Evaluation.
8. [chemical environment], The Free Dictionary, <https://www.thefreedictionary.com/chemical+environment> [04.08.18].