INTERNATIONAL CBRNE MASTER COURSES SERIES

COLLANA DI SICUREZZA CHIMICA, BIOLOGICA, RADIOLOGICA E NUCLEARE

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Peace cannot be kept by force; it can only be achieved by understanding.

Albert Einstein

The CBRNe Book Series was born as an initiative of the Directive Board and of the Scientific Committee of "International Master Courses in Protection Against CBRNe events" (www.mastercbrn.com) at the University of Rome Tor Vergata. The evolution and increase in Security and Safety threats at an international level place remarkable focus on the improvement of the emergency systems to deal with crisis, including those connected to ordinary and non–conventional events (Chemical, Biological, Radiological, Nuclear, and explosives). In every industrial Country there are multiple entities with specialized teams in very specific fields, but the complexity of the events requires professionals that not only have specific know-how, but also expertise in the entire relevant areas. Given the global interest in these issues, the Department of Industrial Engineering and the Faculty of Medicine and Surgery of the Tor Vergata University organize the international Master Courses in "Protection against CBRNe events": I Level Master Course in "Protection against CBRNe events" (120 ECTS) and II Level Master Course in "Protection against CBRNe events" (60 ECTS). These courses aim at providing attendees with comprehensive competences in the field of CBRNe Safety and Security, through teaching and training specifically focused on real needs. Both Master Courses are designed according to the spirit of the Bologna Process for Higher Education, the Italian law and educational system. The Master Courses are organized also in cooperation with the following Italian Public Entities:

— Presidenza del Consiglio dei Ministri (Prime Minister's Office);
— Ministero della Difesa (Ministry of Defence);
— Ministero dell'Interno (Ministry of The Interior);
— Istituto Superiore di Sanità (National Health Institute);
— Istituto Nazionale di Geofisica e Vulcanologia (National Institute for Geophysics and Vulcanology);
— ENEA (Italian National Agency for New Technology, Energy and Sustainable Economic Development);

— University Consortia CRATI, MARIS and SCIRE;
— Comitato Parlamentare per l'Innovazione Tecnologica (Parliamentary Committee for Technological Innovation).

And together with the following International Entities:

— OPCW (Organization for the Prohibition of Chemical Weapons)
— NATO Joint Centre Of Excellence (Czech Republic);
— NATO SCHOOL of Oberammergau (Germany);
— HotZone Solutions Group (The Netherlands);
— VVU–026 Sternberk (Czech Republic);
— Seibersdorf Laboratories GmbH (Austria);
— Chernobyl Centre (Ukraine).

All the above–mentioned organizations have signed official cooperation agreements with the University of Rome Tor Vergata in the aim of Master course activities. The Master have also cooperation with OSCE, IAEA, ECDC, KEMEA in the aim of the didactical activities and we are working to formalize this collaboration with a formal cooperation agreement.

Both Master Courses have been officially granted the "NATO selected" status and have been included in the NATO Education and Training Opportunities Catalogue (ETOC) and also they are supported by OPCW.

The purpose of the CBRNe book series is to give a new perspective of the safety and security risks from both a civil and military point of view, touching all the aspects of the risks from the technological to the medical ones, talking about agents and effects, protection, decontamination, training, emergency management, didactic, investigation, communication and policy.

The authors will be experts of the sector coming from civil, military, academic/research and private realities. A special thanks for the realization of this series goes to Prof. Carlo Bellecci for his initial encouragement, continuous support and help.

Nel mese di Agosto 2016 il Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR) ha inserito la collana nella lista di quelle ufficialmente riconosciute con i seguenti riferimenti:

— codice di classificazione: E237557;
— titolo: CBRNE BOOK SERIES.

During the month of August, 2016, the Italian Minister for Instruction, University and Research (MIUR) has officially added this book series in the list of the official publications recognized by the Minister itself with the following references:

— classification code: E237557;
— title: CBRNE BOOK SERIES.

PAOLO NASTO

TO BE OR NOT TO BE "RESILIENT"? THAT IS THE PROBLEM

RESILIENCE APPLIED ON CBRNE THREAT

aracne

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To my family, to the Military School "Nunziatella"

I cannot say that I have found a one-fits-all-solution regarding how to became resilient and, consequently, build resilience, but I confirm the absolute necessity of everyone, each community, organization and country to be CBRNe resilient.

Paolo NASTO, *To be or not to be "resilient"? That is the problem. Resilience applied on CBRNe threat.*

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Introduction

What is CBRNe? Does this threat still exist? Can we forget this risk and feel safe? Unfortunately, we cannot say that CBRNe no longer exists, it remains a terrible threat for humankind and we must be aware of this. In the last years, there have been several attacks employing CBRN agents/substances. In addition, many terrorist groups and non-state actors have the capability and are willing to use CBRNe devices or WMDs, so they threaten the world by posing this hazard: fear is a weapon of mass destruction.

Despite being banned by treaties, disarmament and arms control programs, there are many states that still develop, stockpile CBRN weapons or WMDs and even use them. So, **CBRNe risk is something dramatically presents in our world and lives** which means that we must face this hazard and be prepared to manage incident situations.

CBRNe threat is the combination of chemical, biological and radiological substances/agents and explosive with dispersal devices and weapons, such us WMD (Weapons of Mass Destruction).

Moreover, new technologies and studies allow malicious people and groups to create new weapons and devices combining chemical, biological and radiological substances with explosives (CBRNe threat) creating small devices with high potential effects. Even small devices, with a tiny explosive charge, can disperse hazardous substances (liquid or solid) causing difficult problems to the affected population, particularly in urban areas and crowded places such as buses, metro, stations, squares, etc.

Furthermore, **accidental incidents and releases involving TIMs** (toxic industrial materials that can be chemical, biological or radiological) **pose a serious hazard** with catastrophic consequences for millions of people and the examples are several: Chernobyl, Bhopal, Fukushima, etc.

Consequently, in case of these types of attacks/incidents, the decision makers must consider some aspects that are really difficult to evaluate: hazard areas to be evacuated, timely emergency decisions

(particularly regarding medical countermeasures), communications, agencies and personnel involved, decontamination protocols, etc. **The occurrence of a CBRNe incident**, apart from representing a threat for First Responders (usually Firefighters, medical services, civil protection), **significantly heightens the vulnerability of population, particularly in overcrowded urban areas**. For this reason, the protection against CBRNe threats must be realized through a broad, common, national and international strategy, according to a multidimensional approach, able to guarantee an even more safety of people, environment, infrastructures, animals and plants.

So, **even if it seems that CBRNe threat, according to the international laws, no longer exists, it still represents a serious risk in the current world scenario**: Syria, Iraq, Salisbury and other incidents have shown us that we cannot forget or underestimate this terrible threat. The most important challenge is to be aware of this hazard, be well prepared and trained. Therefore, the question is: **how can we deal with CBRNe threat? Resilience is the answer: the need for a comprehensive approach that embraces military and civilian organizations in a common effort to prevent, protect and recovery from the CBRNe threat**, starting from being CBRNe aware.

So, how can we be aware of CBRNe threat, what is the very first step when facing this hazard? Basic awareness describes chemical, biological, radiological, nuclear and high-yield explosives agents and how they can harm individuals and infrastructures. It also helps us to act if a CBRNe incident occurs in our workplace, city, country. So, in order to be "CBRNe aware" the responders should be able to identify:

- facts about CBRNe agents, their hazards and risks;
- facts about how CBRNe agents can be used in criminal or terrorist activities and the potential outcome of a weapon of mass destruction (WMD) used by a terrorist;
- indicators, signs, symptoms of exposure to CBRNe agents;
- facts about CBRNe crime scene and evidence preservation;
- how to use self-protection measures in a CBRNe incident;
- the procedures necessary to perform individual chemical and biological (CB) decontamination;
- the steps required to others and safeguard property in a CBRNe incident;
- its role in a CBRNe response plan;