



Book of Abstracts

CSCM

World Congress on CBRNe Science & Consequence Management

Cavtat, Croatia, 14-19 April 2013

International Workshop on Defense and Protection of Cities from CBRN Threats

Cavtat, Croatia, 13-14 April 2013





Welcome

Dear Participants of CSCM Congress,

Allow me to extend to each of you my warmest best wishes, and my personal, as well as official welcome on behalf of the President of the Republic of Croatia, Prof. dr. sc. Ivo Josipović, CSCM Congress International Organizing Committee, College of Applied Sciences in Safety, Zagreb, Croatia, Textile Technology Faculty, University of Zagreb, Croatia, OSDIFE, Observatory on Security and CBRNe Defence, Roma, Italy, Ministry of Interior, Ministry of Defense, National Rescue and Protection Directorate, Ministry of Foreign and European Affairs, and Ministry of Science, Education and Sport. We are very pleased that we are again able to bring together this group of well known and highly respected professionals for this **"CSCM – World Congress on CBRNE Science & Consequence Management"**, the 20th international meeting of the CBMTS Industry series, tradition of which we continue.

We believe the current world situation in regards to terrorism in general and chemical, biological, nuclear and radiological terrorism in particular, demands we provide our best knowledge and resources to deal with the problems that confront us across this arena. This gathering has been made possible by your direct interest and the interest, and sometimes-substantial financial support of numerous national and international organizations, industries and institutions. Prime examples of this support include that of the OPCW - Organization for Prohibition of Chemical Weapons; DOK-ING, Croatia, Cristanini, Italy, RSDecon & Bracco Diagnostics, USA; Pimco, Poland and Croatian Chamber of Economy; Protekta, Atlas-Scan, Ziegler, IND-EKO, Agrokor, Croatia; and media and event partners: IB Consultancy, IFREACT, OSDIFE, CBNW, and CBRNE-Terrorism Newsletter.

Congress continues good tradition in organization of very interesting pre-congress event on urban security and safety in case of CBRN Mass Casualties Incidents "Workshop on Defense and Protection of Cities from CBRN Threats", which will take place from 13 to 14 April 2013.

Building on the base of the very successful CBMTS-Industry I in 1998, which was the first international science and medicine symposium on the role of toxic industrial chemicals (TICs) and releases of these TICs via acts of war and terrorism, we now seek a more comprehensive understanding of the problems associated with chemical, biological, nuclear and radiological terrorism.

This CSCM platform provides a meeting place to unify specialists from all over the world and to offer them an opportunity to exchange their views on current scientific and medical trends in related field. We believe that this gathering can be used as yet another very meaningful contribution to peace and stability in the world. I hope you will experience a very valuable and memorable meeting here in beautiful Cavtat and Dubrovnik.

Sincerely yours,

**Congress Honorary Director
Adviser to the President of the Republic
of Croatia for the Defence Affairs**

Mr. Zlatko Garešić



CSCM – World Congress on CBRNe Science & Consequence Management

13-19 April 2013

**CSCM World Congress on CBRNe Science & Consequence Management
will be held under the auspices of, the President of the Republic of Croatia,
Prof. Dr. sc. Ivo Josipović**

Workshop will be held under the auspices of the city of Zagreb and Dubrovnik

Congress Organizers

College of Applied Sciences in Safety, Zagreb, Croatia
OSDIFE, Observatory on Security and CBRNe Defence, Roma, Italy
Faculty of Textile Technology, University of Zagreb, Croatia

Ministries of the Government of the Republic of Croatia and Institutions as Supporters to the Congress organization

Special Police of the Ministry of Interior
Ministry of Defense and Croatian Armed Forces
National Protection and Rescue Directorate
Ministry of Science, Education and Sports
City Office of Emergency Management Zagreb
Public Fire Department of the City of Zagreb

Congress Co-organizers

Institute of Criminology, Forensic Research and Court Expertise, the University of Sarajevo,
Bosnia and Herzegovina

Technical Congress Co-organizers

URKA, d.o.o./PerfectMeetings, Zagreb, Croatia

Congress Staff

Zlatko Gareljić,

Adviser to the President of the Republic of Croatia for the Defence Affairs, Congress Honorary Director

Zvonko Orehovec

Congress Executive Director

Jeffrey Allen

Congress Co-Director

Stef Stienstra

Congress Co-Director

Boris Mesarić

Congress Co-Director

Sandra Bischof

Congress Co-Director

Slavko Bokan

Congress Chair

Roberto Mugavero

Congress Co-Chair

Peter Leitner

Congress Co-Chair

Peter Lejeune

Congress Co-Chair

CSCM Congress Committees

International Organizing Committee

Zvonko Orehovec, Croatia

Drago Lovrić, Croatia

Vlado Dominić, Croatia

Jadran Perinić, Croatia

Jeffrey Allen, USA

Peter Leitner, USA

Mason Soule, USA

Roberto Mugavero, Italy

Antun Matija Filipović, Croatia

Nandway Chitumbo, Austria

Zvonko Dragčević, Croatia

Marc Cadisch, Switzerland

Davorin Kacian, Croatia

Daniel Kaszeta, UK

Boris Mesarić, Croatia

Gordan Pešić, Croatia

Gordana Modrušan Horvat, Croatia

Alenko Ribić, Croatia

Sanja Bujas Juraga, Croatia

Giuliano Franceschi, Italy

Božica Marković, Croatia

Brankica Grd, Croatia

International Scientific Committee

Slavko Bokan, Croatia

Stef Stienstra, The Netherlands

Nedžad Korajlić, Bosnia and Herzegovina

Sandra Bischof, Croatia

Romeo Tomassetti, NATO

Edita Vujasinović, Croatia

Ioannis Galatas, Greece

Scott Sinkular, USA

Ranko Britvić, Croatia

Barbara Price, USA

Peter Lejeune, USA

Kamil Kuca, Czech Republic

Alessandra Rossodivita, Italy

Ahmet Korkmaz, Turkey

Francesco Foti, Italy

Ed van Zalen, The Netherlands

Antonio Fasanella, Italy

Encho Savov, Bulgaria

Anna Zhvania, Georgia

Elena Ryabchikova, Russian Federation

Henri Derschum, Germany

SECTOR I: Chemical

CHAIR: Kamil Kuca, Czech Republic

CO-CHAIR: Daniel Jun, Czech Republic

SECTOR II: Biological

CHAIR: Stef Stienstra, The Netherlands

CO-CHAIRS: Mason Soule, USA and Anna Zhvania, Georgia

SECTOR III: Existing and Future Civil-Military Systems Interlocking to Address the New CBRNe Challenges: A Comprehensive, Integrated and Multidimensional Approach

CHAIR: Roberto Mugavero, Italy

CO-CHAIR: Col. Romeo Tomassetti, NATO

SECTOR IV: Crisis - Consequence Management

CHAIR: Jeffrey Allen, USA

CO-CHAIRS: Peter Lejeune, USA and Daniel Kaszeta, UK

SECTOR V: Protective Materials, Clothing and Equipment against CBRN Threats

CHAIR: Edita Vujasinović, Croatia

CO-CHAIR: Petar Vitas, Croatia

SECTOR VI: Robotics and Automation Systems

CHAIR: Nandway Chitumbo, Austria

CO-CHAIR: Henri Derschum, Germany



CSCM – World Congress on CBRNe Science & Consequence Management

13-14 April 2013

Workshop Programme

Saturday, 13 April 2013

Hotel Croatia – Hall Bobara

- 09:30-10:00** **Opening of the Workshop with Official Welcome and Introductions**
The Specter of CBRN Incident within the Civilian Populace (95),
Colonel Randy L. Smith, Chief of Staff, NATO JCBRN Defense COE
- 10:00-10:30** **Creating Local Sanctuaries for Sufferers of Chronic Disease**
and the Mitigation of Local Exposure to Contaminants (36),
Dr. Peter Leitner, Higgins Counterterrorism Research Center, USA
- 10:30-11:00** **Doctrine of CBRNe Defense: Civil Defense, Defense Support**
to Civil Authorities (39), *Prof. Roberto Mugavero*,
President of OSDIFE – Observatory on Security and CBRNe Defense, Italy
- 11:00-11:30** **Break**
- 11:30-12:00** **Anthrax Attacks in the USA: Public Health Preparedness, Past, Present,**
and Future (17), *Mr. Anthony Intrepido*, Cubic Applications in support
of the US Army Defense Threat Reduction Agency, Wiesbaden, Germany
- 12:00-12:30** **Integration of Multiple Sensors System, Mathematical Models for**
Evacuation and Chemicals Propagation Model for 24/7 Building
Protection (64), *Piotr Glogowski* and *Bohdan Peterson*, PIMCO, Poland
- 12:30-13:30** **Lunch time**
- 13:30-14:00** **Medical Monitoring of CBRN Mass Casualty Incidents (4), *LTC (ret'd)***
***Dr. Slavko Bokan*,** CSCM Congress Chair, Former expert for NBC Medical
Defense in Croatian Armed Forces and MoD, Croatia
- 14:00-14:45** **Hospitals: The Weak Link in CBRNe Planning (12),**
Brigadier General (ret'd) Ioannis Galatas, MD, MA, MC,
Editor-in-Chief: CBRNE-Terrorism Newsletter, Athens, Greece
- 14:45-15:15** **New EU Regulation on the Marketing and use of Explosives Precursors in**
Function of Protection from Misuse and Illicit Manufacture of Explosives
(82), *Damir Piršič*, Slovenia

- 15:15-15:45** **Synchronizing Emergency Preparedness and Emergency Response in order to ensure successful Disaster Management (68),**
Martin Gegenhuber, MBA* and *Bernd Rott, MSD, LTC,
 EMPAG – Emergency Management and Preparedness Advisory Group, Germany
- 15:45-16:15** **Securing Cities against the Threat of CBRNe Terrorism (65),**
Ilja M. Bensen* and *Elsa Schrier, IB Consultancy, Brussels, Belgium
- 16:15-16:45** **Modern IT Tools and Equipment to increase reliable Information on Chemical Accidents (83),** ***Darko Vinicki, B.Sc.,*** Safety Advisor,
 Petrokemija, Kutina, Croatia
- 16:45-17:30** **Dutch Response to CBRN Incidents, *Sander Banus,***
 National Institute of Public Health and the Environment (RIVM), The Netherlands
- 17:30-18:00** **Discussion**

Sunday, 14 April 2013

Hotel Croatia – Hall Bobara

- 09:00-09:30** **The Public Health Emergency Medical Countermeasure Enterprise (PHEMCE) Approach to End-to-End Medical Countermeasure Policy (32),**
Dr. Elaine Wencil, U.S. Department of Health and Human Services (HHS), USA
- 09:30-10:00** **Fostering Capabilities-Based Approaches that Support a Multi-Functional Response to Public Health Emergencies (19),**
Dr. Marina Kozak, U.S. Department of Health and Human Services (HHS), USA
- 10:00-10:30** **Robotics Systems in Defense against CBRN Threats: UGVs for CBRNE Operations (76),** ***Eng. Giuliano Franceschi,*** R&D Systems Manager,
 Oto Melara – S.p.A., Italy
- 10:30-11:00** **Break**
- 11:00-11:45** **Hotels and Resorts' CBRNE Preparedness (13),**
Brigadier General (ret'd) Ioannis Galatas, MD, MA, MC,
 Editor-in-Chief: CBRNE-Terrorism Newsletter, Athens, Greece
- 11:45-12:15** **European CBRN Risk Assessment Methodology (66),** ***Elsa Schrier,***
 IB Consultancy, Brussels, Belgium
- 12:15-12:45** **Proposal for a Classification of the Animal Anthrax Outbreaks based on the Source of Infection and the Risk for Human (11),**
Dr. Antonio Fasanella, Istituto Zooprofilattico Sperimentale of Puglia and Basilicata, Anthrax Reference Institute of Italy, Italy
- 12:45-13:05** **DOK-ING Robotics Exhibition in front of Hotel Croatia**
- 13:05-13:30** **Conclusions and Closure**



CSCM – World Congress on CBRNe Science & Consequence Management

14-19 April 2013

Congress Programme

Saturday, 13 April 2013

- 10:00-12:00** Congress Registration and pick-up conference materials
- 13:30-16:00** Congress Registration and pick-up conference materials

Sunday, 14 April 2013

- 16:30-17:00** Congress Registration and pick-up conference materials
- 17:00-19:30** **Meeting of Sector/Session Chairs/Co-Chairs**
Hotel Croatia – Hall Bobara, Cavtat
- 19:30-21:30** **Congress Welcome Reception with CSCM Sponsor – Association of
Wine Producers of the Croatian Chamber of Economy**
Hotel Croatia – Hall Bobara, Cavtat

Sectors and Sessions

Monday, 15 April 2013

SECTOR I: CHEMICAL

Sessions: 6, 10
Chair: Kamil Kuca, Czech Republic
Co-Chair: Daniel Jun, Czech Republic

SECTOR II: BIOLOGICAL

Sessions: 5, 7, 12
Chair: Stef Stienstra, The Netherlands
Co-Chairs: Mason Soule, USA
Anna Zhvania, Georgia

SECTOR III: EXISTING AND FUTURE CIVIL-MILITARY SYSTEMS INTERLOCKING TO ADDRESS THE NEW CBRNE CHALLENGES: A COMPREHENSIVE, INTEGRATED AND MULTIDIMENSIONAL APPROACH

Sessions: 8, 11
Chair: Roberto Mugavero, Italy
Co-Chair: Romeo Tomassetti, NATO JCBRN Centre of Excellence

SECTOR IV: CRISIS – CONSEQUENCE MANAGEMENT

Sessions: 3, 4
Chair: Peter Lejeune, USA
Co-Chairs: Daniel Kaszeta, UK
Jeffrey Allen, USA

SECTOR V: PROTECTIVE MATERIALS, CLOTHING AND EQUIPMENT AGAINST CBRN THREATS

Sessions: 9
Chair: Edita Vujasinović, Croatia
Co-Chair: Petar Vitas, Croatia

SECTOR VI: ROBOTICS AND AUTOMATION SYSTEMS

Sessions: 1, 2
Chair: Nandway Chitumbo, Austria
Co-Chair: Henri Derschum, Germany

Monday, 15 April 2013

09:00-12:00 **Hotel Croatia – Congress Hall Ragusa**
Congress Opening with Official Welcome and Introductions

Introduction and Official Welcome by

CSCM Executive Director

Prof.dr.sc. Zvonko Orehovec

Opening Remarks by

CSCM Honorary Director and Adviser to the President of the Republic of Croatia for the Defense Affairs

Zlatko Gareljčić

Remarks by

Director of National Protection and Rescue Directorate

Dr.sc. Jadran Perinić

Remarks by

The Director general of Police

Vlado Dominić

Remarks by

Chief of General Staff of Croatian Armed Forces

Lieutenant General Drago Lovrić

Official Welcome and Congress Opening by

President of the Republic of Croatia

Prof.dr.sc. Ivo Josipović

Keynote Address: Keynote Speakers

Dr. Katie Smallwood,

Department of Epidemic and Pandemic Alert Response, World Health Organization, Geneva

Col. US Army Randy Lee Smith,

Chief of Staff NATO Joint Chemical, Biological, Radiological and Nuclear – JCBRN Centre of Excellence

Mr. Michael Thornton,

European Union Joint Research Centre – JRC – European Commission

Gen. Pietro Finocchio,

International Armed Forces Communications and Electronics Association – AFCEA,
Regional Vice President – Mediterranean Region

Dr. Domenico Giani,

Head of Directorate of Security and Head of Gendarmerie of Vatican State

Dr. Francesco Miorin,

UNICRI Regional Coordinator for the CBRN Centers of Excellence (CoE)
Regional Secretariat for South East Europe, Southern Caucasus, Moldova and Ukraine

12:00-12:30 **Coffee Break**

Monday, 15 April 2013

12:30-13:00 Introductions of CSCM Congress Sectors

Chair: Slavko Bokan, Croatia

Co-Chairs: Peter Leitner, USA

Roberto Mugavero, Italy

Peter Lejeune, USA

Sector Chairs will introduce their Sector and Sessions Chairs and Co-Chairs each approximately 5-10 minutes in duration.

Sector 1: Chemical

Sector 2: Biological

Sector 3: Existing and Future Civil-Military Systems Interlocking to address the new CBRNe Challenges: A Comprehensive, Integrated and Multidimensional Approach

Sector 4: Crisis - Consequence Management

Sector 5: Protective Materials, Clothing and Equipment against CBRN Threats

Sector 6: Robotics and Automation in Defense against CBRN Threats

13:00-14:00 Lunch

14:00-16:00 Robotics and Automation Systems

Session 1:

Robotics and Automation in the Energy Sector

Chair: Nandway Chitumbo, Austria

Co-Chair: Giuliano Franceschi, Italy

1. Robotics Systems in Defense against CBRN Threats: UGVs for CBRNE Operations (76), *Eng. Giuliano Franceschi*, Italy
2. Current R&D Robotics Projects focused on the Energy Sector (69), *Nandway Chitumbo*, Austria
3. Use of Robotics Specifically in the Nuclear Energy Sector (72), *Rob Buckingham*
4. Use of Robotics Specifically in the Oil & Gas Sector (73), *Trond Michael Andersen*
5. Use of Robotics in relation to Fukushima Decommissioning (70), *Nandway Chitumbo*, Austria
6. Defense Threat Reduction Agency Robotics and Automation Initiatives (92), *Scott Sinkular*, USA

16:00-16:30 Coffee Break

16:30-19:00

Session 2:

Robotics and Automation in Military, Police and Industry Security

Chair: Henri Derschum, Germany

Co-Chair: Konstantin Darmaniyan, Croatia

1. Multifunctional Robotic System for CBRNE Application (69), *Konstantin Darmaniyan* and *Darko Dužanec*, Croatia
2. Robotics Application in Military, Police and Civil Defense (75), *Konstantin P. Darmaniyan*, Croatia
3. Multi-Functional Solutions for CBRN Decontamination in the Contemporary Operating Environment (21), *Marc Jacoby*, Italy
4. High Security Access Control (67), *Saša Petar*, Croatia
5. Adapting Decontamination Capabilities to Changing Scenarios: From Cold War to Foreign Deployment and Homeland Security (7), *Henri Derschum*, Germany
6. Modern IT Tools and Equipment to increase reliable Information on Chemical Accidents (84), *Darko Vinicki*, Croatia

19:00 Free time

Tuesday, 16 April 2013

08:30-09:00 **Consequence Management Day**
Introduction and Keynote Speech, *MG Jeff W. Mathis III*,
Joint Task Force Civil Support Commander, USA

**CBRN Consequence Management
and military support to first responders**

09:00-09:30

**Session 3:
Consequence Management**

Chair: Peter Lejeune, USA
Co-Chair: Jeffrey Allen, USA

1. Foreign Consequence Management (94), Chuck Lee, DTRA, USA

09:00-09:30 **Coffee Break**

09:30-12:00

**Smuggling, Counter Proliferation, Borders Security,
and Consequence Management Panel Discussion**

Chair: Dan Kaszeta, UK
Co-Chair: Jeffrey Allen, USA

- 1. Counter Proliferation (81), *Peter Lejeune*, President, International Institute for Non-Proliferation Studies, USA**
- 2. Wide Area Radiation Surveillance with Semiconductor Detectors (34), *Ulrich Parzefall*, Germany, *Marco Forin*, Italy, *Elena Turco*, Spain**
- 3. Combined Effort Enhances Success (30), *Scott Sinkular*, USA**
- 4. New EU Regulation on the Marketing and use of Explosives Precursors in Function of Protection from Misuse and Illicit Manufacture of Explosives (82), *Damir Piršić*, Slovenia**
- 5. Did CBRN-Related "Problems Identified" in the last three Olympics become "Lessons Learned"? (14), *Brigadier General (ret'd) Ioannis Galatas, MD, MA, MC*, Editor-in-Chief: CBRNE-Terrorism Newsletter, Athens, Greece**

12:00-13:00 **Lunch**

13:00-14:30

**Session 4:
Crisis Communications and CBR Incident Management**

Chair: Anthony Intrepido, USA
Co-Chair: Ioannis Galatas, Greece

- 1. Initial Assessment of CBRN/HAZMAT Incidents: The First Hour (85), *Dan Kaszeta*, UK**
- 2. Enhancing Resilience to Large-Scale Biological Threats (16), *Anthony Intrepido*, USA**
- 3. Fostering Capabilities-Based Approaches that Support a Multi-Functional Response to Public Health Emergencies (19), *Marina Kozak*, USA**
- 4. The Public Health Emergency Medical Countermeasure Enterprise (PHEMCE) Approach to End-to-End Medical Countermeasure Policy (32), *Elaine Wencil*, USA**
- 5. Initial Assessment of CBRN/HAZMAT Incidents: The First Hour (84), *Daniel Kaszeta*, Senior Research Fellow, International Institute for Non-Proliferation Studies, London, UK**

14:30 **Transport to Tito's Retreat (Kupari)**

15:00-16:00

**Demonstration and Exercise – Commentary by
LTC Jeffrey Allen, USA and Dan Kaszeta, UK**

Exercise Scenario

- Intelligence has been received that a criminal gang will attempt to smuggle unknown chemical, and possible radiological materials across the border
- Security and detection forces are deployed
- Two vehicles matching the general description for the one being used approach the border:
 - The vehicles are stopped and scanned
 - One appears positive for radiological materials
 - One appears has suspicious containers
- The Croatian Antiterrorist unit of Special Police Respond

Exercise participants:

- Antiterrorist unit of Special Police, Croatian Ministry of Interior
- State Directorate for Protection and Rescue (Civil Protection, Fire Brigade)
- DOK-ING – robotic mine clearance and firefighting systems, Croatia

16:30-17:00 Transport to Hotel Croatia

19:00-21:30

Congress Dinner – Hotel Croatia terrace

Wednesday 17 April 2013

08:30-10:30

Session 5: Biological 1

Biosafety and Biosecurity in the South Caucasus

Chair: **Mason Soule**, Georgia

Co-Chair: **Mehmet Doganay**, Turkey

1. **The Path Forward for Georgia's Laboratory Network (63)**, **Mason Soule**, Georgia
2. **The Biosafety and Biosecurity Experience of Turkey (8)**, **Mehmet Doganay**, Turkey
3. **Biosafety and Biosecurity Framework in Armenia (27)**, **Ruzanna Harutyunyan**, Armenia
4. **Biosafety at the Richard G. Lugar Center for Public Health Research (CPHR)**,
Tbilisi, Georgia (41), **Eka Khabazi**, Georgia
5. **Biosafety Program For Human & Veterinary Laboratories In Georgia (15)**,
Tea Glonti, Georgia
6. **Eliava Institute Experience in Biosafety/Biosecurity and New Perspectives
in Implementation of International Standards and Regulations (93)**,
Mzia Kutateladze, Georgia

10:30-11:00 **Coffee Break**

09:30-12:00

Session 6: Chemical 1

Chair: **Kamil Kuca**, Czech Republic

Co-Chair: **Marc Cadisch**, Switzerland

1. **Centrally and Peripherally Active Ache Inhibitors - Prophylaxis Against
Nerve Agents (20)**, **Kamil Kuca**, Czech Republic
2. **Improving Forensic Capabilities (57)**, **Marc Cadisch**, Switzerland
3. **Industrial Chemicals as a Threat in unstable Environments (62)**,
Stef Stienstra, The Netherlands
4. **Complex Processing of Suspicious Finds with Unknown Content:
Dangerous Compounds Identification and Elimination (9)**, **Tomas Dropa**, Czech Republic
5. **Novel Mechanisms in the Pathogenesis of Late Mustard Toxicity (44)**,
Ahmet Korkmaz, Turkey
6. **Autonomic Monitoring of Metro Stations for Hazardous Substances (56)**,
Thomas Elssner, Bruker Daltonik GmbH, Leipzig, Germany

13:00-14:00 **Lunch**

14:00-16:00

Session 7: Biological 2

Chair: **Stef Stienstra**, The Netherlands

Co-Chair: **Peter Leitner**, USA

1. **The Use of Anthrax and Orthopox Therapeutic Antibodies from
Human Origin in Biodefense (61)**, **Stef Stienstra**, The Netherlands
2. **Commercial Trade in Active Pharmaceutical Ingredients (API's):
Security Risks Posed by Bioregulators (37)**, **Peter Leitner**, USA
3. **Antimicrobial Activity of Pentacyclic Triterpenes Isolated from Acacia Genus (49)**,
Joyce Ondicho, Kenya
4. **Electronic Solutions for Implementing, Tracking and Auditing HSE Programs (22)**,
Patricia Olinger, USA
5. **An Update on the Phage Technology (87)**, **David Trudil**, USA

16:00-16:30 **Coffee Break**

16:30-18:30

Session 8:

**Existing and Future Civil-Military Systems Interlocking to address
the New CBRNe Challenges: A Comprehensive, Integrated and
Multidimensional Approach 1**

Chair: Roberto Mugavero, Italy

Co-Chair: Romeo Tomassetti, NATO JCBRN Centre of Excellence

- 1. MAG International (80), *Adm. Giovanni Galatolo***, Italy
- 2. Current Scenarios and Trend in Natural, Accidental and CBRNe Events:
Evolving Support of future Strategies for the New Dimension of Territorial
Threats (38), *Roberto Mugavero***, Italy
- 3. Frontiers of short and Mid-Term Civil-Military Cooperation in CBRN Defense (90),
*Romeo Tomassetti***, NATO JCBRN Centre of Excellence
- 4. Disasters and CBRNe Events: An Application Of Civilian And Military Cooperation,
The Italian project of ANA- Alpini Field Hospital and EI ACISMOM to cope with the
increasing risk for CBRNE and disasters (26), *Alessandra Rossodivita***, Italy
- 5. Heavy Metals in the Aquatic Environment: Fish and their Parasites as Sentinel
Organisms for Pollution (91), *Franz Jirsa***, Austria
- 6. Research on the Safety Engineering Students' Perception of the Influence
of Cyber Terrorism in the Field of Integral Safety (96), *Antun Matija Filipović***, Croatia

18:30

Free Time

Thursday 18 April 2013

08:30-10:30

Session 9: Protective Materials, Clothing And Equipment Against CBRN Threats

Chair: **Edita Vujasinović**, Croatia

Co-Chair: **Petar Vitas**, Croatia

1. Degree of Impermeability of Military Protective Fabrics to Hazard Substances (58), *Andrea Katović*, Croatia
2. Morphometric Methods in the Determination of Human Shape Variability for the Construction of Protective Clothing (60), *Jacqueline Domjanić*, Croatia
3. Protective Clothing Recyclability (77), *Edita Vujasinović*, Croatia
4. Nano-Functionalization of Textiles: Protection and Health Safety (78), *Sandra Bischof*, Croatia
5. New Approaches for Protective Firefighters' Clothing – CB Protection (79), *Hursa Anica*, *Zvonko Dragčević* and *Zvonko Orehovec*, Croatia
6. IF REACT (86), *Ana Mikačić*, *Ranko Britvić* and *Petar Vitas*, Croatia

10:30-11:00 Coffee Break

11:00-12:40

Session 10: Chemical 2

Chair: **Daniel Jun**, Czech Republic

Co-Chair: **Shahriar Khateri**, Iran

1. In Vitro Oxime-Assisted Reactivation of Human Butyrylcholinesterase - Development of Potential Prophylaxis for Nerve Agent Intoxications (55), *Daniel Jun*, Czech Republic
2. Data Fusion Application in the Context of Integrated Data Analysis of Chemical Warfare Agents and their Degradation Products (1), *Asish Mohapatra*, Canada
3. Acetylcholinesterase Reactivators and Surfactants with a Promising Application Potential (83), *Martin Kunes*, Czech Republic
4. From Okunoshima Island to Majnoon Island (Chronic-Low Dose VS Single-High Dose Exposure to Sulfur Mustard, A Comparative Clinical Evaluation) (52), *Shahriar Khateri*, Iran

13:00-14:00 Lunch

14:00-16:00

Session 11: Existing and Future Civil-Military Systems Interlocking to address the New CBRN Challenges: A Comprehensive, Integrated and Multidimensional Approach 2

Chair: **Alessandra Rossodivita**, Italy

Co-Chair: **Yu Shuang-Ping**, China

1. The National Stockpile System of Emergency Medical Items in China: The Way Ahead (33), *Yu Shuang-Ping*, China
2. The CBRN Pre-Hospital Response in Lombardy: Evolution and Sustainability (40), *Francesco Foti*, Italy
3. Impact Profiling of Chemical, Biological, Nuclear and Radiological Incidents (54), *Simona Cavallini*, Italy
4. Capacities of Bosnia and Herzegovina in the Fight Against CBRN Terrorism (88), *Nebojsa Bojanic* and *Nedžad Korajlic*, Bosnia and Herzegovina
5. CBRN Terrorism and Bosnia and Herzegovina (89), *Goran Kovacevic* and *Haris Halilovic*, Bosnia and Herzegovina

16:00-16:30 Coffee Break

16:30 - 18:30

**Session 12:
Biological 3**

Chair: Sander Banus, The Netherlands

Co-Chair: Heinz Ellerbrok, Germany

1. **Benefits from a National Bio-Security Research Program (10),** *Heinz Ellerbrok*, Germany
2. **Comprehensive Approach to Analyze Powder Samples for Presence of Biological Toxins (25),** *Christopher Pöhlmann*, Germany
3. **Dutch Biosecurity Toolkit to Enhance Self Regulation (28),** *Sander Banus*, The Netherlands
4. **Potential Environmental Risks of Nanophotocatalysts Applications and their Prevention,** *Rashid Khaydarov*, Uzbekistan
5. **Safe Clinical Applications of the Biological Half-Time Decorporation of Uranium based on Preclinical Investigations (51),** *Constantin Stan*, Romania
6. **Experience in Treatment of Contaminated Soil using Thermal Desorption Technology (59),** *Miroslav Emling*, Croatia

18:30

Free Time

Friday 19 April 2013

09:00-10:30

**Session 13:
The Summary of Sessions by Sector Chairs/Co-Chairs**

Chair: Slavko Bokan, Croatia

Co-Chairs: Peter Leitner, USA

Roberto Mugavero, Italy

Peter Lejeune, USA

As a norm, each Sector Report will be approximately 10 minutes in duration.

Sector 1: Chemical

Sector 2: Biological

Sector 3: Existing and Future Civil-Military Systems Interlocking to address the new CBRNe Challenges: A Comprehensive, Integrated and Multidimensional Approach

Sector 4: Crisis - Consequence Management

Sector 5: Protective Materials, Clothing and Equipment against CBRN Threats

Sector 6: Robotics and Automation in Defense against CBRN Threats

10:30-11:00 The CSCM Meetings: The best way forward
Closing Remarks and the Congress Adjourns

12:00-13:00 Lunch

13:00 Free time Afternoon

Saturday 20 April 2013

05:00 Transfers to Dubrovnik Airport

NOTE:

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CSCM Congress and Workshop Abstracts

1. DATA FUSION APPLICATION IN THE CONTEXT OF INTEGRATED DATA ANALYSIS OF CHEMICAL WARFARE AGENTS AND THEIR DEGRADATION PRODUCTS

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MSc, MPhil (pre-doctoral), EMC

Risk Cert (Harvard)

Title: Regional Health Risk Assessment and Toxicology Specialist

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Disclaimer: Information in this abstract does not represent the views of Health Canada. It has been shared solely for this workshop/meeting discussion and is subject to further analysis, validation and correction, if required. Information presented here (in part) extracted from a contractor project report on Data Fusion Application in the context of Human Health Risk Assessment of Contaminated Sites. This is not Health Canada's official guidance.

Based on my earlier work on data fusion applications in the context of human health risk analysis of toxic industrial chemicals (TIC) such as petroleum hydrocarbon mixtures, we are extending application of our Data Fusion (DF) based Human Health Risk Assessment (HHRA) framework and DF techniques to Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) risk assessments, and toxicological evaluations of Chemical Warfare Agents (CWAs) and degradation products which are emerging issues for environmental health agencies worldwide. Based on advancements in science and technology, predictive and computational toxicology and from the perspective of potential terrorism events, accidents, military and non-military use and dispersal of CWAs in air, soil, and water are some of the topics which are at the forefront of critical research and analysis among public health, clinical health, military, and emergency management professionals. Analysis of spatial and temporal exposure scenarios to such complex mixtures as well as their degradation products is very important. Furthermore, integrated toxicological and exposure data analysis can be challenging for such health risk assessments and effective risk management. In order to have a better handle on such heterogeneous chemical and biological mixture datasets, public health toxicologists, risk assessors and clinical health practitioners need to integrate exposure and toxicity data, and predictive modelling data from multiple models under an established data fusion framework.

Our modified DF-HHRA JDL (Joint Director Laboratory) framework was based on multiple model data fusion (MMDF) based algorithms which have the capability of being responsive to dynamic changes in the environment and address data conflicts effectively. By adopting our MMDF framework, health risk management decision making can be effective (if required, in real time) by fusing heterogeneous and complex datasets from CWAs exposure and toxicology. In addition to advanced statistical tools and techniques (heterogeneous Dynamic Bayesian network), we also explored semantic web technologies application in the context of HHRA of CBRNE issues. CBRNE related databases such as Wireless Information System for Emergency Responders (WISER), Radiation Emergency Medical Management (REMM), and Chemical Hazards Emergency Medical Management (CHEMM) from National Library of Medicine (NLM), National Institute of Health (NIH) were reviewed for potential applications. My focus is on risk assessment and management and contaminated sites remediation and potential applications of emerging system biology information related to chemicals. I will provide some information pertaining to sulfur mustard and a nerve gas example (e.g., VX).

Key Words/Phrases: Data Fusion, Mixtures, Predictive Toxicology, Computational Toxicology, Human Health Risk Assessment, Risk Management, CBRNe, MMDF, WISER, REMM, CHEMM



Asish Mohapatra MSc, Mphil, EMC, Risk Cert., Regional Health Risk Assessment and Toxicology Specialist – Contaminated Sites, Environmental Health Program Regions and Programs Branch, Health Canada. Asish Mohapatra is a Health Risk Assessment and Toxicology Specialist working for Health Canada (Prairies Region) Contaminated Sites group. He has 15 years of experience in the

public and private sectors in the areas of life sciences, environmental public health sciences, chemical, biological and computational toxicology, human health risk assessment and management and remediation. Specifically, in the areas of chemical, biological and radiological toxicology and health risk assessments, he has worked as a expert reviewer of contaminated sites health risk assessment projects including issues pertaining to indoor and outdoor environmental quality. He has conducted uncertainty analysis, quantitative risk assessment modelling, and toxicological evaluations of chemical and biological and radiological stressors. He has been evaluating existing and emerging predictive tools and advanced computational technologies (e.g., semantic web technologies and data fusion tools) to effectively use them to analyze, disseminate, and share toxicological and health risk assessment data of complex chemical clusters from disparate sources under public health toxicology and risk assessment frameworks. Recent works included technical reference book publications in the areas of toxicology, toxicoinformatics and global chemical management and collaborative work with several global agencies and multi-stakeholder groups and initiatives in the area of dose response techniques, predictive toxicology applications and system biology database and knowledge integration.

2. CHEMICAL WEAPONS DESTRUCTION – PUBLIC OUTREACH EXPERIENCE IN RUSSIA

Mr. Sergei Baranovsky

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Green Cross International (GCI) is involved in Chemical Weapons destruction from the beginning of that process in Russian Federation (RF).

At the first stage (1994-1997) Green Cross Russia (GCR) initiated the discussion in the State Duma, which finally made possible the ratification of the Chemical weapons convention (CWC) by state of Russia. To help in the process of CWC implementation, GCR with the support of OPCW, CTR, Global partnership, introduced an unique Public Outreach System for RF. It include the network of public information centers in all regions of chemical weapons stockpiles (6 subjects of RF, 7 stockpiles, 12 centers). We organized first Public Hearings in the country history (1995) in Saratov, and then in other subjects of RF (1996-2001). Important part of the Public outreach system became a National Forum-Dialogues. First started in 1997, just after the CWC ratification by RF. In the presentation would be shown an examples of the other public outreach activity (social-medical projects, risk assessment, environmental education for public, emergency preparedness seminars at setera...).



Sergei Baranovsky has been President of Green Cross Russia since 1999, and has also supervised his organization's "Environmental education for sustainable development" program. Sergei was born 15 June, 1943 in Moscow. In 1960 he entered the Moscow Aviation Institute (MAI) at the Faculty "Engines of aircraft." After graduating in 1966, he taught at the institute and also defended

his candidate's and doctoral thesis, being awarded the title of professor of the theory of air-breathing engines. He was the invited professor at several universities in the United States, Germany, France and China. In 1989, he was presented the Council of Ministers Award for his innovative theoretical work related to combustion chambers. Sergei is a leading scholar in the field of ecology, an academic of the Russian Ecological Academy of the Russian Academy of Natural Sciences, and author of numerous articles, monographs and articles on various aspects of environmental problems. In 1990 he was invited to serve in the post of Deputy Director-General of the first USSR State consortium, "Ecoprom" dealing with scientific work, and was the developer of the State program "Ekotekhprom 90". From 1992-94, he worked with the Gorbachev Foundation as a leading expert on ecology and was the executive secretary of the working group for creating Green Cross International. In 1998, he was the editor of the monograph "Radiation legacy of the Cold War", which analyzes and presents data on radioactive contamination of the territories and waters of Russia, caused by the testing of nuclear weapons. Sergei also helped develop the latest curricula for environmental education in Russia.

3. NEW EMERGING SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS AND THE THREATS RELEVANT TO THE BIOLOGICAL WEAPONS CONVENTION

Dr. Slavko Bokan, LTC (Ret)

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HR-10000 Zagreb
Croatia

New scientific and technological developments include the broad number of fields and scientific areas: bioinformatics, systems biology, synthetic biology, advanced bioreactors, transgenic plants, insects and animals, aerosols and aerobiology, nanotechnology, neuroscience, biosensors, vaccines, diagnostics, and epidemiology. Advances in pharmaceutical technology, targeted drug-delivery techniques such as aerosols and viral vectors have also made substantial progress and can also be used to spread biological agents. Synthetic biology in biotechnology research and applications may inadvertently give rise to new, highly hazardous man-made pathogens with unpredictable consequences. Recent major advances in genomics, such as next generation sequencing technology, have provided large numbers of genome sequences, from microbes through to plants, animals and humans. Improvements in synthesis technology are accelerating innovation across many areas of research, but misuse of DNA-synthesis technology could give rise to both known and unforeseeable threats to our biological safety and security. Besides, antibiotic resistance has become a major clinical and public health problem and human infections from antibiotic-resistant bacteria have increased dramatically. Multi-drug resistant (MDR) bacteria are one of the principal weapons in the bioterrorists' arsenal and of great interest for biological warfare. Biotechnology which can be used to create biological weapons will be one of the gravest threats we will face. Dual use of synthetic biology represents a potential opportunity for designing of harmful engineered pathogens. Synthetic biology falls in the scope of BWC and needs a special attention in the future.

This presentation has aim to improve scientific discussion about new emerging sciences and technologies and the threats they may pose to the Biological Weapons Convention (BWC). Synthetic biotechnology poses a huge latent threat, as it could be used in the future to create pathogens of even greater toxicity and infectiousness than those currently known, and which are resistant to traditional vaccines and drugs. Scientific community has a key role in helping to reduce the risks of misuse of new scientific and technological developments.

Key Words/Phrases: New Sciences and Technologies, Biological Threat, Bioterrorism, BWC

4. MEDICAL MONITORING OF CBRN MASS CASUALTY EVENTS (Workshop)

Dr. Slavko Bokan, LTC (Ret)

Brune Busica 13
HR-10000 Zagreb
Croatia

An incident where number of casualties overwhelms responder's resources and hospital capacity and capability is Mass Casualties Incident. Cites security and safety in case of CBRN threats represent for local and states for local and state government and community huge problems. A medical disaster occurs when the destructive effects of natural or manmade forces overwhelm a community's ability to properly allocate existing resources. For most hospital staffs and Public Health Authorities, consequence and medical management of CBRN Mass Casualties presents an obscure and even frightening situation. Unique principles of triage, agent detection and decontamination in an CBRN Mass Casualty Incident (MCI). Responding to CBRN terrorism involves making very difficult decisions with limited information and may need to deal with thousands of persons in need of decontamination and exposure assessment. Psychological and social impacts of CBRN emergencies may be acute in the short-term can also cause long-term and severe psychosocial consequences that may often be greater than the physical consequences of the event.

Rapid detection of CBRN agents and weapons, and rapid diagnosis of their effects on people are crucial activities. In this presentation will be used risk assessment of probability of CBRN weapons use and potential impact resulting from their terrorist use. Also, medical countermeasure preparedness for CBRN threats will be presented such as evacuation as a key measure, PPE, decontamination in real time prevents further exposure and ongoing absorption with further intoxication, and other important medical treatment procedures.

Key Words/Phrases: Mass Casualties Incident, CBRN terrorism, medical disaster, medical countermeasures



Dr. Slavko Bokan is former expert and advisor in NBC Medical Defense of Croatian Armed Forces-CAF and MOD. His major research experiences were in the field of toxicology, medical treatment, protection, detection, identification and decontamination against nuclear, radiological, chemical, biological, and toxin weapons and also in occupational health and industrial toxicology. He was

Chairman of the South Eastern Europe Defense Ministerial (SEDM) Working Group on Defense/Military Support to Counter-proliferation, Border Security and Counter-terrorism (CBSC). Last fourteen years Dr. Bokan was official expert member of Croatian Delegation during negotiations into Ad-hoc Group and in the intersectional process of states parties Biological Weapons Convention (BWC) in Geneva. He has assisted the OPCW in many efforts in Croatia such as the first OPCW exercise on assistance, ASSISTEX-I that was held 2002

in Zadar, Croatia. He helped to establish and serves as a Chair of the well known CBMTS-Industry series of scientific meetings with authentic title World Congress on Chemical, Biological and Radiological Terrorism which are held each two years in Croatia.

5. DECONSTRUCTING THE FEAR OF RESPONDING TO A DIRTY BOMB

Christopher John Cowen

Proxima Technologies
United States Capitol Police Hazardous Materials Specialist
Department of Energy Radiological Technician
Glenville
PA 17329
USA

Is the fear that the world's governments and general population feel when it comes to the potential of a dirty bomb attack rational? When you mention the potential for a radiological incident people becomes fearful. Would modern society collapse as some fear? Is the reality that we will face like what we see in the movies?

Within this discussion we will talk about the various types of traditional and Improvised Explosive Devices (IED's) we have faced in the field and how a dirty bomb incident would complicate things. We will look at the potential for a terrorist to create a dirty bomb. We will also look at once a dirty bomb attack has been executed how we as emergency responders would deal this type of incident. Who within the United States can we call for help? How long will an incident of this caliber take to control and mitigate? After this presentation the audience will have an understanding of the realities of a potential dirty bomb attack and dispel the Hollywood myths of one.

Key Words/Phrases: Hazards, Dirty Bomb, IED, radiological incident

6. TERRIORMISM ATTACKS THROUGH THE MAIL: BIOLOGICAL TERRORISM – RICIN

Christopher John Cowen

Proxima Technologies
United States Capitol Police Hazardous Materials Specialist
Department of Energy Radiological Technician
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Within this presentation we will identify and discuss the public health terminology used in reference to the Biological Toxin, Ricin. We will discuss the background of Ricin and how it is made and dispersed. We will then take an in-depth look at the Ricin Mail Attacks that occurred between October 2003 and February 2004. We then will look at how the Ricin Mail Attacks differed from the 2001 Anthrax Mail attacks that occurred on Capitol Hill within the United States. What

lessons were learned from these incidents? What were the other factors that occurred around the time of the incidents that could have affected how the hazardous materials teams responded and mitigated the incidents? We will then look at proper sampling techniques when it comes to handling Ricin.

Key Words/ Phrases: Ricin, Biological incident, Sampling Techniques, Hazardous Materials Response



Christopher John Cowen is a Hazardous Materials Specialist with the United States Capitol Police. He is a member of the Hazardous Materials Response Team (HMRT). His unit handles all Nuclear, Biological, & Chemical (NBC) incidents that occur within the United States Capitol Hill complex. Mr. Cowen is a Certified Radiation Safety Officer (RSO) through the Radiation Safety Academy. He is

regarded as a Subject Matter Expert (SME) in the area of radiation. He is a Certified Radiological Technician through the Department of Energy (DOE) and a Certified Radiation Specialist through the US Capitol Police. In February of 2004, the Dirksen Senate Office Building on Capitol Hill was infected with a letter by a biological toxin named Ricin. Chris was a member of the Hazardous Material team that responded and mitigated the incident. He was responsible for the decontaminating the scene, provide security, as well as collecting and processing evidence. Mr. Cowen has helped coordinate emergency planning for multijurisdictional events that required working closely with other domestic and international law enforcement agencies, these events included The President's State of the Union Address and multiple United States Presidential Inaugurations. Chris has a Bachelor of Arts from the Richard Stockton College and a Master's of Science degree in Criminal Justice from the University of Wisconsin.

7. ADAPTING DECONTAMINATION CAPABILITIES TO CHANGING SCENARIOS: FROM COLD WAR TO FOREIGN DEPLOYMENT AND HOMELAND SECURITY

Henri Derschum

OWR GmbH
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Germany

NBC: Evolved from heavy and ironclad to light and flexible.

For a long period within the last thirty years, NBC Doctrine and correlating research and development efforts were focused on maintaining an operational readiness for military forces. Beginning in 2001, new situations evolved along changing security and military doctrine, besides conventional and direct action, unconventional (i.e. irregular), indirect and "dirty" use of weapons of mass destruction had to be considered. In succession, military and more and more civilian authorities became involved in upgrading and rearming their defensive CBRN arsenal. Capabilities once thought of as unnecessary were put into the spotlight, such as civilian casualties' decontamination or the decontamination of large civilian structures to the point of being able to reinhabit them.

With ongoing diversification, those equally important tasks were imposed on the classical NBC unit with its former main task of decontamination of highly trained individuals and hardened military hardware. Today this only reflects a fraction of the potential work load of a modern NBC unit. Improved equipment has to cover additional capabilities, thus, redesign and refurbishment of material already fielded has become another challenge, with governments spending less money for new equipment.

Key Words/Phrases: NBC units, refurbishment, future perspective, modernization



Henri Derschum – after his graduation in Biology at the University of Constance Henri Derschum was reenlisted as a commanding officer and assigned to the newly founded Medical B-Reconnaissance and Verification Unit of the German Army Institute of Microbiology as scientific staff officer. After ending his military career as an OF-3 in 2009, he joined reserve forces and currently

represents the head of department for NBC-defence, OHS and environmental protection of the Bundeswehr 1st Armored Division in Oldenburg in submission. During his ten years of military service he became specialized in microbiology and vector biology, as well as an expert for BW-defense related issues, with emphasis on CBR/NBC defense equipment information and evaluations. His international work experience spans scientific and military missions in Mongolia, Afghanistan, U.A.E. and numerous European countries.

8. THE BIOSAFETY AND BIOSECURITY EXPERIENCE OF TURKEY

Dr. Mehmet Doganay

Department of Infectious Diseases
Faculty of Medicine, Erciyes University
Kayseri
Turkey

Biosafety and biosecurity are not only medical issue; it is also political, governmental, social and public issues. Perceptions for biosafety and biosecurity have changed after the deliberate release of anthrax by the postal system in the USA in 2001 and some experienced pandemic diseases in both world and Turkey; SARS, Avian influenza (H5N1), Swine influenza (H1N1) in the last decade and HIV infection which still going pandemic. Turkey is located in more strategic area in the Middle East connecting Asia to Europe and North Africa. There are many wars and fighting around Turkey and leading to uncontrolled animals and human movement from nearby countries. These are potentially carrying some new disease risks. This also cause to break or difficulties in delivery of health services. For the reason of experienced pandemic diseases in the last decade, Turkish Ministry of Health revised some legislation on medical service system, reorganized reference laboratories, and improved the waste medical material collection, infectious biological material transportation. On the other, written and visual media have increased to

awareness of people living in Turkey about new risky diseases and potential deliberate diseases.

Some microorganisms considering potential bioterrorism agents such as *Brucella* spp., *Francisella tularensis*, *Bacillus anthracis* and Crimean-Congo hemorrhagic fever virus have lead to an endemic or epidemic disease in some part of Turkey. The most important issue is to apply a strict infection control measurements and education program in endemic areas and a counter measurement should be prepared against the agents for potential deliberate diseases in Turkey.

Key Words/Phrases: Biosafety, Biosecurity, Biological Threats, Risks, Turkey



Dr. Mehmet Doganay was graduated from Medical School at 1975 and became a specialist in infectious disease at 1979. I organized and set up two infectious diseases clinics; at Cumhuriyet University, Sivas and Erciyes University, Kayseri in Turkey. I was appointed as a Professor in 1993. I have interested in anthrax, brucellosis and other zoonotic diseases, potential bioterrorism

agents, sepsis and communicable infectious diseases which were endemic disease in this region and also HIV infection. I actively joined to work on the preparation of WHO Anthrax Guidelines in 1998 and 2008. I also organized the Turkish Society of Hospital Infection and Control in 2000 and worked as president between 2000 and 2004. Currently, I am also a member of Zoonoses Working Group of International Society of Chemotherapy. Until today, 184 hundred scientific papers writing in Turkish and English were released and of which, about 72 appeared in the journals indexing by pubmed or SCI / SCI-expanded.

9. COMPLEX PROCESSING OF SUSPICIOUS FINDS WITH UNKNOWN CONTENT: DANGEROUS COMPOUNDS IDENTIFICATION AND ELIMINATION

Tomas Dropa, M.Sc.
Martin Urban, M.Sc.
Marketa Weisheitelova, M.Sc.
National Institute for NBC Protection
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Czech Republic

A special system and methodology for safe processing of unspecified, suspicious finds of steel/solid stuffs with unknown content (e.g. pressurised steel bottles, abandoned chemical ammunition etc.) have been developed and optimized in the National Institute for NBC Protection.

The present system enables opening of such finds and content sampling and identification inside its basic part, a special pressure-resistant reactor. Operations in the reactor are carried out by means of remote-controlled devices and supporting components (shifting bed, drilling head, monitoring system). Chemical compound released into reactor from the opened find is sampled and analysed by gas

chromatography-mass spectrometry technique (GC-MS). On the basis of the identification step, an appropriate method for content elimination is finally performed. Present system and methodology are suitable for all kinds of (potentially) dangerous finds, including highly toxic chemical /biological materials and CWAs.

Key Words/Phrases: CWA; Chemical Ammunition; Gas Chromatography-Mass Spectrometry



Tomas Dropa, M.Sc., Head of Laboratory of Toxic Compounds, National Institute for NBC Protection, Czech Republic. Since 1994 he worked in Hygiene Institute, first as a specialist, later as a head of the Laboratory of Special Organic Analyses; in 1999 he was appointed a head of Chemistry Department. In 2001 Tomas Dropa joined National Institute for NBC Protection

(SUJCHBO). As a senior researcher he is focused on applied research, testing and evaluation of protective equipment, sampling and processing of highly toxic chemical compounds, including chemical warfare agents (CWA), their detection and ways of decontamination. He is determined a chief of SUJCHBO mobile laboratory for on-site operations under action of Integrated Rescue System (IRS) of the Czech Republic and for OPCW request under Article X of the Chemical Weapons Convention. He is also member of the Czech Team dedicated on request for international humanitarian/rescue operations. He is involved in several R&D projects covering chemical countermeasure issues and has rich experience with GC-MS and LC-MS analyses, measurements and mass spectra interpretation. Besides he is a SUJCHBO lecturer for training educational courses organized under request for IRS and for OPCW state parties. Tomas Dropa is a principal co/investigator in several projects and author and co/author of number of research reports and articles.

10. BENEFITS FROM A NATIONAL BIOSECURITY RESEARCH PROGRAM

Dr. Heinz Ellerbrok
Robert Koch-Institute
Nordufer 20
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Germany

In recent years biosecurity has become a major global concern. To protect populations from bioterrorist threats and to warrant optimal security for society countries have invested in infrastructure and institutions as well as in technologies. However, these efforts usually remain on a national level and exchange of technologies and reagents across borders is uncommon. One of the pre-requisites to warrant optimal biosecurity for modern society is rapid and sensitive detection of biothreat agents using lab-based as well as mobile analytical approaches. Supported by the security research program of the German Federal Ministry of Education and Research (BMBF) the national BiGRUDI project (Risk Assessment, Rapid Detection and Identification of Biothreat Agents) was accomplished. In the course of this German network project results were obtained on different levels

comprising 1) knowledge and skills 2) detection reagents, equipment 3) implementation of biothreat detection technologies 4) establishment/enhancement of networks. Generation of knowledge is demonstrated through peer-reviewed publications and a considerable number of diploma, masters, and doctoral theses.

Highly specific and sensitive detection reagents have been developed but implementation in detection platforms was massively hampered by restriction to a national market, which with the exception of the US is usually too limited to allow investments necessary to transfer know-how into prototypes and into commercial products. On the other hand analytical skills have been expanded and networks were established and cooperation in the field of biosecurity was forged and in some cases has been institutionalized.

Key Words/Phrases: Biosecurity, Risk Assessment Rapid Detection and Identification of Biothreat Agents, German security research program



Heinz Ellerbrok studied chemistry and biochemistry at the Free University Berlin. His doctoral thesis was on bacterial cell walls at the Max-Planck-Institute for Molecular Genetics in Berlin. At Institut Cochin de Génétique Moléculaire in Paris he worked for 4.5 years on retroviruses. He joined the Robert Koch Institute in Berlin in 1992. His main focus is on molecular diagnostics and detection methods

for biothreat agents and emerging diseases. At present he is deputy head at the Highly Pathogenic Viruses unit.

11. PROPOSAL FOR A CLASSIFICATION OF THE ANIMAL ANTHRAX OUTBREAKS BASED ON THE SOURCE OF INFECTION AND THE RISK FOR HUMAN

Dr. Antonio Fasanella

Valentina Mercurio

Lorenzo Pace

Luigina Serrecchia

Angela Aceti

Istituto Zooprofilattico Sperimentale of Puglia and Basilicata

Anthrax Reference Institute of Italy

Italy

Anthrax is a non-contagious disease, known since ancient times. However, it became a matter of global public interest after the bioterrorist attacks in the U.S.A. during the autumn of 2001. The concern of politicians and civil authorities everywhere towards this emergency necessitated a significant research effort and the prevention of new bioterrorist acts. Anthrax, however, is primarily a disease that affects livestock and wildlife. This article underlines the importance of paying increasing attention to this zoonosis. In the scientific literature there is no classification of animal anthrax outbreaks and the

analysis of many years of investigation of this disease, the authors have come to identify three types of outbreaks depending on the source of infection: classic anthrax outbreaks, atypical anthrax outbreaks and anthrax epidemic like.

The source of infection of classic anthrax outbreaks is represented by infected pastures. They are sporadic and involve very low number of animals. The source of the atypical outbreaks is represented by contaminated feed; they are considered dangerous because can develop in areas free from anthrax. The atypical phenomenon may lead health workers to misdiagnose and, consequently, an inappropriately manage of affected carcasses with a consequent and inevitable increase of the risk of infection for human. The anthrax epidemic-like is an evolution of the classic sporadic form and depends by the activity of hematophagous insect. It is characterized by several outbreaks that develop in a short period generally during the middle and late summer.

Key Words/Phrases: anthrax, outbreak, risk factor, classification, source



Dr. Antonio Fasanella – Chief of the Department of Anthrax Reference Institute of Italy of the Istituto Zooprofilattico Sperimentale of Puglia and Basilicata (Public Health Institute). Education/Training: 1987 degree in Veterinary Medicine-University of Bari, 1992 PhD in Parasitology and parasite disease – University of Bari, 1998 Post graduate in Parasitology, Parasitic and Infectious disease of animals

near University of Bari, 2000 Stage near Louisiana State University and Northern Arizona University, Professor part time of Infectious disease near Faculty of Veterinary Medicine of Bari, Italy. Recent positions: 2000 named Vice Director of IZSPB, October 2001 Ministry of Health of Italy named him national referent of the test to reveal spores of anthrax in suspect specimens in the bioterrorism emergency Referee for "Vaccine", Expert of Italy in "European Commission" Anthrax wet lab exercise, Expert of Italy for the security activity of G7 and Mexico "ANTHRAX WETLAB WORKSHOP", Expert of Italy in the OECD/RUSSIAN FEDERATION WORKSHOP ON BIOSECURITY OF MICROBIAL BIOLOGICAL RESOURCES – COMPLEMENTING INNOVATION 2006 Moscow, 2006 foreign expert of the project KR-1101 "Assessment of spatial mechanisms of pollution of the territory of Kyrgyzstan by anthrax agent, 2009 foreign expert of the project KR-1101 "Assessment of spatial mechanisms of pollution of the territory of Kyrgyzstan by anthrax agent. II Phase", Expert of Italy in the ONU conference on BWC Geneve 24 – 28 August 2009, Expert of FAO.

12. HOSPITALS: THE WEAK LINK IN CBRNE PLANNING

Brigadier General (ret'd) Ioannis Galatas

MD, MA, MC

Editor-in-Chief: CBRNE-Terrorism Newsletter

Athens

Greece

One of the most important lessons learned following the Tokyo sarin incident was the fact that approximately 80% of the people involved in a real terrorist CBRN attack in urban environment will be directed (by their

own means – 85%) to all hospitals and clinics of a metropolitan city. Usually all CBRNE response plans involve a hospital chapter. Unfortunately all relevant drills stop at the entrance of the hospital most probably assuming that medical personnel is well trained and equipped to deal with mass casualties of this kind. It is a fact that hospitals' CBRNE preparedness represent the weakest link in all plans and this is something that needs to be addresses seriously both at local and international levels. This presentation will analyze hospital preparedness issues, will prove the statement of "weak link", will share problems identified in two Olympic Games eight years apart (Athens 2004 & London 2012) and will propose applicable solutions for now and the future.

Key Words/Phrases: hospitals, preparedness, CBRNE, planning, terrorism

13. HOTELS AND RESORTS' CBRNE PREPAREDNESS

Brigadier General (ret'd) Ioannis Galatas
MD, MA, MC
Editor-in-Chief: CBRNE-Terrorism Newsletter
Athens
Greece

Hotels and resorts were always on the top list of terrorist attacks worldwide. In the last two decades many attacks have been recorded in many countries around the globe resulting in heavy casualties among both tourists and locals. The Taj Mahal Hotel attack during the multiple terrorist attack in Mumbai, India is one of the most prominent examples and still vivid in our minds. Until now only conventional terrorist attacks have been executed. This does not exclude the release of CBR agents with or without explosives usage. Apart from weapons of mass destruction, big hospital units might be exposed to toxic or radio-contaminates plumes following a chemical/nuclear plant accident or man-made deliberate action. Current presentation will address this issue and will provide applicable solutions for hardening the infrastructure and degrading the consequences of CBR agents on travelers and personnel. Given the fact that the unexpected always happens we better be prepared than sorry. An attack of this kind will not only cost lives but will push local response infrastructure to its limits; not to mention the national, financial and social disturbance that will cause.

Key Words/Phrases: hotels, preparedness, CBRNE, countermeasures, terrorism

14. DID CBRN-RELATED "PROBLEMS IDENTIFIED" IN THE LAST THREE OLYMPICS BECAME "LESSONS LEARNED"?

Brigadier General (ret'd) Ioannis Galatas
MD, MA, MC
Editor-in-Chief: CBRNE-Terrorism Newsletter
Athens
Greece

2004 Olympic Games in Athens, Greece was the first Summer Olympics after 9/11 and universal anthrax scare. Since then, we enjoyed equally safe Olympics in China (Beijing 2008) and the UK (London 2012). During the 2004 Games many CBRN-related problems were identified in many different sectors of the response chain. Unfortunately most of them were not solved thus becoming lessons learned. The most worrying problem remains the human attitude of high officials towards new emerging threats. Although they do prepare to deal with such threats they do not really believe into their actual existence given the massacre they might produce in real world. This attitude resembles the universal shock following the WTC terrorist hecatomb – an attitude that remains unshaken after the triple Fukushima catastrophe or the more recent space attack in a Russian city! Population training is still out of the game of preparedness while hospitals remain confident that they will deal with mass casualties despite the fact that they lack specialized training, equipment and mode of operation. All experts involved in CBRN preparedness do know that such a threat will never be able to be handled in a complete and effective way. At least let us do our duty and prepare to contain the extent of consequences and minimize the effects on humans and properties the best way we can. Let us be guided by the example of Leonidas and his 300 Spartans that fight to the end although they knew that invader will numerically prevail!

Key Words/Phrases: lessons-learned, Olympics, Athens, Beijing, London, preparedness, CBRN



BG (ret'd) Galatas Ioannis, MD, MA, MC. Retired military physician (Aug 2010) – Brigadier General (MD) with 35 yrs industry experience; MD Consultant in Allergy & Clinical Immunology; Head of Dpt of Allergy/Clin Immunology, Army General Hospital of Athens for more than 20yrs; Medical/Hospital CBRNE Planner – with hands-on 2004 Olympic Games experience; trained in many countries abroad (Iran included); plus 10yrs of experience; Editor-in-Chief: "CBRNE-Terrorism Newsletter" (online e-journal); Senior Asymmetric Threats Analyst – former Head, Department of Asymmetric Threats, Joint Military Intelligence Service, Hellenic National Defense General Staff (last military post); MA in "International Terrorism, Organized Crime & Global Security" (Coventry University, UK – 2010); Senior Fellow at New Westminster College, British Columbia, Canada (as of July 18th, 2012); PhD candidate – Athens' Medical School (Department of Forensics & Toxicology: August 2012 -).

15. BIOSAFETY PROGRAM FOR HUMAN & VETERINARY LABORATORIES IN GEORGIA

Tea Glonti, PhD
Nino Kheladze, MD
Stephen Rohrer, PhD, RBP
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The Republic of Georgia, with support from the US Defense Threat Reduction Agency, has built a network of laboratories for the detection and surveillance of human and animal infectious diseases associated with Especially Dangerous Pathogens (EDP). This requires management of numerous biosafety and biosecurity (BS&S) risks and involves implementing a BS&S program that is based on international standards and best practices. Program implementation was achieved through training, mentoring, risk assessments, and upgrades and improvements to facilities and practices. BS&S training included development of unique methods of instruction since lab personnel exhibited a wide range of skills, experience, and knowledge. An interactive style of training was used that challenged the staff to implement what they learned and showed areas where more training was needed. A mentoring program for biosafety officers and laboratory staff was established that included much on-the-job assistance and the conduct of workshops and symposiums. Facility and operational risk assessments were done using focused BS&S Lab Assessment Checklists and reports. Completion of laboratory upgrades and improvements to existing work practices has occurred in the form of dedicated sample receiving windows at two zonal laboratories, TB work stations, instituting a respiratory protection program, and new SOPs.

This combination of assessment, training, mentoring, and hands-on approach has allowed for practical implementation and sustainment of good biosafety and biosecurity practices throughout the Georgian laboratory network. This can be a good model for other low-resource countries to follow as they implement their biosafety and biosecurity programs.

Key Words/Phrases: Biosafety training, Biosafety & biosecurity, Biorisk management

16. ENHANCING RESILIENCE TO LARGE-SCALE BIOLOGICAL THREATS

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The Transatlantic Collaborative Biological Resiliency Demonstration (TaCBRD) is a collaborative program between the United States (U.S.) Department of Defense (DOD), the U.S.

Department of State (DOS), and the U.S. Department of Homeland Security (DHS). The Partner Nation for this program is the Republic of Poland. The purpose of TaCBRD is to develop and demonstrate a capability for resilience in countering a wide area biological incident (including contagious and persistent threats) that impacts U.S. and Partner Nation civilian and military personnel and key infrastructure.

The capability being developed and demonstrated includes technical solutions and their operational

application for biological incident response and recovery. Research themes include threat activity sensing and reporting, and rapid response and recovery technologies. A primary program focus is improving whole-of-government and partner nation collaboration.

Key Words/Phrases: Biological, Resiliency, Interagency, Partner Capacity

17. ANTHRAX ATTACKS IN THE USA: PUBLIC HEALTH PREPAREDNESS, PAST, PRESENT, AND FUTURE

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The U.S. Anthrax Attacks in 2001 marked the first time that public health became central to emergency response and national security on a wide-scale basis, yet most public health officials were working without adequate resources or training to respond to these types of attacks.

Over the past eleven years, we learned a lot of difficult lessons about what it means to be adequately prepared for bioterrorism.

The U.S. has made many strategic investments and improvements and continue to progress to a response and recovery that enhances its resiliency. Some key areas of progress since then include significant improvements in: preparedness planning and coordination; public health laboratories; vaccine manufacturing; the Strategic National Stockpile; pharmaceutical and medical equipment distribution; surveillance; communications; legal and liability protections; increasing and upgrading staff; and surge capacity.

One of the top lessons we learned is that being prepared means we must sustain enough resources and vigilance so we can prevent what we can and respond when we have to. However, there is a lot left to be done, which will require further effort and investment. Gaps and vulnerabilities still prevent communities from fully preparing to meet the threats of bioterrorism.

Some ongoing gaps today include: major recent budget cuts; a gap in trained public health workers; a gap in surge capacity for mass care during emergencies; a lack of an integrated, national approach to biosurveillance; gaps in supporting the way communities cope and recover from disasters; and gaps in vaccine and pharmaceutical research, development and manufacturing.

Key Words/Phrases: Anthrax, Lessons Learned, Preparedness, Public Health



Anthony Intrepido – Senior Scientist, Homeland Security and Defense Cubic Applications, Inc. Mr. Tony Intrepido is a Senior Scientist with Cubic Applications, Inc. and a board certified industrial hygienist with over 25 years experience in environmental and public health and human health risk assessments. Mr. Intrepido joined the Cubic team in August 2011 and is currently a science and technology advisor to

the U.S. Defense Threat Reduction Agency's (DTRA) Transatlantic Collaborative Biological Resiliency Demonstration (TaCBRD) program. The primary goal is to develop and demonstrate a Department of Defense capability to shape the interagency approach for resilience in countering a wide area biological event that impacts U.S. and Partner Nation key civilian and military infrastructure. Mr. Intrepido is a retired U.S. Army officer. During his 20 years of active duty, he served as a project manager and principal investigator in leading teams of scientists and engineers to conduct studies to investigate the health effects of exposures to, as well as the remediation of, a wide range of chemical, biological, and physical hazards all over the world. As the team leader of the U.S. Army Special Medical Augmentation Response Team, he led this team to the Pentagon on September 11, 2001 in response to the terrorists' attacks. A few days after returning, he led the team to the Nation's Capitol again in response to the 2001 Anthrax Incident. During his three-month response, he led team entries into the contaminated senatorial suite to conduct comprehensive studies concerning secondary aerosolization exposures to *Bacillus anthracis* and dose reconstruction. Mr. Intrepido earned a Bachelor of Science in Environmental Science from Slippery Rock University, a Master of Public Health degree from Tulane University, and a Master of Science in Environmental Health from Harvard University. He is also a graduate of U.S. Army Airborne School, U.S. Army Air Assault School, and the 75th Ranger Regiment Expert Field Medical Badge Testing.

18. NANOTECHNOLOGY, PROMISES AND RISKS

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Nanotechnology based research is the driving force behind a new industrial revolution. Both private and public-sector invested quite heavily in past decade. Nano-scale materials have been used for a decade in applications ranging from window glass and sunglasses to car bumpers and paints. Now, however, the convergence of scientific disciplines (chemistry, biology, electronics, physics, engineering etc.) is leading to a multiplication of applications in materials manufacturing, computer chips, medical diagnosis and health care, energy, biotechnology, space exploration, security and so on. Hence, nanotechnology is expected to have a significant impact on our economy and society in next decade, growing in importance over the longer term as further scientific and technology breakthroughs are achieved. Nanotechnologies will be a major technological force for change in shaping business environment across all industrial sectors in the foreseeable future and are

likely to deliver substantial growth opportunities. The size of the market for nanotechnology products is already comparable to the biotechnology sector, while the expected growth rates over the next few years are far higher due to transition phase from basic research to manufacturing leading to new novel Nanotechnology related product available in global market. At the same time, scientists have raised concerns that the basic building blocks of nanotechnologies-particles smaller than one billionth of a meter-poses a potential new class of risk to health and the environment. Currently the recommendation is for a precautionary approach based on risk research and good risk management to minimize the likelihood of nanoparticles bringing a new dimension to personal injury and property damage losses or posing third party liability and product-recall risks.



Dr. Akbar S. Khan, Senior Microbiologist & Program Manager (YD-3/GS-15), S&T Acquisition Level III & COR Certified Defense Acquisition Corp Certified. Dr. Akbar S. Khan is an interagency lead, senior microbiologist, program manager and subject matter expert (SME) for Chemical & Biological Directorate Basic Sciences Directorate at Defense Threat Reduction Agency. Dr. Khan also

serves as an Agency lead to National Nanotechnology Initiative (NNI) where he coordinates DTRA-CB Nanotechnology activities with NNI does technology watch for CB and run a technology watch seminar series program and coordinating officer to OSD for Dual Use Research of Concern (DURC). Prior to this position, he served as a program manager for Chemical & Biological Directorate Basic/Medical Sciences programs where he managed therapeutics and also managed Transformational Medical Transition Initiative (TMTI) portfolios. Dr. Khan joined DTRA in 2004 and received Director's annual team award for excellence in program management and execution 2006, 2009 and 2011. Dr. Khan is certified at Level III in S&T management and acquisition and also Defense Acquisition Corp Certified. Dr. Khan also served at Office of Secretary of Defense for DTRA to provide managerial and leadership support to manage the Combined Federal Campaign for Department of Defense from 2006 till 2008. Dr. Khan published over 100 manuscripts, six patents, co-edited two books, several book articles and given over 100 presentations to national and international audience. He also served as technical liaison from ECBC for Defense Science Board in 2000, DARPA computational biology Bioscience program from 2004 till 2006 and Bio-threat panel organized by NSF and Intelligence Agencies for Presidential panel in 2003 and serves as a scientific government liaison at National Academy of Sciences in Emerging Sciences for Environmental Protection panel. In past, he served as a consultant with a variety of private Genomics & Biotechnology companies.

19. FOSTERING CAPABILITIES-BASED APPROACHES THAT SUPPORT A MULTI-FUNCTIONAL RESPONSE TO PUBLIC HEALTH EMERGENCIES

Dr. Marina Kozak

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USA

The U.S. faces a host of national health security threats from chemical, biological, radiological, and nuclear (CBRN) agents and emerging infectious diseases. Under the leadership of the U.S. Department of Health and Human Services (HHS), the Public Health Emergency Medical Countermeasure Enterprise (PHEMCE) is the coordinating body for federal agencies working to protect the civilian population from these threats through the use of medical countermeasures (MCMs) – medicines, devices, or other medical interventions – to lessen their health impacts. The PHEMCE Strategy and Implementation Plans are the means by which the federal government communicates its priorities in this area to help inform State, local, territorial and tribal governments. These Plans provide the blueprints the federal government will follow to make the best use of available resources to contribute to national health security through the development and provision of medical countermeasures. Further, they address the full spectrum of response from research needs through planning for dispensing, use and follow-up. To ensure a robust and sustainable product pipeline for medical countermeasures, the PHEMCE emphasizes multifunctional capabilities, including platform technologies, host-based innovations, and broad-spectrum medicines, rather than stand alone outcomes. These efforts consider viable commercial markets, routine public health applicability, delivery, and utilization capabilities at the local level. Intending to move from narrow applications and approaches to those with broader applicability, the goal is to improve cost effectiveness while enhancing response flexibility. This presentation will address the integrated analysis for assessing MCM requirements, capabilities, and responses to mitigate threat consequences.

Key Words/Phrases: capabilities-based approach, end-user needs, MCM requirements



Dr. Marina Kozak – University of Pennsylvania, PhD, May 2010, Cellular and Molecular Biology (Cell Growth and Cancer). Professional Experience: AAAS Science and Technology Science Policy Fellow, Washington DC, Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response (ASPR); Division of Medical Countermeasure Strategy and

Requirements (MCSR): Provide technical advice and guidance regarding policy development, Research, gather data, and coordinate activities with key stakeholders concerning chemical, biological, radiological, or nuclear incidents, Coordinate inter-agency working groups that facilitate Medical Countermeasure development and acquisition in support of emergency preparedness and response, Lead capability assessments to identify gaps and develop policies and systems to ensure preparedness and resilience

20. CENTRALLY AND PERIPHERALLY ACTIVE ACHE INHIBITORS – PROPHYLAXIS AGAINST NERVE AGENTS

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Peripherally and centrally active cholinesterase inhibitors are considered to be potential prophylaxis for nerve agent intoxication. Among them, the carbamate inhibitors (e.g. pyridostigmine bromide) are used as organophosphate pre-treatment strategy in many countries, or tacrine was used as Alzheimer's disease drug worldwide. These compounds caused in the past serious side-effects (e.g. gastro-intestinal, hepatotoxicity).

The novel compounds were designed as simple bispyridinium or tacrine analogues. They showed inhibitory ability towards hAChE in vitro that was further rationalized by molecular modeling studies. The toxicity (LD₅₀) and protective ratio of selected compounds against soman induced toxicity was determined. Some of the prepared compounds formerly showed both inhibition of cholinesterases and modulation of muscarinic or nicotinic receptors that take crucial part in animal survival after organophosphate induced toxicity.

Acknowledgement: This work was supported by a long-term organization development plan 1011.



Kamil Kuca, prof. Ph.D. Research Focus: Acetylcholinesterase reactants as treatment of nerve agent and pesticide intoxications; Acetylcholinesterase inhibitors in Alzheimer's disease and Myasthenia Gravis treatment; Synthesis of the detergents as disinfectants, decontamination means and environment for micellar catalysis; Drug design and Development; Chemical warfare

agents; Project Management; Scientific Management; Technology Transfer; Toxins. Education: Professor University of Defence, Faculty of Military Health Sciences, Hradec Kralove, CZ (branch Toxicology, 2012) Assoc. prof. University of Defense, Faculty of Military Health Sciences, Hradec Kralove, CZ (branch

Toxicology, 2009) Ph.D. University of Defense, Faculty of Military Health Sciences, Department of Toxicology, Hradec Kralove, CZ (branch Toxicology, December 2005) – supervisor – prof. Jiri Cabal, Ph.D. MSc. Institute of Chemical Technology, Department of Organic Chemistry, Prague, CZ (branch Organic Chemistry, 2001). Professional career: Head, Biomedical Research Center, University Hospital, Hradec Kralove (since 2011), Vice-Dean for Research – Faculty of Military Health Sciences, University of Defense, Hradec Kralove Czech Republic (2009-2012), Research and Development at the Centre of Advanced Studies, Faculty of Military Health Sciences, University of Defense, Hradec Kralove, CZ (2006-2009), Lecturer at the Department of Chemistry, Faculty of Sciences, J.E. Purkinje University, Usti nad Labem, CZ (2006-2012), University teacher and Research fellow at the Department of Toxicology, Faculty of Military Health Sciences, University of Defense, Hradec Kralove CZ (2001-2006).

21. MULTI-FUNCTIONAL SOLUTIONS FOR CBRN DECONTAMINATION IN THE CONTEMPORARY OPERATING ENVIRONMENT

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The author considers CBRN decontamination and specifically the need to acquire capabilities that are multifunctional to cater for a broad spectrum from accidental release of hazards to major combat operations.

At times of financial austerity multifunctional solutions present excellent investment options for the future. Expensive sensitive equipment must be protected, and finally environmental considerations are an increasingly important feature in decontamination and waste disposal. Current doctrine is questioned in the separate deployment of stations each requiring their own real estate, water and manpower resource, with the further requirement for support personnel, and potentially Force Protection on top of that.

A new philosophy sees decontamination carried out at one station only, reducing the amount of resource and time to decontaminate.

An increasing reliance on complex technological solutions for enhancing military capability as well as expensive platforms to convey systems, sub-systems, personnel and materiel has resulted in increased vulnerability to CBRN hazards. The decontamination of sensitive equipment does not lend itself to aqueous-based decontamination.

The author will elaborate on a simple and unique non-aqueous solution that is immediately ready to use. In conclusion, multifunctional solutions, an adaptive mindset and technological innovation offer the greatest CBRN decontamination insurance in response to an unpredictable future; particularly so during times of austerity and limited resource.

Key Words/Phrases: decontamination, multifunctional, sensitive equipment, technological innovation



Maj. (Ret) Marc Jacoby – My name is Marc Jacoby. Since 01 October 2003, I am a retired Major from the Belgian Army. I served in the Belgian Armed Forces in the Corps of Engineers during 39 years. I have been concerned by CBRN matters for more than 30 years be it as primary or secondary function. In March 1999, I became the Chief of the CBRN Defence Study Office of the Belgian MoD and at the

same time a CBRN expert for NATO. I represented Belgium in several technical and doctrinal committees, working groups and agencies (NATO Standardisation Agency, NATO Training Group, AC 225 Land Group 7, Long Term Scientific Study, NATO Working group on CBRN COLPRO, Working Group on IPE, ATP 45 and AEP 45, AJP 3.8...). I was in particular the custodian of a standardisation document (STANAG) on "Contamination Control Policy for NATO Forces". In that function, I was also responsible for all Belgian acquisition programs in relation with CBRN equipments and products especially, for large scale decontamination stations. I am now acting as CBRN Defence Advisor for Cristanini Company in Italy.

22. ELECTRONIC SOLUTIONS FOR IMPLEMENTING, TRACKING AND AUDITING HSE PROGRAMS

Patricia Olinger, RBP

Elizabeth R. Griffin Research Foundation

Emory University

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USA

For Health Safety and Environmental (HSE) Professionals, keeping up with Research information as it relates to HSE aspects is challenging. As the risk increases so does program complexity. This talk will review using tools readily available for HSE data gathering and data management that did not exist 5 years ago. Focusing on the benefits of learning, understanding and keeping up with today's technology and its impact on developing more effective and efficient HSE programs.

Whether you are in the field gathering data using an iPad, or reviewing a "cloud" based dashboard as an Institutional Leader/Donor monitoring progress of program implementation, today's technology can allow institutions to readily accomplish this.

Assessing facilities and identifying existing gaps allows institutions to strategically focus attention and resources in executing their respective HSE programs. While the examples discussed focus on Biorisk Management Program management utilizing tools such as Google Docs, iFormBuilder™ mobile platform for data collection and audits and Relavance Solutions CAMSTM (Compliance Activity Management Software), the technology and methodology is applicable to any HSE discipline.

Key Words/Phrases: Biorisk Management, HSE Electronic Solutions, Relavance CAMS, iFormBuilder, iFormBiorisk.



Patricia Olinger, RBP – Ms. Patricia Olinger is the Director of the Environmental, Health and Safety Office (EHSO) for Emory University. EHSO has University-wide responsibility for developing, implementing and maintaining EHS programs to control occupational exposures and to oversee the implementation and compliance with the mandated federal/state laws, regulations, and guidelines.

Ms. Olinger serves on the Board of Directors for the Elizabeth R. Griffin Research Foundation and is the current the Vice-President for the Campus Safety Environmental Management Association. Previously, Ms. Olinger spent 21 years in the Pharmaceutical Industry, has served on the Scientific Advisory Board for the NIH – National Biosafety and Biocontainment Training Program, was a council member for the American Biological Safety Association, and the ABSA representative and steering team member for the CEN Workshop Agreements relating to Biorisk Management Systems: 15793:2011 and 16393:2012.

23. MODELLING OF BEHAVIOUR OF SODIUM ARSENITE IN SOILS

Vadim Petrov

Marina Shumilova, Olesya Nabokova, Marina Lebedeva
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For the purpose of definition of possible consequences of destruction of CW on objects of environment we had been studied behaviour of sodium arsenite in soils. Sodium arsenite is formed at neutralization by a method of alkaline hydrolysis arsenic containing CW- lewisite. Lewisite it was stored on object in Kambarka where works on the CWD are finished, and also it is stored on object in Kizner in artillery shells. In Kizner works on the CWD should begin in the near future. Sodium arsenite it is well dissolved in water and has high toxicity. It the risks connected with hit of this substance in objects of environment, in particular in soils speak.

At the special laboratory stand and at field tests mobility researches have been carried out of pollution of sodium arsenite in soil. Mobility in soil defined taking into account features of a filtration of an atmospheric influence in the form of a rain on the polluted part of soil. The analysis of mobile forms of arsenic carried out a method of atom absorption spectroscopy. High mobility of sodium arsenite in the polluted soils has been established, parametres of mobility are calculated and mechanisms of delocalization of pollution taking into account features of a filtration of an atmospheric influence in the form of a rain through soil are defined.

The obtained data allow to make changes to procedure of monitoring of objects on the CWD, and also to develop necessary actions for sanitation of the polluted territories after end of this works.



Shumilova Marina A. – In 1982 she graduated from Udmurt State University by specialty chemistry and started to work in Izhevsk State Agricultural Academy as junior researcher. In 1984 she entered the post-graduate course in Institute of Chemistry of the Ural Branch of the Russian Academy of Sciences in Sverdlovsk (now it is Yekaterinburg). In 1989 she graduated from the post-graduate course and came

back to Udmurtiya in Izhevsk and started to work in the Institute of the Applied Mechanics of the Ural Branch of the Russian Academy of Sciences as researcher officer. In 1998 she defended the thesis in the sphere of voltammetry of heavy metals and obtained the degree of Ph.D in Chemistry. In 2005 she was awarded the title of associate professor in the specialty. Since 1998 she is a senior research officer in the Laboratory of the environmental protection and natural resource conservation technologies of Institute of Applied Mechanics of UrB of RAS. Her research interests are electrochemical and spectroscopic methods of analysis, development of highly selective ways voltammetric determination of metals in multicomponent systems, ecoanalytics and safe destruction of chemical weapons, especially in Udmurtiya, where two facilities under CW Convention, in Kambarka and Kizner settlements. She is the author of more than 70 publications dealing with these and some other ecological problems. She's expert on environmental problems of chemical disarmament and in environmental analytical chemistry. She was in Organizing Committee of the International Conferences on destroy of chemical weapons "Chemical Disarmament, Ecology and Technology – CHEMDET-I, II, III", which were held in Izhevsk in 1996 and 2000, 2009.

24. THERMAL NEUTRALIZATION OF REACTIONARY MASSES OF DESTRUCTION OF PHOSPHORORGANIC CW

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According to the Program of destruction of CW now in the Russian Federation neutralization of phosphororganic substances (POS) on technologies with use of reagents is spent. One of problems of use of such technologies of destruction of CW is necessity of neutralization of a considerable quantity of reactionary masses and the polluted materials, several times exceeding quantity of initial CW, for example, for object in settlement Kizner (Udmurtia, Russian Federation).

Neutralization of reactionary masses of destruction of CW for POS is effective is carried out by a method of high-temperature incineration. In particular this technology has been used for neutralization of reactionary masses of destruction of POS from object Newport (Indiana, USA).

We consider possibility of use of technology of high-temperature incineration with use industrial incinerator, let out Joint-Stock Company "Safe Technologies" (Sankt-Petersburg) for neutralization of reactionary masses of destruction of POS. The technology assumes

burning of substances at temperature 850-950 °C, reburning of smoke gases is a lot of oxidizer at temperature 1100-1200 °C.

Clearing and fast cooling of departing gases is spent in a dry scrubber at introduction to gases of alkaline reagent. The technology allows to carry out decomposition of the toxic substances containing in reactionary masses, excludes formation dioxin-like substances above norms of ecological safety, allows to utilize the substances formed at clearing of departing gases.

Advantage of use of a method of thermal neutralization to reactionary masses of the CWD is also possibility of a reshaping of objects on destruction of CW after end of conventional works for neutralization of dangerous industrial wastes, sub-standard pesticides, a medical waste.

25. COMPREHENSIVE APPROACH TO ANALYZE POWDER SAMPLES FOR PRESENCE OF BIOLOGICAL TOXINS

Dr. Christopher Pöhlmann

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The ricin findings in the US postal system clarified the urgent need to develop rapid, sensitive and specific detection systems for biothreat agents such as biological toxins. Here, we present a comprehensive approach to analyze powder samples for presence of biological toxins. In a first step, mobile infrared spectroscopy is used for screening powder samples to achieve rapid discovery of hoaxes and fakes. In a second step, preliminary identification by a portable toxin detector based on electrochemical enzyme-linked immunosorbent assay procedure is performed. Within less than 25 minutes a powder sample is automatically analyzed for the presence of the five bioterroristic relevant toxins botulinum neurotoxin serotypes A, B and F, staphylococcal enterotoxin B and ricin. In a final laboratory-based step, confirmation of toxin identification is done by a MALDI-TOF MS based approach using immunomagnetic separation as sample preparation step. After comparison of obtained mass spectra with reference library entries of different biological toxins the software algorithm calculates a score-based ranking of identified toxin. This comprehensive approach allows sensitive and extremely reliable toxin identification from various powder samples.

Key Words/Phrases: Biological toxins, infrared spectrometry, electrochemical biochip, MALDI-TOF MS



Christopher Pöhlmann works as application specialist for bioagents detection devices since June 2010 for Bruker Daltonik GmbH. The company has long standing experience in development and manufacturing devices and applications for mass spectrometric analysis of biological and chemical substances. Beside life science applications (e.g. MALDI-TOF MS based identification of microorganisms), Bruker Daltonik GmbH has been the market leader of CBRNe detection equipment for over 20 years. As application specialist he is responsible for the development and application of detection technologies for bioagents, e.g. using electrochemical ELISA technology for toxin identification, application of PCR for detection of bacteria and viruses and utilization of mass spectrometry for confirmatory identification of bacteria and toxins. Christopher Pöhlmann has a M.Sc. in Molecular Biotechnology from the Technical University of Munich (2006) and a PhD in Biochemistry from the University of Bayreuth (2010). During his Master's thesis he worked at the department of virology at the Paul-Ehrlich-Institute and investigated the vaccinia virus protein E3 in vivo function. In course of his PhD thesis he worked on the electrochemical detection of RNA using nucleic acid hybridization on biochips.

26. DISASTERS AND CBRNE EVENTS: AN APPLICATION OF CIVILIAN AND MILITARY COOPERATION

The Italian project of ANA – Alpini Field Hospital and EI Acismom to cope with the increasing risk for CBRNE and disasters

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Natural and complex disasters may produce a massive number of casualties that overwhelm the ability of the local health care systems to provide the required needs.

Damages to the health care structures will further compromise the delivery of health care services. In addition to this, the huge number of casualties induced by a CBRNE incident will put a tremendous

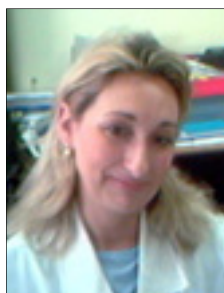
strain to the community's health care system, considering that victims might leave the scene, being contaminated while attempting to seek medical care on their own.

Field Hospitals (FHs) may provide temporary care for casualties and be a substitute for a destroyed hospital in the aftermath of sudden onset disasters. The Authors describe one of the models of Mobile Field Hospital of ANA (Association of Italian Alp Troops) who have worked and works in case of natural disasters, humanitarian emergencies.

The Authors would also like to suggest an alternative method to approach civilian and military cooperation and partnership to better respond to possible CBRNE events.

In particular the Authors indicates the importance to create a new model of integrated medical response asset, which involves ANA Field Hospital and the EI ACISMOM Military Corp (Special Corps of Sovereign Military Order of Malta) with expertise in CBRN management and preparedness, with the intent to create a cooperative group, for response to cope with the increasing risk of major medical incidents as well as the preparation of temporary hospitals to be used in case of non conventional attacks.

Key Words/Phrases: Disasters, CBRNE, Field Hospitals, Military and Civilian cooperation



Alessandra Rossodivita, M.D., EMDM – Dr. Alessandra Rossodivita works in San Raffaele Hospital Scientific Foundation- University of Medicine "Vita-Salute" as Head of Semi-Intensive Cardiac Surgery Unit. She is a cardiologist and disaster specialist; member of WADDEM from 2007- WORLD ASSOCIATION for DISASTER and EMERGENCY MEDICINE; member of PUBLIC ORGANIZATION INTERNATIONAL

INFORMATIZATION ACADEMY of Moscow (IIA), Public Organization in General Consultative Status which the United Nations from 1995. In 2008 she won a NATO Science for Peace Grant Project with the Russian Federation Partnership (NATO-SPS Science for Peace Program). Actually she cooperates in Maxi-Emergencies and Humanitarian medicine with ANA (Italian Association of " Alpini" a military corp, and works in their Field Hospital. She also cooperates with the Sovereign Military Hospitaller Order of St. John of Jerusalem of Rhodes in Maxi-Emergencies and CBRNE preparedness and teaching activity. Actually she is working in different research projects on net security development, cyber terrorism and CBRNE preparedness.

27. BIOSAFETY AND BIOSECURITY FRAMEWORK IN ARMENIA

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The US Cooperative Biological Engagement Program (CBEP), in accordance with the Government of Armenia (GoAM), initiated laboratory biosafety and biosecurity (BS&S) assessments at the central human and animal diagnostic and surveillance laboratories that work with Especially Dangerous Pathogens (EDP). Consequently, several BS&S program improvements based on international BS&S standards were recommended. BS&S training for EDP laboratory specialists was conducted using US Defense Threat Reduction Agency (DTRA) biosafety training materials. A mentoring program for lab staff was implemented to reinforce BS&S knowledge for each trainee at their local laboratories.

The mentoring program included monthly visits to each lab, principles and practice of lab biosafety, personal protection, disinfection and decontamination techniques, chemical hygiene, and waste handling. Special attention was given to the writing of Biosafety Manuals and SOPs. In the future, these trainees may be designated as Biological Safety Officers in their facilities.

A critical piece of the EDP program is to have a procedure for annual certification of biological safety cabinets (BSC). To sustain this certification process, CBEP will train local certified engineers and provide necessary equipment so they can conduct annual BSC certifications. Progress of BS&S assessments, training, and mentoring at each laboratory and for each individual is documented on a BS&S Matrix that is updated monthly. The GoAM created a Joint Working Group, consisting of representatives from different Ministries, laboratories and Universities, that collaborates regularly with CBEP on this project. This an example of how to design a framework for a practical and sustainable BS&S program in Armenia.

Key Words/Phrases: Biosecurity upgrade, BS&S training, BS&S Matrix

28. DUTCH BIOSECURITY TOOLKIT TO ENHANCE SELF REGULATION

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In order to decrease the threat of bioterrorism, the Dutch government has initiated a national project to install a coordinated Biosecurity Regime,. Amongst other initiatives a Biosecurity Toolkit was developed to enhance biorisk management inside organizations working with hazardous biological materials.

This toolkit consists of two parts:

1. a self assessment module to identify potential gaps in the biosecurity regime inside an organization;
2. the related legal basis and a set of good practices to improve the level of biosecurity.

The toolkit addresses eight issues: Awareness, personnel reliability, transport security, information security, accountability for materials, incident response, management, and physical measures.



Dr. Sander Banus is working at the National Institute of Public Health and the Environment (RIVM), the Netherlands since 1998. After finishing his PhD in medical science on the topic of whooping cough he started working at the Advisory Service for the Inspectorate, Environment and Health division on the topics CBRN and Biosecurity. Sander is involved with the environmental incident service as

team leader of the national CBRN sampling team and as biological incidents expert. Sander was project manager of the development of a mobile BSL-3 laboratory that can be assessed to the field in case of CBRN related incident. Since 2010 he is responsible for the project bureau for the establishment of a Dutch biosecurity regime.

29. U.S. NUCLEAR DEFENSE POLICY

LTC Dr. Tobias Vogt

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Washington, DC 20340
USA

This article, based on the forthcoming book, *Combating the Bureaucracy: U.S. Nuclear Defense Policy Development and Implementation* following the Cold War, examines the United States government's approach to nuclear defense between 1989 and 2009. The article discusses individual and collective findings from five case studies related to the nuclear defense areas of prevention, protection, and response.

The development studies – strategic arms reduction and national missile defense – suggest that varying stakeholder positions and multiple action channels for national policy development resulted in a patchwork of nuclear defense policies that were uncoordinated, inconsistent, and at times, in conflict.

The implementation studies – threat reduction, maritime radiation detection, and nuclear forensics – depict programs within the U.S. Departments of Defense, Energy, and Homeland Security.

These studies examine how the United States government implemented evolving post-Cold War nuclear defense policy, and the extent to which corresponding objectives were realized. In the context of nuclear defense, the implementation studies suggest that a segregated federal design underlay individual department approaches to policy execution.

Key Words/Phrases: Nuclear Defense Policy

LTC Tobias Vogt, Ph.D. – U.S. Army Professor of Strategic Intelligence School of Science and Technology Intelligence National Intelligence University. Lieutenant Colonel Tobias Vogt, Ph.D. is an active duty Army officer that has served in Cavalry, Infantry, Special Forces, and Nuclear and Counterproliferation assignments. He is a veteran of operations Desert Shield/Storm, Enduring Freedom, and Iraqi Freedom, with overseas service in Europe, the Middle East, Latin America, Asia, and Africa. Dr. Vogt earned his Ph.D. in War Studies from King's College, London, where he specialized in U.S. nuclear defense policy. He is also a graduate of the Master of Policy Management program at Georgetown University, and the Master of Arts in Diplomacy and Military Studies, and Bachelor of Arts in International Studies programs at Hawaii Pacific University.

30. COMBINED EFFORT ENHANCES SUCCESS

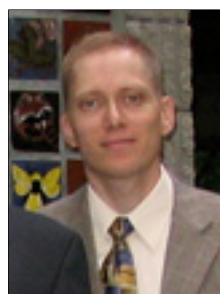
LTC Scott Sinkular

US European Command's nuclear weapon accident program
USA

An effective response to a CBRN incident will require close cooperation between civilian and military response organizations. Depending on the magnitude or location of the event neighboring countries may also be involved. Effective and efficient civilian – military and bi-lateral response requires prior coordination and planning.

This presentation offers a model to help disparate entities come together and bring their capabilities and resources to bear to address the CBRN incident. Components of the model include command and control, operations, public information, and health and safety.

The first step is to understand civilian response structure first and then determine how best to apply host nation military or a neighboring country's capabilities. The presentation will highlight the importance of developing priorities and the means to adjudicate when they conflict. The approach is tailor able and could be modified for other humanitarian or disaster response scenarios.



Lieutenant Colonel Scott Sinkular

assumed his current duties implementing US European Command's nuclear weapon accident program in July 2012. He plans and executes training events for US response forces and organizes bilateral working group activities to strengthen the collective response. Originally commissioned as a Second Lieutenant in May 1992 in the

United States Air Force, he used the blue – to – green program to join the United States Army as a nuclear and counterproliferation officer, (FA-52) in May 2007. Scott's Air Force assignments include the Air Force Technical Applications Center (Patrick AFB, FL) as monitoring operations officer for the nuclear test ban treaties, the STRATCOM Joint Intelligence Center (Offutt AFB, NE) as a nuclear team chief, and the Warrior Preparation Center liaison to EUCOM (Patch Barracks,

GE). In the Army, LTC Sinkular was first assigned to DTRA's Research and Development Enterprise (Ft Belvoir, VA) as a systems engineer tasked with developing nuclear detection architectures and full motion video exploitation tools for counter IED missions in OIF. Next, he served as the deputy director of the Office of Nuclear Weapon Stockpile, National Nuclear Security Administration, Department of Energy (Washington DC). There he managed a \$500M budget at the production plants and national laboratories to extend nuclear warhead service life, produce limited life components, and conduct surveillance activities. LTC Sinkular earned a BS in Physics (Cum Laude) from the University of Nebraska in 1992 and a MS in Nuclear Engineering from the Air Force Institute of Technology in 1999.

31. NC-CBRN CM: CONCEPTS, OPPORTUNITIES AND CHALLENGES

Wang Wei

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China

Management takes on the characteristics of its Age. Network Centric Chemical Biological Radiological Nuclear Consequence Management (NC-CBRN CM) continues this trend – it is the response to both the challenges and the opportunities created by the Information Age. In this on-going age, threat and operating environments have changed. In CM issues, we need to communicate and share accurate information; to detect early, respond quickly, and contain; to work together, build capacity and share resources; to synchronize the plans. We are gradually appealing to information technologies and concepts sourcing from physical, information and cognitive domains, and we are reaping significant gains through these technologies and concepts, particularly network centric ones, which enable geographically disparate operational forces to reach back to a central focal point for support. The purposes of this paper are to describe the NC-CBRN CM concepts; to explain how it embodies the characteristics of the Information Age; to identify the challenges in transforming this concept into a real operational capability; and to suggest a prudent approach to meeting these challenges.

Key Words/Phrases: Network Centricity, CM, CBRN, Information Technology



Wang Wei – Education: Bachelor of Engineering (2006-2010) – Major: Computer Science and Technology, Tsinghua University. Master of Science (2010-2012) – Major: Military Preventive Medicine, Academy of Military Medical Sciences, Supervisor: Mao Jun-wen. Doctor of Science (2012- up to the present, degree expected in 2015) – Major: Military Preventive Medicine, Academy of Military

Medical Sciences, Supervisor: Mao Jun-wen. Research experience – Strategic research: Experience in strategic study of IT solutions, applications and management. CBRN Consequence Management: Experience in emergency management theory and practice.

32. THE PUBLIC HEALTH EMERGENCY MEDICAL COUNTERMEASURE ENTERPRISE (PHEMCE) APPROACH TO END-TO-END MEDICAL COUNTERMEASURE POLICY

Dr. Elaine Wencil

U.S. Department of Health and Human Services (HHS)

Public Health Emergency Medical Countermeasure Enterprise (PHEMCE)

USA

The U.S. faces a host of national health security threats from chemical, biological, radiological, and nuclear (CBRN) agents and emerging infectious diseases. Under the leadership of the U.S. Department of Health and Human Services (HHS), the Public Health Emergency Medical Countermeasure Enterprise (PHEMCE) is the coordinating body for federal agencies working to protect the civilian population from these threats through the use of medical countermeasures (MCMs) -- medicines, devices, or other medical interventions --- to lessen their health impacts. The PHEMCE is comprised of representatives from the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), the Food and Drug Administration (FDA) and interagency partners at the Department of Veterans Affairs (VA), Defense (DoD), Homeland Security (DHS), and Agriculture (USDA). The PHEMCE Strategy and Implementation Plans are the means by which the federal government communicates its priorities in this area to help inform State, local, territorial and tribal governments. These Plans provide the blueprints the federal government will follow to make the best use of available resources to contribute to national health security through these strategic goals: (1) Identify, create, develop, manufacture, and procure critical medical countermeasures; (2) Establish and communicate clear regulatory pathways to facilitate medical countermeasure development and use; (3) Develop logistics and operational plans for optimized use of medical countermeasures at all levels of response; and (4) Address medical countermeasure gaps for all sectors of the American civilian population. This PHEMCE process for end-to-end management of CBRN MCM will be discussed.

Key Words/Phrases: Medical Countermeasures (MCM), Consequence Management, Policy, Research and Development, Regulatory

Dr. Elaine Wencil – EDUCATION: 10/03 – 01/09 University of Pennsylvania, School of Arts and Sciences, Philadelphia, PA, Ph.D. in Psychology (Cognitive Neuroscience), 9/02 – 10/03 University of Pennsylvania, School of Arts and Sciences, Philadelphia, PA, M.A. in Psychology, 8/95 – 5/99 Cornell University, College of Human Ecology, Ithaca, NY. PROFESSIONAL EXPERIENCE: US Department of Health and Human Services, Provide expert advice and support in carrying out the medical countermeasure mission as defined under Pandemic and All-Hazards Preparedness Act (PAHPA), including activities to implement PAHPA. Provide technical direction regarding policy development, strategic planning and implementation, research, data gathering, coordination, and outreach activities concerning chemical, biological, influenza, or other emerging infectious disease outbreaks. Provide essential

input and recommendations for decision-making on public policy initiatives, including Congressional and Executive branch initiatives. Served as Executive Secretary (acting) responsible for managing the development of emergency declaration content for the inter-agency Public Readiness and Emergency Preparedness (PREP) Act Working group. Serve as a technical lead and responsible for authoring requirements documents, facilitating interagency discussions for the Strategic National Stockpile (SNS) Annual Review, organizing workshops, and briefing leadership leading to the acquisition of chemical threat medical countermeasures. Served as a facilitator at 4 Public Engagement sessions to gain direct input on medical countermeasures distribution and dispensing that have informed policy initiatives. Serve as co-chair of internal and interagency working groups to implement Executive Orders and Public Health Implementation Plans.



Yu Shuang-ping was born in 1981 in Cheng'an County, Hebei Province, China. As an officer of the People's Liberation Army (PLA) of China, I got my Degree of Management Master of Information Science from the Academy of Military Medical Sciences, PLA in 2008. From 2008 to 2011, I worked there. Before and after graduation, my work has been concentrating on military preventive medicine. And

now I am a doctoral candidate studying emergency medical relief in the Academy of Military Medical Sciences.

33. THE NATIONAL STOCKPILE SYSTEM OF EMERGENCY MEDICAL ITEMS IN CHINA: THE WAY AHEAD

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China's stockpile system of emergency medical items, including National Pharmaceutical Stockpile, part of National Stockpile of Disaster Relief Items and veterinary stockpile, is introduced about their development history, administration changes, fund supports and stockpile contents.

Unlike many developed countries, the Ministry of Health of China administrates no stockpile of emergency medical items itself, and the main stockpile system with China's characteristics is summarized into one figure.

The development plan of China's emergency stockpile system from 2011 to 2015 is briefly stated. Then both of the US Strategic National Stockpile of emergency medical items and National Veterinary Stockpile that play a key role in dealing with natural disasters, CBRNE terrorisms or incidents, devastating animal health emergencies are reviewed.

Based on comparison with the US, the development trends of China are then summarized into three levels of strategic, operational and tactical perspectives such as strengthening multinational cooperation, integrating stockpile system and developing commercial services.

Key Words/Phrases: CBRNE, National Pharmaceutical Stockpile, veterinary stockpile, disaster medical relief, civil-military cooperation

34. WIDE AREA RADIATION SURVEILLANCE WITH SEMICONDUCTOR DETECTORS

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The Real Time Wide Area Radiation Surveillance System (REWARD) is a novel mobile system for radiation detection and monitoring based on the integration of two new miniaturized solid-state radiation sensors. One sensor is a CdZnTe detector for gamma radiation with precise energy measurement to identify the emitting isotope. The other sensor is a highly efficient neutron detector based on novel silicon technologies and a converter material. These detectors form the core of a sensing unit (or tag) which also includes a wireless communication interface to send the data remotely to a monitoring base station as well as a GPS unit.

REWARD tags are small, mobile, portable modular units in the sense that virtually any number of sensing modules in a network is feasible, allowing the flexible adaption of the system to the end user needs. They can be deployed in patrol vehicles, emergency units and in general in any type of mobile equipment. Stationary installations inside buildings or infrastructure are also feasible.

The use cases of REWARD are a number of scenarios ranging from nuclear terrorism threats and lost radioactive sources to nuclear accidents. This is reflected in end users participation to REWARD project, including the Civil Protection from Campania (Italy) and the Spanish Guardia Civil.

This presentation will introduce the REWARD project, funded within the EU 7th Framework Program. Particular emphasis will be placed on the novel radiation detectors of REWARD and how the system can be used to protect cities and other key locations from nuclear threats.

Key Words/Phrases: Real Time Wide Area Radiation Surveillance System (REWARD); CdZnTe detector for gamma radiation; Neutron detector based on novel silicon technologies; Small, mobile, portable, modular sensing units (tags) with wireless communication interface; Scenarios ranging from nuclear terrorism threats, loss of radioactive sources to nuclear accidents



Dr. Ulrich Parzefall holds a Diploma in Physics from Hamburg University, and a Ph.D. from the University of Liverpool, which he obtained in 1999. Since then, he has had 12 years' further experience in the field of particle detector design. This includes a post as a CERN research fellow, which he held until 2003. Since then, Ulrich has had eight years' experience designing and building

semiconductor radiation detectors as a Senior Researcher at the University of Freiburg.

35. CHEMICAL INCIDENTS AT MAJOR PUBLIC EVENTS? FOCUSING ON THE ESSENTIALS

Daniel Kaszeta
Strongpoint Security
London
UK

All too often, plans for responding to mass casualty incidents at major public events become too complex for their own good. Decision-making gets entwined in byzantine command structures. Large efforts are expended on detection and identification without proper support from the current technology. Some important fundamentals are ignored or assumed to be in good order when they are not.

The harsh reality is that complex plans take time to implement? time that is not available in chemical incidents. The author's research performed while writing a book on CBRN incidents at major public events shows that rather a lot of effort is expended on activities peripheral to success or failure during the first hour of response after a chemical incident. The author defines an essential time imperative and a rescue imperative that are critical to incident management.

The proper focus in such events should be on speed, rescue, and the five elements of basic life support? airway management, breathing support, circulation, drugs, and decontamination (ABCDD). The paper also highlights areas where too much effort has been expended.



Daniel J. Kaszeta has worked for Smiths Detection, in the United Kingdom, since 2008. He is the business manager for sales to the Central and Eastern Europe. Prior to joining Smiths Detection, Dan has served as a Chemical Officer in the US Army Reserve and Maryland Army National Guard. He worked for the US government as a civil servant for twelve years, serving in several CBRN-related positions in

the Department of Defense, Department of the Treasury and the Department of Homeland Security. Mr. Kaszeta holds BA and MA degrees.

36. CREATING LOCAL SANCTUARIES FOR VICTIMS OF CHRONIC DISEASE AND THE MITIGATION OF LOCAL EXPOSURE TO CONTAMINANTS

Prof. Dr. Peter Leitner
Higgins Counterterrorism Research Center
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USA

Victims of chronic disease face dramatic threats to their survival in the event of an interruption in the distribution of pharmaceuticals during a national crisis. While pharmaceuticals for the prophylaxis of weaponized biological agents and virulent diseases are the principal focus of national stockpile policies, the care of persons requiring daily medications for diabetes, those with respiratory conditions, and a wide variety of other critical maintenance medications, are not included as a serious component in these emergency programs. Issues concerning cost, shelf-life, and logistical and regulatory complexity dominate the determination of what can and cannot be included in national pharmaceutical stockpile programs. As a result, decision-making is forced down from the national to state or local level. A related issue concerns the creation of large numbers of very small local sanctuaries for the purpose of distributing emergency supplies to the civil population in the early phases of a sudden onset health emergency. Such sanctuaries could contain prepositioned, non-perishable, items to include filtration masks, eye and ear wash kits, anti-bacterial materials and, in some cases non-narcotic prescription medical supplies for pre-approved local residents. Mobilizing local health professionals such as dentists, doctors, nurses, etc., to maintain dedicated refrigerated storage cabinets in their offices could form the core of such a casualty mitigation effort.

Key Words/Phrases: Stockpile, Pharmaceutical, Sanctuary, Chronic Disease, Emergency

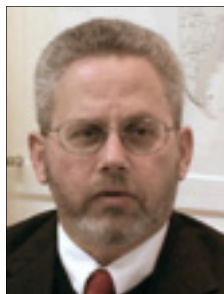
37. COMMERCIAL TRADE IN ACTIVE PHARMACEUTICAL INGREDIENTS (API's): SECURITY RISKS POSED BY BIOREGULATORS

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Commercial trade in Bio-pharmaceutical pre-cursor materials or API's from international sources provides a window into the business practices of many suppliers that should be of major concern to the national security and CBW communities. For instance, when dealing with some countries, the intentional routine shipment of unmarked, unlabeled, and poorly packaged materials is designed to avoid export duties -- or tracking from Home Country Customs and Tax authorities -- creates a series of security and proliferation issues as well as serious commercial concerns. From a domestic U.S. perspective, American-based manufacturers of APIs face little regulatory oversight, particularly if they do not intend to market their products within the territory of the United States. Thus allowing a malefactor to "fly under the radar" while manufacturing extraordinarily potent bioregulators and other Pharma-based products for nefarious purposes. The potency of the product produced will be a direct result of the internal skills of the development team and the processes they employ. In addition, the product or weapon created will have pre-dilution/pre-dosage potency and can be in a lyophilized or liquid form thus creating a potentially effective weapon against individuals or small to medium sized groups via injection, ingestion or inhalation. The only uncertainty about the potency of the agent delivered to a final target would be the environmental conditions it was exposed to during shipment.

Key Words/Phrases: Active Pharmaceutical Ingredients, Bio-pharmaceutical, Bio-regulators, Regulatory Oversight



Prof. Dr. Peter Leitner is the President of both the Higgins Counterterrorism Research Center and the Washington Center for Peace and Justice and the former President of Maxwell USA, a multinational pharmaceutical firm. Dr. Leitner who earned his doctorate from the University Southern California and has four Master degrees, was a founding faculty member of the National

Center for Biodefense at George Mason University and has served on the faculties of Mount Vernon College, and Southeastern University. He has been a Senior Fellow with George Washington University's Center for Advanced Defense Studies, and the Advisor on Terrorism with New York University's Law School.

38. CURRENT SCENARIOS AND TREND IN NATURAL, ACCIDENTAL AND CBRNe EVENTS: EVOLVING SUPPORT OF FUTURE STRATEGIES FOR THE NEW DIMENSION OF TERRITORIAL THREATS

Prof. Roberto Mugavero

University of Rome "Tor Vergata"
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DIE Rome, Italy
Observatory on Security and CBRNe Defence
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In recent years global environmental, geopolitical and economic changes lead to significant changes, at international as well as at national level, in the general risk profile, with influence on the global CBRNe threat and characterized by different and emerging problems and issues, dynamic and changing risk scenarios and new challenges.

To address all this we have to improve and reinforce organization and integration of all human, instrumental, technological and financial resources adopted to face the different events also by means of an holistic, integrated, comprehensive and multidimensional approach. In relation to this the key elements and factors to take into account for the optimization of preparedness, mitigation and response are: intelligence, multidisciplinary, resiliency, territorial and infrastructure surveillance and control, human and instrumental resources management, information management, contingency and emergency plans, defence of global commons and public/private partnership for cooperative security.

This paper would like to underline the current situation of territorial risk and CBRN threat focusing the basic elements to develop future strategies for an integrated plan of actions for natural, anthropic and CBRNe crisis and emergency management.

Key Words/Phrases: natural risk, CBRNe, terrorism, crisis, emergency, risk management

39. DOCTRINE OF CBRNe DEFENCE: CIVIL DEFENCE, DEFENCE SUPPORT TO CIVIL AUTHORITIES

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CBRN risk is given by the spread of biological agents, hazardous chemicals, ionizing radiation or radioactive substances that would product, in a certain place, a contamination threat to humans and environment. Whatever is its origin, intentional like war and terrorist

attack or accidental like natural and incidental origin, the final results are negative effects on the whole territory. At international level, from the last century, the dimension of CBRN threat is increased due to the combination of an increasing production, manipulation, use and transport of chemical, biological and radiological/nuclear materials and an increasing availability of technology, expertise competences and substances. To address the evolution of this threat we need a strong activity of the Civil Defense system in supporting the authorities for preparedness, response and mitigation in case of natural, accidental or intentional CBRNe and in managing a complex system, composed by a lot of different entities, resources and tools. For that this paper wants to explore the territorial protection system against unconventional threat focusing the attention on the Civil Defense structure and organization and underlining the system criticality and the corrective actions to carry out to achieve an integrated and effective response system in supporting the National Authorities during CBRN crisis or emergencies.

Key Words/Phrases: civil defence, CBRNe, crisis, emergency



Prof. Roberto Mugavero – Degree in Environmental Engineering at the University of Rome "Tor Vergata", Professor of "Action Planning for Homeland Security" at the University of Rome "Tor Vergata"- Faculty of Engineering, Scientific Coordinator of Master of Science "Protection from CBRN Events" at the University of Rome "Tor Vergata". Prof. Mugavero is president of the "Observatory on Security and CBRNe Defence".

Professor in several Fire Prevention, Security and Safety Courses and Conferences Speaker in the fields of Security, Safety, CBRN Risk, Emergency Management, Risk Management, Crime Prevention and Technological-Industrial Risk. National CBRN Defense Expert and Italian Representative, as "Coordination Expert CBRN," in the European Civil Protection Task Force. Board Member at the Ministry of the Interior and at the Presidency of the Council of Ministers – National Department of Civil Protection. Volunteer Firefighter Officer, Rank Colonel, at Rome Fire Brigade. Board Member at ISPRO Institute – Italian Institute for Studies and Research on Security, Civil Protection and Defense. He also collaborates with several Organizations, Associations, Magazines and Industry in the field of Security and Safety. He has participated in many national and international exercises and emergency activities.

40. THE CBRN PRE-HOSPITAL RESPONSE IN LOMBARDY: EVOLUTION AND SUSTAINABILITY

Dr. Francesco Foti

Inf. E. Albergoni

Dr. C. Cozzi

Dr. M. Salmoiraghi

Dr. M. Landriscina

Pre-Hospital Emergency Company (AREU)

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Milan

Italy

Lombardy is an industrial region in north of Italy and Milan is the main town. In 1976 the people of a small town closed to Milan (Seveso) was affected by one of the most important chemical disaster in the Italian history.

After 9-11-2001 the National Civil Protection defined new guidelines to face decontaminated event and EMS systems started specified training on using field decontamination units, integrating and supporting the Fire Brigade response in CBRN events out of the hot zone. After 12 years analysis, AREU (since 2009 the company that manages and coordinates all of the pre-hospital EMS response) concluded that it was an expensive and not sustainable system.

A new model to face no-conventional events was defined, based on 3 level of EMS response.

Level 1: 100 EMS physicians and nurses trained to perform decontamination in and out from a field unit. They are specified trained on mass decontamination or hospital decontamination support.

Level 2: 1500 EMS physicians and nurses trained on single and controlled decontaminations; they assure to remove clothes, to reduce toxic effects, and start a first basic and an advanced medical support before transport (deco, play and run).

Level 3: based on EMT rescuers with PPI, dedicated to transport "cleaned" and stabilized casualties.

Training courses are residential for Level 1 and on web platform for Level 2 and 3.

Key Words/Phrases: AREU, EMS decontamination response, sustainability



Dr. Francesco Foti – Medical Doctor Anesthesia and ICU, Medical Doctor at Anesthesia and ICU at Gravedona Hospital (Lombardy), between 1986 until 1988, Medical Doctor at the II Service Anesthesia and ICU at "S. Anna" Hospital in Como (Lombardy), since 1988 until 2009, Pre-hospital care on helicopter medical service, since 1988 until 2010, Member of the Regional

Mountain Rescue Doctors Committee, since 1999 until 2011, Coordinator on Disaster Medicine training programs for medical and nurse personnel, since 2003 until 2011, at a local level, Training programs at the European Center on Disaster Medicine (CEMEC), between 1989 until 2003, Training programs at the "Centro di Cultura Scientifica A.Volta- Como" concerning Disaster Medicine and MCI Management, since 2004 until 2011, Training programs for volunteers (Red Cross, Civil Protection, others agencies) in Como Province, Training programs in Disaster Medicine for Bicocca University 1st Level Master (Monza), between 2002 until 2011, Member of the EMDM Alumni, since 2006 until 2013, 2007-2008: coordinator of a doctors and nurses training project for UNDP in the Southern Province (Galle city), Sri Lanka, called ART-GOLD SRY LANKA, Coordinator of the Lombardy Rescue Disaster Response after L'Aquila Heartquake (2009), Coordinator of the regional committee (Lombardy Region) on MCI and Disaster Medicine management, since 2006 until 2009.

41. BIOSAFETY AT THE RICHARD G LUGAR CENTER FOR PUBLIC HEALTH RESEARCH (CPHR), TBILISI, GEORGIA

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Biosafety Officer and Occupational Health Person
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The CPHR is the first BSL2/BSL3 (biosafety level 2/3) laboratory in the Trans-Caucasus region. It was built and is now functioning with US Government support in collaboration with the Georgian Government as part of a disease surveillance and public health research program. After overcoming a number of obstacles during its early stages of development -not uncommon for high containment laboratories – the laboratory is now in a validation phase, which is being conducted by US contractors. In a national environment which is still addressing legal issues regarding the implementation of biosafety, and which has scientists who are still becoming familiar with biosafety, the Georgian CPHR laboratory is one of the leading regional research organizations that is conducting an active program for maintaining safe laboratory conditions through risk assessment and parallel trainings for developing knowledge and practical skills for biosafety and biosecurity.

The CPHR has a unique regional capability to perform high-quality research in both human and animal health. First, the building and its instruments and equipment are fully consistent with state-of-art requirements for biosafety. Second, particular importance is being given to biosafety administrative control policy in the laboratory, focusing on the creation of documentation (Standard Operating Procedures or SOPs) and regulations in which modern experience and accumulated knowledge have been adapted and adjusted to the national reality.

All this is carried out in partnership with very experienced and well-known organizations managing high containment biological laboratories, such as the Walter Reed Army Institute of Research (WRAIR) and Battelle Memorial Institute, which really increases CPHR capabilities. An international group of leading biosafety and biosecurity specialists are participating in the work of our laboratory. Our background and experience provide a good example for those countries that are trying to implement modern biosafety standards in public health and science, and meanwhile want to be equally relevant to both national and international regulations. Also, the CPHR can serve as an excellent base for future training sessions to increase the level of biosafety in the region.

Key Words/Phrases: Caucasus region, Biosafety training, Biosafety & biosecurity, Biosafety management

42. NON-TRADITIONAL APPROACH TO BACTERIA KILLING: SILVER NANOPARTICLES

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Aleksei Safonov
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Widespread use of antibiotics has led to the emergence of multidrug-resistant (MDR) microorganisms, and sharply raised problem of development of new antibacterial drugs.

Antimicrobial effect of silver has been known since ancient times, and the use of drugs based on silver nanoparticles (SNPs) seems promising approach for killing of MDR-bacteria. The aim of this study was to examine the interaction of SNPs with Gram-negative *Salmonella typhimurium* and Gram-positive *Staphylococcus aureus*.

The SNPs were prepared by a gas-jet method and were in nature a nanocomposite of metal silver and fluoropolymer matrix (a derivative of tetrafluoroethylene).

The SNPs were deposited on sterile medical bandage with silver concentration 0.0125 mg /l on 1 cm². *S. typhimurium* and *S. aureus* (4x10⁸ CFU/ml) were incubated with 4 cm² of the bandage in shaker during 30, 60, 90 min., 2, 5 and 23 h.

The samples were examined for survival of bacteria and prepared for electron microscopy. Stability of SNPs coating on bandage also was examined.

SNPs showed evident bactericidal effect on both *S. typhimurium* and *S. aureus* (90% and 50% of bacteria, correspondingly, were killed after 2 h). Electron microscopy of ultrathin sections found entry of SNPs into bacteria cells and revealed different mechanisms of bacteria alteration by SNPs.

Plasma membrane was main target for SNPs in both microbes, however cell wall of *S. aureus* appeared more secure than double membrane envelope of *S. typhimurium*. Our study showed that SNPs deposited on medical bandage represent effective antimicrobial preparation.

Key Words/Phrases: silver nanoparticles, mechanisms of antimicrobial effect

43. PATHWAYS OF GOLD NANOPARTICLES INTERNALIZATION BY THE SAME CELLS IN VITRO AND IN VIVO

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Nanoscale gold particles (GNPs) show great potential as imaging, drug delivery and photothermal therapy agents. The applications propose contact of GNPs with living cells, and ask for knowledge of mechanisms of their interactions with cells. Our work was aimed at the examination of pathways of GNPs entry into the same cells in vitro and in vivo.

Hepatoma A1 (Hep-A1) cells (tumor), and peritoneal macrophages ("normal" cells) were treated in vitro by 104 GNPs/ml during 0, 10, 20, 30, 60 min, 2, 5 and 24 h. The same cells were treated by GNPs directly in mice peritoneal cavity, and cells were sampled at 10, 20, 30, 60 min. and 2, 3, 5 and 24 h after GNPs injection, fixed and examined by transmission electron microscopy. Both cell types readily internalized GNPs however the pathways of uptake differed. In vivo Hep-A1 cells trapped GNPs by macropinocytosis, phagocytosis and raft-dependent endocytosis, while macrophages showed phagocytosis and clathrin-dependent endocytosis. All cells kept GNPs inside endosomes and lysosomes, no entry of GNPs into cytoplasm and nucleus was detected. The most active uptake of GNPs was observed in vivo in both cell types.

In vitro Hep-A1 cells showed the same pattern of GNPs internalization; however total amount of the particles engulfed by cells was reduced in comparison with in vivo study. Macrophages kept high uptake of GNPs in vitro. Thus, different cell types possess different internalization pathways of GNPs; however pathways were identical for the same cells in vitro and in vivo. These data should be taken in account in biomedical researches and particularly in development of drug-delivery systems.

Key Words/Phrases: gold nanoparticles, hepatoma A1 cells and peritoneal macrophages, pathways of gold nanoparticles internalization, in vivo and in vitro



Prof. Elena Ryabchikova was graduated in 1974 from Novosibirsk State University. PhD degree was obtained in 1980 at Moscow State University in Anatomy, Embryology and Histology. Dr. Science degree was obtained in 1998 at State Research Center of Virology and Biotechnology "Vector", in Virology, Histology and Cytology. She is Professor of Virology from 2005. Prof. Elena Ryabchikova is Senior

Researcher at Institute of Chemical Biology and Fundamental

Medicine of Russian Academy of Sciences. Current work: mechanisms of nanoparticles interaction with a cell; development of antitumor drugs based on targeted effect of tumor cell genome. PUBLICATIONS: totally more than 200.

44. NOVEL MECHANISMS IN THE PATHOGENESIS OF LATE MUSTARD TOXICITY

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Sulfur Mustard (SM), also known as mustard gas, has been most widely used chemical weapon. The toxicity of SM as an incapacitating agent is much greater importance than its ability to cause lethality. After several decades of studies, the acute toxicity of SM has been revealed as nitro-oxidative stress, DNA alkylation, energy depletion and a consequent robust inflammation with in the affected tissues. Therefore, several antioxidant compounds and anti-inflammatory drugs have been shown beneficial effects on acute toxicity. The delayed toxicity of SM however, has still no mechanistic explanation. Victims of Iran-Iraq war (1981-1989) have been still suffering from late toxic effects of SM exposure including ophthalmic, cutaneous and respiratory sequels. Among them, respiratory disorders are the most frequent and disabling consequences. In spite of the vigorous treatment modalities, physicians have failed to treat late toxic effects of SM exposure although it mimics chronic obstructive pulmonary disease (COPD). Because of the abovementioned reason (i.e., failure to treat with antioxidants and/or anti-inflammatory drugs including both steroids and NSAID) SM-induced lung toxicity has been coined as "mustard lung". The inability to treat chronic toxicity of SM with conventional treatment modalities let us to reconsider about the pathophysiological mechanism of this chemical weapon. According to our experimental results SM seems to be harmful not only for protein coding genes, but also regulatory part of the DNA, therefore is considered as an "epigenetic disruptor". The word "epigenetic" explains reversible heritable changes in gene expression that occurred without alteration in the DNA sequence, but changes that were sufficiently powerful to regulate the dynamics of gene expression. The traditional view that gene and environment interactions control disease susceptibility can therefore, be expanded to include epigenetic reprogramming as a key determinant of origins of several human disease. The "mustard lung" seems presumably as a consequence of epigenetically disrupted cells following SM exposure. By this way, an epigenetic look at the affected tissues may be a novel hope in the treatment of late toxicity of such an enigmatic chemical weapon.



Dr. Ahmet Korkmaz Graduated from Gulhane Military Medical School at 1993 and got his Ph.D. degree at 1998 from the department of physiology at the same medical school. He was promoted to associated professor at 2005 and full professor at 2011. He worked as a visiting professor at University of Texas Health Science Center at San Antonio for two years. His research interests are the

mechanism of mustard toxicity and bio-oxidative treatment modalities. He has conducted more than 40 national and 3 international projects during the 1999-2012 periods. His laboratory is also focused on anti-oxidative and anti-nitrosative efficacy of melatonin in several experimental models. Recently, the lab has an emerging interest in the involvement of epigenetic mechanisms in human diseases.

45. REACTIVATION KINETICS FOR ORGANOPHOSPHATE INHIBITED ACETYLCHOLINESTERASES: AN UPDATE

Rahul Sharma

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Research and development in the area of novel and universal acetylcholinesterase (AChE) reactivators have attracted considerable interest owing to their potential role in the toxicology, neurochemistry and pharmacology. The broader use of neurotoxic organophosphate compounds (OP) as chemical warfare agents, pesticides and insecticides in agriculture, has to be considered as real threat to the world population.

The therapeutic approach of OP intoxication is to reactivate the inhibited AChE using strong nucleophiles as oximes. Our group, over the past several years has been engaged in developing effective strategies to study the reactivation kinetics of conventional and novel oximes with organophosphorus inhibited enzymes in collaboration with Dr. Kamil Kuca group (Czech Republic).

This presentation is aimed at underlying the principles, structure reactivity correlations, and reactivation kinetics of paraoxon(ethyl) inhibited electric eel acetylcholinesterase with a series of mono- and bis-pyridinium oximes. The ionization constant of oxime groups and lipophilicity of reactivators have also been studied both experimentally and theoretically using structure based computational analysis.

The results of this study give insight into structural requirements for the development of a next generation broad spectrum oxime reactivators. The present global status, future activities and challenges and overview on the advances in this important area of research will be illustrated.

Acknowledgement: The financial support from Defence Research Development Organization, New Delhi, Govt. Of India (Project No: ERIP / ER / 1003906 / M / 01 / 1393) is gratefully acknowledged.

Key Words/Phrases: Reactivation kinetics, Oximes, Acetylcholinesterase, Paraoxon



Rahul Sharma – 2009 M.Sc Jiwaji University Gwalior, Organic Chemistry. Projects: Synthesis of biologically active molecules from carbohydrate based ligands for potential application in defence" funded by Ministry of Defence, Govt. of India. Synthesis and development of novel oxime reactivators of cholinesterase inhibited by organophosphate toxicants" funded by Ministry of

Defence, Govt. of India.

46. TURKISH DOMESTIC MEDICAL PREPAREDNESS FOR CHEMICAL DEFENCE BASED ON RECENT THREATS

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The recent and currently on-going threat has reportedly been on the agenda of Turkey for the possible use of chemical weapons (CW). By taking the existing environmental, socioeconomic and demographic situation into consideration, southern region of the country would be the most likely center of any attack due to CW, mainly sarin, Vx and mustard. An incident of CW use would be a high-consequence event that might potentially generate hundreds of casualties requiring prompt medical care. So, medical management of incidents involving chemical warfare agents is critical to reducing morbidity and mortality. From this perspective of threat, our both civilian and military health authorities took necessary measures to strengthen the early recognition and response system.

The level of awareness of medical care providers was augmented by means of training, seminars and panels on hospital and prehospital management of CW casualties outlining the practical actions and clinical priorities.

Based on risky regions, PPE along with the medical equipment including antidotes, drugs, decon materials were provided and planning and coordination for the effective use of materials and personnel was documented. Within this plan, in-hospital and prehospital decon facilities and shower system was elaborated.

Since timely detection and identification of the agent is critical to protect the population, detectors and

mobile chemical analytical laboratory was given into use by especially units located in mentioned region. Consequently, this paper aims to give a summary of the defensive actions done by the health units to be better prepared against CW threat emerged recently.

Key Words/Phrases: Chemical Weapon, Threat, Medical Management, Turkey, Training



Dr. Levent Kenar has been working for 15 years in the Department of Medical CBRN Defence of Gülhane Military Medical Academy and he is currently assigned as Associate Professor as an Medical CBRN specialist in this department. He is responsible for all the issues held in the department including making scientific studies, giving lectures about the medical aspect of chem-

bio weapons to medical and nonmedical staff, performing analysis regarding to the determination of agents. He worked as doctoral student in the doctorate program about medical aspect of CBRN agents between 1997-2002. since he was also leading the medical CBRN medical response team established under the authority of Medical Academy, He has tasked in prompt and effective response to incidents and supervised the medical staff in the team including physicians, nurses and paramedics. From the medical aspect of chemical defense, he has also tasked in various international organisations and has represented Turkey in CBRN-NATO related groups like CBRN Medical Working Group, CBRN Defense Working Group, NBC Initiatives in NATO Assessment Team. He has also certified as the inspector of UNMOVIC organized by the United Nations. He worked as a visiting scholar in University of Minnesota between Sept 2010-Sept 2011. He has 37 scientific papers published in SCI and SCI-E and 55 presentations in international scientific meetings. He is married and father of two daughters.

47. SULFUR MUSTARD EXPOSURE AND MENTAL HEALTH IN SURVIVORS OF THE IRAN-IRAQ WAR WITH SEVERE LUNG INJURIES

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The aim of the study was to evaluate psychological health status of the survivors of Iran-Iraq war with sulfur mustard (SM) induced severe lung injuries. This survey was conducted after more than two decades of SM exposure in 292 Iranian survivors. Iranian standardized Symptom Check List 90-Revised (SCL90-R) questionnaire was used to assess the survivors' psychological health status. The Global Severity Index (GSI) was compared with the optimal cut-off point of Iranian general population. Data were analyzed using SPSS software. The mean age of survivors was 45.9 (SD=7.6). Most of the cases 94.9% (n=277) were

married. One-third of the cases 38.1% (n=88) were exposed to MG more than once. Additional war related injury was observed in 89.4% (n= 261). One third 32.9% (N=96) had a positive history of previous psychological problems. The mean GSI (1.74 ± 0.74) of the study group was higher compared to standardized cut off point of the Iranian community (0.4). The highest means were observed for somatization (2.36 ± 0.74), obsessive compulsive (1.94 ± 0.85), depression (1.8 ± 0.88) and anxiety (1.87 ± 0.94). Co-morbidity was significantly more associated with higher means of anxiety, obsessive compulsive and hostility ($p < 0.05$). In addition positive psychological history was significantly associated with higher means of GSI and all SCL-90 domains ($p < 0.001$). Severe lung complications in chemical warfare victims are accompanied with destructive effects on mental health condition.

Key Words/Phrases: Sulfur mustard, Psychological status, lung complication, War survivors



Dr. Batool Mousavi, MD, MPH, Specialist in community and preventive medicine, Head of the Prevention Department Janbazan Medical & Engineering Research Center – JMERC. Responsible for evaluating and improving health related quality of life in war survivors. PI -principle investigator- of The National Health Monitoring Program of war related bilateral lower limb amputation. Researcher

in the National Health Monitoring Program of CW Survivors. Researcher in The National Health Monitoring Program of Post war Landmines Injuries in children under 18.

48. EMERGENCE OF A NEW ANTIBIOTIC RESISTANCE MECHANISM – NDM-1 METALLO-BETA-LACTAMASE IN E. COLI CLINICAL ISOLATES IN A HOSPITAL IN BULGARIA

Prof. Encho Savov

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A novel enzyme, described during 2008 – NDM-1 (New Delhi Metallo b-Lactamase 1), which encoded by blaNDM-1 gene, is increasingly dominant. Twenty multidrug-resistant clinical Enterobacteriaceae strains, isolated in a 7-month period (February to August, 2012) at Military Medical Academy in Sofia, Bulgaria, were investigated and eleven of them were positive for NDM-1 production. It is the first report on the NDM-1 carbapenemase detection in Bulgaria, confirmed by Real Time PCR. Only two classes of antibiotics – polymyxins (colistin) and glycolcyclines (tigecycline) have shown in vitro activity against NDM – 1 harboring Enterobacteriaceae strains investigated. It is very important to note that our positive for NDM-

1 production strains, together with those, isolated in Croatia, Kosovo, Serbia, Bosnia and Herzegovina, Montenegro suggested that Balkan region is probably other area of endemicity of these problematic for hospital pathology microorganisms in addition to Indian subcontinent.



Prof. Encho Savov is Head of Department of Military epidemiology and hygiene and Head of laboratory of microbiology in Military Medical Academy, Sofia, Bulgaria. Application of new genetically methods for diagnosis and epidemiological typing, bacterial resistance to antimicrobial drugs. Publications: About 180 scientific papers.

49. ANTIMICROBIAL ACTIVITY OF PENTACYCLIC TRITERPENES ISOLATED FROM ACACIA GENUS

Joyce Ondichoa

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Acacia mellifera (Leguminosae) is a subtropical medicinal plant that is widely used in traditional African medicines against various diseases. Bioassay-guided extractions of *Acacia mellifera* stem bark have shown that antimicrobial activity is concentrated in the triterpenoid fraction. Further fractionation of this extract has yielded three triterpenoids; (20S)-oxolupane-30-al, (20R)-oxolupane-30-al, and betulinic acid. The structure elucidation of the isolated compounds was based primarily on 1D and 2D NMR analyses, including HMQC, HMBC, and NOESY correlations. The biological screening of (20S)-oxolupane-30-al revealed potent antibacterial and antifungal activities. (20R)-oxolupane-30-al and betulinic acid showed antibacterial activities only. These results may partly explain and support the use of *Acacia mellifera* stem barks for the treatment of infectious diseases in traditional Kenya medicine.



Joyce Manoti Ondicho – Current research activities: Bioassay guided fractionation of efficacious plant extracts to obtain anti-malarial and antibacterial compounds. Antimalarial and antibacterial bioassay of medicinal plants and their safety studies in vitro & in vivo. Research interests – Main research interest is anti-parasitic efficacy & safety investigation of plant extracts and compounds against i.e. malaria

parasites in vivo & in vitro. Isolating pure compounds from the natural sources using current chromatographic techniques, and application to development of naturally occurring medicine.

50. POTENTIAL ENVIRONMENTAL RISKS OF NANOPHOTOCATALYSTS APPLICATIONS AND THEIR PREVENTION

Prof. Rashid Khaydarov

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Nanophotocatalysts (NPC) active under visible light have been extensively investigated by many research groups and have found applications in various areas of science and technology.

We have developed recently special nanocarbon-metal oxide nanocomposites which can be considered as a new type of NPC. They can potentially be used 1) for destruction of chloroorganic substances and bacteria in soil and in the water of ponds and lakes; 2) for destruction of VOC in the atmosphere, etc.

The main advantage of NPC is their low consumption to destruct organic substances and bacteria: 2.5 g/hectare of lake, 50 mg per 100 m² of ground surface and 1000 m³ of air during 0.25 – 8 hours. In the present paper we demonstrate that on the other hand the colloidal solutions with high concentration of NPC (more than 1 g/l) can pose serious hazard to the environment due to the quick destruction of all organic materials (grass, leaves, clothes, polymeric items and paints).

For hazard assessment of nanophotocatalysts it should be noted that generally NPC do not have smell, their colloidal solutions are transparent and colorless, moreover the technology of NPC synthesis is rather simple. Some methods of detection and destruction of NPC in soil, water and air have been described in the paper.

Key Words/Phrases: Hazards, Nanotechnology, Nanophotocatalyst, Risk



Professor Rashid Khaydarov has more than 40 years of experience in teaching and research in the field of Material Sciences. He is currently Professor and Head of the Department of Scientific Devices at Institute of Nuclear Physics in Tashkent, Uzbekistan. Much of his research has been in the study of activation analysis on cyclotron and atomic reactor for metallurgy, chemical defense, and water treatment. Since 2000 he has been working in the field of synthesis of nanostructured materials for technological applications. Professor Khaydarov has authored over 250 research papers in such fields as material sciences, chemical defense, nanoscience and nanotechnology, etc. Some materials and devices developed by him are currently used by private companies and research organizations in USA, England, Germany, South Korea, Russia and Uzbekistan.

51. SAFE CLINICAL APPLICATIONS OF THE BIOLOGICAL HALF-TIME DECORPORATION OF URANIUM BASED ON PRECLINICAL INVESTIGATIONS

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The fundamental research methodology of the decontaminant and restorative effect of the new patented pharmaceutical product STANOSIMAGNE for in vivo radiobiological decontamination of uranium (^{235}U), based on rad-bio-chemical determinations and analysis of the specific pharmacokinetic activity, performed on 635 laboratory animals proving the absence of any toxicity, conducted to the final non-clinical (preclinical) cumulated experimental results for the in vivo biological half-Time decorporation of uranium $\text{Tb1}/2\text{U}=8\text{days}$, in safe conditions, as certain and evident.

The practical pharmacology studies and experiments have been carried out along with the medical, pharmacological and biochemical didactic professionals coming from the Departments and Laboratories of Pharmacology, Phytochemistry, Biochemistry, Chemistry and Pharmaceutical Technique of the Medicine and Pharmacy University "Carol Davila" Bucharest. The safety of the experimental results offered the certainty to extend the pilot clinical studies to human professional, accidental or hazardous overexposure cases, including the effects of the CBRN threats and terrorism.

The clinical applications of the new method of the biological half-Time decorporation of uranium radionuclides is based on the similarity and particularity of the physic-chemical properties of the radio-toxic uranium as heavy metal and other chemo-toxic contaminant elements or substances. The STANOSIMAGNE treatment of heavy metal lesions of mercury (Hg), lead (Pb), cadmium (Cd), arsenic (As), barium (Ba) and technetium (Tc) is discussed. The clinical investigations, and administration of the decontaminating treatment to the persons exposed to irradiation or heavy metals contamination, in risk areas, are based on the continuation of the pilot clinical studies on several cases, which could not be solved by regular medical methods and treatments, and they are in accordance with the Directive 2001/20/CE of the Europe Union Parliament.

Key Words/Phrases: Biological half-Time of Uranium (^{235}U), Heavy Metal Lesions of Mercury (Hg), Lead (Pb), Cadmium (Cd), Arsenic (As), Barium (Ba) and Technetium (Tc)



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Constantin STAN is PhD in
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Bucharest. In 30 years of scientific
research and documentation, he has

obtained evident and certain results regarding the biophysical and biochemical mechanism of in vivo decorporation of radiotoxic uranium, heavy metals and others noxious chemicals. Starting with 1995, the author, as project manager, initiated, directed and developed the scientific research of the pharmaceutical product for the treatment of rad-bio-chem lesions induced by direct contamination. In 1996 Col STAN patented the biologically active composition of the pharmaceutical product with high and efficient role in radiobiochemical decontamination of radio-toxic uranium ^{235}U and heavy metals.

52. FROM OKUNOSHIM ISLAND TO MAJNOON ISLAND (CHRONIC-LOW DOSE VS SINGLE-HIGH DOSE EXPOSURE TO SULFUR MUSTARD, A COMPARATIVE CLINICAL EVALUATION)

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Over 16 years between 1929 and 1945, poison gas for chemical weapons was manufactured at the chemical facility of Japanese army in "Okunoshima", a tiny Island near Hiroshima. From 1954, an official medical care system was instituted for those who had worked in the manufacture, transport and disposal of gas at this facility, who had suffered health problems as a result.

From 1983 to 1988 large scale chemical weapons attacks took place in the war between Iran and Iraq which resulted in death of several thousands. Over 100.000 civilians and soldiers who survived the gas attacks sustained lingering health effects in the years after the war and majority of them are still under health monitoring program by Janbazan (war survivors) organization.

The heaviest gas attacks took place in the "Majnoon" Island, a strategic oil rich battle zone in the southern part of Iran-Iraq border.

In the present study we compared the clinical evaluation of Iranian veterans with wartime single, high-dose exposure to sulfur mustard during 80s and the Japanese former workers of Okonajima facilities with chronic low-dose exposure to sulfur mustard.

Key Words/Phrases: sulfur mustard, low-dose exposure, High-dose exposure, chemical warfare



Shahriar Khateri, MD – PI in several research project addressing the health effects of exposure to CW Member of emergency medical team in ASSISTEX I & II (OPCW exercises). Co-founder of the Society for Chemical Weapons Victims Support SCWVS, an NGO to help CW survivors in Iran. Author of several articles and scientific publication regarding the health and environmental impacts of CW.

53. BIOSAFETY PROGRAM FOR HUMAN & VETERINARY LABORATORIES IN GEORGIA

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The Republic of Georgia, with support from the US Defense Threat Reduction Agency, has built a network of laboratories for the detection and surveillance of human and animal infectious diseases associated with Especially Dangerous Pathogens (EDP). This requires management of numerous biosafety and biosecurity (BS&S) risks and involves implementing a BS&S program that is based on international standards and best practices. Program implementation was achieved through training, mentoring, risk assessments, and upgrades and improvements to facilities and practices. BS&S training included development of unique methods of instruction since lab personnel exhibited a wide range of skills, experience, and knowledge. An interactive style of training was used that challenged the staff to implement what they learned and showed areas where more training was needed. A mentoring program for biosafety officers and laboratory staff was established that included much on-the-job assistance and the conduct of workshops and symposiums. Facility and operational risk assessments were done using focused BS&S Lab Assessment Checklists and reports. Completion of laboratory upgrades and improvements to existing work practices has occurred in the form of dedicated sample receiving windows at two zonal laboratories, TB work stations, instituting a respiratory protection program, and new SOPs. This combination of assessment, training, mentoring, and hands-on approach has allowed for practical implementation and sustainment of good biosafety and biosecurity practices throughout the Georgian laboratory network. This can be a good model for other low-resource countries to follow as they implement their biosafety and biosecurity programs.

Key Words/Phrases: Biosafety training, Biosafety & biosecurity, Biorisk management

54. IMPACT PROFILING OF CHEMICAL, BIOLOGICAL, NUCLEAR AND RADIOLOGICAL INCIDENTS

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CBRN incidents, both caused accidentally by human error or natural/technological events and determined intentionally as criminal/malicious/terroristic acts, have consequences that could be differently characterized. This paper aims at studying macro-level impact profiles of incidents caused by weaponized and non-weaponized materials in the four cases: Chemical, Biological, Radiological and Nuclear. Effects are investigated according to two main dimensions: type of large-scale effect and persistence of effect. Each case is classified according to 3 types of large-scale effects: economic impact (in terms of damages to other productive infrastructures), public impact (in terms of changes in social confidence) and casualties (as injuries and fatalities). Furthermore, Chemical, Biological, Radiological and Nuclear incident impacts are analyzed taking into account persistence of effect during time as short-term impact (i.e. immediately after the incident) medium-term impact (i.e. by a month) and long-term impact (i.e. by a year). Key features of past CBRN incidents are used to build impact profiles. Consequence management and effect mitigation of CBRN emergencies and disasters may benefit from an ex-ante definition of the impact profiling related to these incidents. The main goal of this paper is to provide an information base able to make more effective and efficient first responders' prompt actions and policy makers' strategic decisions.

Key Words/Phrases: CBRN incidents, impact profiles, persistence, social-economic effects, casualties



Simona Cavallini is currently director at FORMIT Foundation, Responsible of the Research and Innovation area. Prior to joining FORMIT Foundation, she built her research competences through a master in economics and through experience in several academic and research institutions, among others the University of Eastern Piedmont and the University La Sapienza of Rome. During the past few years at

FORMIT, she has managed different EU projects and contributed as senior researcher within the field of economics of security and in particular on relevance of interdependencies between infrastructures, on effects of critical infrastructure failures, on importance of information sharing, on analysis of optimal security investments and on definition of security policies. On these topics, she is author of publications at the international level. Currently she is also Delegate for Research of the Board of the LUSPIO University (Rome) and member of several institutional working groups in the security and resilience area, among others EP3R (European Public-Private Partnership for resilience) Working Group coordinated by the European Commission and WGs on Economics of Security of the ENISA.

55. IN VITRO OXIME-ASSISTED REACTIVATION OF HUMAN BUTYRYLCHOLINESTERASE – DEVELOPMENT OF POTENTIAL PROPHYLAXIS FOR NERVE AGENT INTOXICATIONS

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Bioscavengers are able to neutralize organophosphorus inhibitors (OPI; nerve agents and organophosphates) in the bloodstream before they can reach their natural target-cholinesterases. The antidotal efficacy of administered butyryl cholinesterase (BChE; EC 3.1.1.8) could be further increased by its combination with oxime with sufficient reactivation potency, where the catalytic activity of cholinesterase inhibited by OPI could be continuously renewed (pseudo catalytic bioscavenger). For these purposes we have evaluated in vitro ability of several new reactivators to reactivate sarin, tabun and VX-inhibited human BChE. We identified several promising oximes able to sufficiently reactivate BChE inhibited with tested OPIs, which could be potentially used for the formulation of pseudo catalytic bioscavenger. Acknowledgement: This work was supported by a long-term organization development plan 1011.

Key Words/Phrases: Bioscavengers, Nerve Agents, Butyrylcholinesterase, Organophosphates, Oxime Reactivators



Daniel Jun – 1995-2001 – Master degree (MSc.) in pharmacy – Charles University in Prague, Faculty of Pharmacy in Hradec Kralove and Faculty of Military Health Sciences, University of Defence (former Purkyne Military Medical Academy), Hradec Kralove. 2001-2005 – Ph.D. degree in toxicology – Faculty of Military Health Sciences, University of Defence. 2003-Aug. 2006 –

Research and development worker – Department of Toxicology, Faculty of Military Health Sciences, University of Defence, Hradec Kralove. From Sept. 2006 – Academic worker, head of the Chemical Section – Center of Advanced Studies, Faculty of Military Health Sciences, University of Defence, Hradec Kralove. 2007 – PharmDr. (Pharmaciae doctor) – Charles University in Prague, Faculty of Pharmacy in Hradec Kralove. 2012 – Associate Professor of Toxicology – Faculty of Military Health Sciences, University of Defence.

56. AUTONOMIC MONITORING OF METRO STATIONS FOR HAZARDOUS SUBSTANCES

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The mobility of the global population is constantly growing. In terms of regional passenger traffic the public transportation is very important. But, public places like metro stations are critical infrastructures and hence often targets of terroristic attacks. In 1995 for example the Tokyo subway was attacked by sarin – a weapon of mass destruction. The released nerve gas killed 13 people and injured more than 1000. Due to the fatal damage and high toxicity of chemical warfare agents (CWAs) a reliable, sensitive and fast monitoring technique is required.

Ion mobility spectrometry (IMS) is an analytical technique which can be used for detection of hazardous substances in the gas phase down to the ppb (parts per billion) range. Due to its high sensitivity towards organophosphorous and halogenated compounds IMS is ideally suited for detection of a large number of CWAs such as sarin, soman, tabun and VX. The autonomic working Rapid Alarm Identification Device Automated Facility Monitor (RAID AFM) is a chemical detector based on IMS technology which meets the challenging security requirements for the protection of critical infrastructures. It was installed at different metro stations to monitor the gas phase for toxic nerve, blister, blood and choking agents. Compounds such as sarin (nerve agent), mustard (blister agent), cyano related compounds (blood agent) and phosgene (choking agent) were detectable at low $\mu\text{g m}^{-3}$. In addition, a diverse number of toxic industrial chemicals (TICs) can be detected simultaneously as well. TICs are widely used in industrial processes and therefore are much more easily accessible for terrorists but not less dangerous.

57. IMPROVING FORENSIC CAPABILITIES

Dr. Marc Cadisch

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One of Switzerland's priorities in arms control and disarmament policy for the coming years is the strengthening of its forensic capabilities, primarily in the nuclear field. Once trafficked nuclear material has been intercepted, questions of its origin are of prime importance in order to close security-gaps and improve protection at the sites where the theft or diversion occurred. To deal with such problems, SPIEZ LABORATORY – the Swiss Federal Institute for NBC Protection – will expand its nuclear forensic capabilities accordingly. In the chemical field, additional capabilities should be pursued, in order to

improve the attribution of a toxic chemical or precursor to a particular source or production route. Approaches include the identification of certain impurities, statistical comparison of complex GC-MS chromatograms, and isotope ratio MS. For this type of forensic chemical work, extensive collaboration between institutions and laboratories is required.

Key Words/Phrases: Forensics



Dr. Marc Cadisch, Director SPIEZ LABORATORY – Dr. Marc Cadisch was born in 1962 in Thun, Switzerland. Following his pharmaceutical studies in Bern he pursued his scientific studies with a doctoral thesis in organic chemistry at the Swiss Federal Institute of Technology Zurich, Switzerland. Dr. Cadisch then worked in various areas of pharmaceutical industry. Parallel to his professional career he

successfully completed further post-graduate studies in business management at the University of St. Gallen obtaining an Executive MBA HSG in January 2003. Dr. Cadisch joined SPIEZ LABORATORY, the Swiss Federal Institute for NBC Protection, in December 2002 and on 1 April 2003 he assumed the position as director of SPIEZ LABORATORY. He is in the Foundation Board and Honorary Member of the Swiss Society of Industrial Pharmacists and Vice President of the Swiss Federal Commission for NBC Protection. He lives in Thun, he is married and the father of three children.

58. DEGREE OF IMPERMEABILITY OF MILITARY PROTECTIVE FABRICS TO HAZARD SUBSTANCES

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The impermeability to permeation and penetration is a crucial acquirement for the use of textile materials for protective clothing in general. The level of penetration of a hazard substance into military protective material made of 50 % cotton and 50% polyamide fabrics was evaluated by using sulfuric acid as a test liquid. For this purpose diluted (0.1 M) and concentrated (98 %) H₂SO₄ as well as the protective fabric containing two different amounts of humidity were chosen for the examination. The effects of the corrosive liquids in destroying and rebuilding bonds in the both substances that make up the fabric were evaluated by FTIR spectroscopic measurements. The performance of both components of the composite fabrics in

contact of the test liquids was taken into consideration for evaluating the role of the less resistant component, cotton, in emphasizing the good performance of the fabric under observation. Also, water repellency, waterproofness and vapor permeation were measured.

Key Words/Phrases: protective clothing, hazard substances, FTIR spectroscopy

59. EXPERIENCE IN TREATMENT OF CONTAMINATED SOIL USING THERMAL DESORPTION TECHNOLOGY

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IND-EKO

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In the past years thermal desorption technology is one of the most accepted methods for remediation of contaminated soil, construction waste and different mineral agents polluted by different organic contamination such as petroleum products, PAHs, halogenated hydrocarbons, solvents, phenols, oils, tar, and also of by products of pharmaceutical industry such as antibiotics and resistant pathogen bacteria.

One of the many advantages of this method is in the fact that once treated, waste could be reused in different construction projects.

The most developed countries in Europe are, at the same time, the most polluted for the reason of multiannual industrial growth that was without any control. Those countries, which in time developed ecological awareness, became origins in remediation of contaminated soils. The most important experiences in remediation of different types of materials and soil contaminated with organic contamination are coming from countries of Western Europe and SAD, and lately they are quickly stepping up development of the equipment for thermal treatment of soil. Along with brief description of the thermal desorption process, some of many world experiences of thermal treatment of soil are presented in this paper.

Key Words/Phrases: thermal desorption, remediation, contaminated soil, petroleum products, PAH. antibiotics, resistant pathogen bacteria

60. MORPHOMETRIC METHODS IN THE DETERMINATION OF HUMAN SHAPE VARIABILITY FOR THE CONSTRUCTION OF PROTECTIVE CLOTHING

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The morphometric methodology refers to methods for description of shape variation of organisms and the comparison of shape differences among samples applying statistical procedures.

Geometric morphometrics is based on the Cartesian coordinates of landmarks that are homologous across all measured individuals. This new method opens new opportunities for manufacturers to accurately identify and combine different materials, precisely define the pattern and construction of protective footwear, thus contributing to better safety features, comfort and fit resulting in wearing such footwear.

Head, body and feet shape characteristics are important anthropometric variables in designing and producing protective clothing, footwear and equipment. The definition of structural elements of protective headgear can greatly influence and thus significantly contribute to its protective properties and wear comfort.

The paper gives an overview of the study of human shape variations. Head, body and foot morphology differ between and among populations. Based on my own but also on the research of other authors the variability of the 3D anthropometric data obtained from 3D scanners will be presented. The determining of anthropometric characteristics gives manufacturers a powerful tool in designing protective clothing and equipment.

Key Words/Phrases: Geometric morphometrics, anthropometric data, 3D scanner, protective clothing

61. THE USE OF ANTHRAX AND ORTHOPOX THERAPEUTIC ANTIBODIES FROM HUMAN ORIGIN IN BIODEFENSE

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Active Technology Transfer Europe

Beek-Ubbergen

The Netherlands

Introduction

It is impossible to protect whole nations from the effects of bioterrorism by preventive vaccination. There are too many possible agents, the costs would be exorbitantly high, and the health risks associated with complex mass vaccination programs would be unacceptable for the public health authorities. Adequate protection, however, could be provided via a combination of rapid detection and diagnosis with proper treatment for those exposed to biological weapon agents. Preferably this should be done with therapeutics, which would be beneficial in all stages of infection to disease. Monoclonal antibodies, preferably from human origin, can be used to prevent severe complications by neutralizing or blocking the pathological elements of biological agents and these are the optimal candidates to be deployed in case of biological warfare or a bioterrorist event.

Methods

Recent research in aerosol challenged rabbits has shown that the application of a combination of a human monoclonal antibody against the protective antigen (PA) and one against the lethal factor (LF) of the anthrax toxin is highly efficacious even when given 48 hours after the exposure.

Results

In this models, all animals are symptomatic around 30 hrs after exposure and all exposed but untreated rabbits have died around 90 hrs after exposure. The successfully used effective therapeutic antibodies were fully human IgG1 (?-light chain) antibodies, with an affinity of around 10⁻¹⁰ M against the protective antigen (PA) and 10⁻⁹ M against the lethal factor (LF) toxin components of *Bacillus anthracis*.

Discussion/Conclusion

The lifesaving treatment of the animals with a normal dose has proven to still be effective when the treatment is given 48 hours after the lethal dose in a model where the mean time to death of untreated animals is around 90 hrs after exposure.

This is important for the real life setting as not everybody will immediately be aware of the infection with anthrax spores, or will have access to immediate treatment.

The ability of the dual antibody approach, enabling successful treatment even when victims are clearly symptomatic, will have a significant impact on managing the anthrax threat.

62. INDUSTRIAL CHEMICALS AS A THREAT IN UNSTABLE ENVIRONMENTS

Stef Stienstra

Active Technology Transfer Europe

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Introduction

The chemicals in the WW1 chemical weapons were weaponized as they were left overs of the chemical industry, which could not continue the production of their regular products due to the war. In modern threat scenarios this is still valid and as it is easier to transport chemicals nowadays, harmful chemicals are a realistic threat for safety and security.

Methods

The OPCW (Organisation for the Prohibition of Chemical Weapons) organised an international meeting in Tarnow, Poland, discussing the chemical safety and security and both threat scenarios and consequent management schemes were put together and discussed.

T

his gave an overview of threats and provided new ideas for the prevention of chemical incidences, which can be a ROTA (Release other than attack) or a chemical terror attack.

Results

With proper regulations, which do not interfere too much with the normal operations of chemical factories, laboratories and other chemical facilities, the public risk can be reduced enormously.

Both a 'Code of Conduct' for those involved with chemicals as computer assisted administration and regulation help with improving the chemical safety and security.

Discussion/Conclusion

International organisations, like the UN (United Nations) organisation OPCW in The Hague can help to suggest and/or to make formats in which misuse of dangerous and/or toxic chemicals by terrorists and/or failed states can be limited.

Self-regulation by the chemical industry organisations is preferred, but international guidelines should be initiated by politically well supported international organisations.



Dr. Stef Stienstra – Strategic and creative development manager in biomedical science, who works internationally for several medical and biotech companies as scientific advisory board member. He is CBRNe specialist with focus on biological and chemical threats and manages several CBRNe projects freelance on ad hoc basis. He is at this moment also developing with MT-Derm in Berlin (Germany) a

novel intradermal vaccination technology as well as a new therapy for cutaneous leishmaniasis for which he has won a Canadian 'Grand Challenge' grant. With IQ Therapeutics in Groningen (The Netherlands) he develops therapeutic antibodies against anthrax and orthopox viruses and with Hemacon in Düsseldorf (Germany) he develops an innovative blood separation unit. For Infection Control in Eemnes (The Netherlands) he develops a bio-disinfection system for bioterrorism consequence management and works on freelance basis for several consulting companies. He has finished both his studies in Medicine and in Biochemistry in The Netherlands with a doctorate and has extensive practical experience in cell biology, immuno-haematology, biodefense and transfusion medicine.

63. THE PATH FORWARD FOR GEORGIA'S LABORATORY NETWORK

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Georgia and the United States have built a hierarchical network of biological laboratories within the country of Georgia to carry out disease detection and surveillance with a goal of protecting both human and animal populations. This paper discusses the origins of the cooperative relationship between the two countries in this regard and describes this laboratory network and its three levels: (1) Laboratory Support Stations (LSSs), (2) Zonal Diagnostic Laboratories (ZDLs), and (3) the Richard G. Lugar Center for Public Health

Research (CPHR) which is the pinnacle of the network. There are both human and animal disease LSSs and ZDLs. The human disease laboratories are subordinate to the National Center for Disease Control and Public Health (NCDC) under the Ministry of Labour, Health and Social Affairs (MOH). The animal disease laboratories are subordinate to the Laboratory of the Ministry of Agriculture (LMA) and are under that Ministry (MOA). The CPHR is a special entity under the Prime Minister's Office that was designed to handle both animal and human pathogen samples requiring high containment (biosafety level 3 – BSL3 in addition to biosafety level 2 – BSL2) and to serve as the country's repository for all such pathogen samples. The goals, capabilities, and current activities of the lab network are addressed, as are challenges facing the network and opportunities offered to Georgia and the region by having this network. The network's main challenge is to balance the two CPHR roles of public health and research, the former a consumer of resources and the latter a potential generator of revenue that could help the system achieve sustainability. Two of the network's principal strengths are: (a) its unique pathogen library which is available for efficacy testing of prophylactics, therapeutics, diagnostics, and decontamination products, whether with or without animal models and (b) the regional network itself that provides opportunities for research on disease surveillance and epidemiology.

Key Words/Phrases: Republic of Georgia, Infectious disease surveillance, Emerging pathogens, Epidemiology



Mr. Mason Soule is an Associate Manager in Battelle's CBRNE Defense group. He also presently is Battelle's Georgia Project Officer residing in Tbilisi, Georgia where he is associated with a joint US-Georgian program to develop a sustainable biosurveillance and disease response network to support public health. Prior to this appointment, he had a continuing role in identifying collaborative

opportunities for Battelle with non-traditional international partners over the past two decades. In addition to his Battelle responsibilities, Mr. Soule was a Lecturer in the Department of Geography at the Ohio State University for much of his 28 year tenure at Battelle.

64. INTEGRATION OF MULTIPLE SENSORS SYSTEM, MATHEMATICAL MODELS FOR EVACUATION AND CHEMICALS PROPAGATION MODEL FOR 24/7 BUILDING PROTECTION

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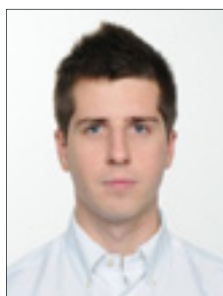
Article presents the main features of the project prepared by the consortium of Polish R&D Institutes and Pimco sp. z o. o. company, focused on public safety improvement in case of chemical hazards. The main practical result of the project will be the integration of systems, procedures and simulation of enhancing the safety of users of public facilities in the event of risk associated with hazardous chemicals. Locations such as subway stations, airport terminals and government buildings are extremely susceptible to this type of danger.

Constant development of tools for the monitoring of such dangers, and if they occur to identify the best means of evacuation is very important.

Mathematical model of pedestrian flow and air flow integrated into one complex system allows for the simultaneous consideration of the effects of movement of people during evacuation on the spread of chemical substances and the impact of these substances on humans. System will be based on Automatic Stationary Detection Systems ASDS 24/7 established by Pimco sp. z o. o., mathematical evacuation models created by Central Institute for Labour Protection – National Research Institute, chemicals propagation models elaborated by Department of Mathematics – University of Warsaw.

Validation of the model will be carried out based on the results of experimental research, based on test performed by The Main School of Fire Service.

Key Words/Phrases: Chemical Hazards, CWA, TICs, Chemical Threats, Evacuation



Piotr Glogowski, Msc (Eng.)
Optoelectronics. In 2008 graduated from the Military University of Technology Warsaw, Poland, Department of Electronics. He specializes in of applied optoelectronic technologies directed specifically for military and medicine applications. He started his professional experience in Central Institute of Labour Protection – National Research Institute as

Engineer, then as Senior Engineer in the Institute of Optoelectronics – Military University of Technology and now he holds position of R&D Director at Pimco sp. z o.o. Piotr Glogowski is author and co-author of many scientific and technical papers on Laser Detection Systems, LIDAR, IMS detectors and Laser Induced Fluorescence.

65. SECURING CITIES AGAINST THE THREAT OF CBRNE TERRORISM

Ilja M. Bensen
Elsa Schrier
IB Consultancy
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When securing a city, a neighbourhood, block or building, one cannot look at the individual object for a threat and risk assessment. Furthermore, a threat and risk assessment needs to be transparent and codified to allow others to repeat the analysis to check the results, or to compare the results of a later analysis when some of the variables have changed in time. IB Consultancy has further developed its function based system approach to Threat and Risk Assessment in the REACT project. This presentation will describe the research and results from the REACT project.

The first part of the Risk Analysis consists of a threat analysis of the International Zone of The Hague with a focus on the World Forum Convention Centre where different actors with malicious intent are identified and analysed. These actors range from deranged individuals to state actors and include the infamous religious fundamentalists like Al Qaeda. The result of this effort is a number of possible threat scenarios the international zone and specifically the World Forum are facing including the possible use of nerve agents like Sarin or the deliberate release of Anthrax.

The second part focuses on the vulnerability of the World Forum to these threat scenarios using functionality based approach resulting in an overview of the current vulnerability to CBRN incidents. This new approach will be set up in such a way that it allows for benchmarking between different infrastructures providing proprietors of infrastructure and policy makers with a useful tool to assess and compare infrastructures. Based on the comparison and the desired level of protection additional measures will be proposed to further reduce the vulnerability.

Ilja Bensen is the founder and managing director of IB Consultancy. Within the company, he is responsible for overall management and strategy, and he acts as project director for a number of projects. Ija has spoken, on behalf of IB Consultancy, at a large number of events and conferences on CBRNe, Threat and Risk assessment, counter terrorism and non-proliferation in Europe, Middle East, USA and Asia. Ilja developed the functionality approach for implementation of non-proliferation measures into measurable deliverables, moving non-proliferation from a fuzzy workshop based approach to a concrete methodology which delivers results. Before starting IB Consultancy, Ilja worked for the Netherlands Defense Research Organisation TNO and for a number of ICT firms. Ilja obtained a Master Degree in Political Science at Leiden University, and studied Business Administration and European Management at the Rotterdam School of Management and Corvinus University in Budapest.

66. EUROPEAN CBRN RISK ASSESSMENT METHODOLOGY

Elsa Schrier
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Belgium

Countering CBRN threats in an accurate fashion is hindered by a large number of variables. A large number of different actors, a large number of different agents and dispersion devices and a large number of different targets make it very complicated to assess CBRN threats. IB Consultancy developed a CBRN threat assessment methodology to overcome this problem. This methodology laid the foundations for the implementation of the EU CBRN Action Plan.

The EU CBRN Action Plan, adopted in 2009, aims at reducing the threat and possible consequences of CBRN incidents of accidental, natural or intentional origin, including acts of terrorism. It contains a large number of actions concerning prevention, detection, preparedness and response, as well as horizontal measures in the context of high-risk CBRN materials. One of the first Actions listed in this Plan urges EU Member States together with the Commission to establish and regularly update EU lists of high risk CBR agents of special security concern. IB Consultancy further developed and applied its methodology for drafting lists of high-risk Chemical, Biological and Radiological agents, including the characteristics that are deemed necessary for a proper ranking and selection of agents.

The methodology is based on both the likelihood of the threat and its potential impact. It includes a ranking scheme based on a thorough threat analysis to calculate and list the threat of specific agents. The tool serves as a comprehensive re-useable and expandable framework, meaning that more detailed information can be added if so required. New agents, selection criteria and modifications to weighing factors may be readily entered to update the EU agent lists of special security concern. In a changing security environment this methodology can demonstrate its added value.

Elsa Schrier works as a Consultant at IB Consultancy in Brussels, where she developed a clear focus on CBRNe and European Security and Defence Policies. She is responsible for two of the main growth areas for IB Consultancy: Business Consultancy and Non-Proliferation Services. Elsa obtained a Bachelor's degree in History (2005) and Bachelor's in Political Science (2008) at Leiden University, the Netherlands. In 2009 she completed her Masters in International Relations at Utrecht University, the Netherlands. After her studies she was awarded a scholarship for a Post Master's Course on Dutch Foreign Relations (64e Leergang Buitenlandse Betrekkingen) at the Netherlands Institute of International Relations Clingendael. At IB Consultancy she has been involved in a variety of projects, including a number of studies commissioned by the European Commission (DG Home Affairs, DG Mobility and Transport) and the European Defence Agency. Always fully aware of the latest developments within the European Union and the world of CBRN, she also advises companies on their optimal business development strategies in the defence and security market.

67. HIGH SECURITY ACCESS CONTROL

Dr. sc. Saša Petar

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Preventing terrorism, theft, fraud and incidents within CBRN industry is an inevitable requirement. Europe's absence of borders (Schengen agreement) provides free movement for every individual which significantly increases security risks. Use of modern technologies enables private companies, as well as authorities, to be one step ahead of possible threats. Software solutions like our Visitor Management System are one of the defense parameters for facilities with high security requirements. Adria Scan is specialized in developing and implementing software solutions for identifying people, verifying identities and managing these information which are used by security guards.

Key Words/Phrases: Access control, high security software solutions



Prof. Saša Petar, Ph.D., is an author of 21 business and self-help books, among which are "Business Decisions Making Management" (2009), "Change Management" (2009), "Manager at the Edge of the Nervous Breakdown" (2009.), "Are You Still Secure With Your Security" (2008), "The Dark Side of Management" (2005), "Are You Secure With Your Security" (2003), "How To Sell Yourself

Successfully" (2003), "Technology Transfer and technology Parks (1996)", etc.. His business background includes more than 20 years of various management positions in companies like 3M Representation office (Manager of Safety and Security Program), Croatian Chamber of Economy, The Zagreb Business School, Končar i Battery Company Munja. He is a lecturer on various faculties and Top 5 business schools in Croatia (Traffic and Transportation Faculty Zagreb, Business School VERN', Business School Libertas, Business School Zrinski, Business School for Tourism Utilus, CBA Coutrugli Business Academy, Business School Experta, Business School Filaks, etc.). Among various topics he is lecturing Business Safety Basics and Business Safety and Data Protection. He led business trainings in management, art of selling and communication (presentation skills, negotiation skills, selling skills), team communication (problem solving and motivation), change and crisis management, business safety and business intelligence in numerous companies in Croatia and abroad (Allianz, Auto Krešo, Auto Hrvatska, ANET, Coca Cola, dm, Exxon Mobil, Grawe insurance, Importanne resorts, IBM, INA, HEP, HUP, Končar, Konzum, Koprivnička brewery, Mozaik knjiga, Nexe grupa, Perutnina, Petrol, RAM 3, Raiffeisen Bank, Red Bull, T-Com, Zagrebačka brewery, itd.) He is an active member of Croatian Marketing Association (HUM), Croatian PR Managers Association (HUOJ) i Croatian Security Managers Association (UHMS).

68. SYNCHRONIZING EMERGENCY PREPAREDNESS AND EMERGENCY RESPONSE IN ORDER TO ENSURE SUCCESSFUL DISASTER MANAGEMENT

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The aim of successful disaster management is to prevent critical development by effective preemptive measures, to avert escalation focusing all available personal, organizational and technical resources in order to mitigate the consequences and respective risk to continuity. Therefore a careful synchronization of emergency preparedness and response measures is regarded key for an overall effective disaster management.

As any crisis is defined by unique and various evolving and changing characteristics, a generalized response limited to the merely mechanical employment of defined procedures is considered ineffective. Time has proven that there is no checklist covering all potentially disastrous contingencies. Solely a combination of effective and actionable principles reflecting the fundamental leadership values as well as the overall desired end state in case of major disasters and a trained and prepared internal crisis response organization will ensure active and successful emergency response for the organization affected.

Professional disaster management needs to be based on a thorough and comprehensive multi-level and inter-agency assessment of potential risks and the implementation of timely and adequate preemptive measures and actionable contingency plans. In order to ensure adequate emergency preparedness, common procedures, basic leadership principles, relevant up to date background information as well as an effective structural and procedural emergency organization need to be preemptively defined, trained, commonly employed and concisely documented. Organizations and organizational cultures need to live emergency preparedness as to merely impose another set of rules. Emergency preparedness advocates an inter-disciplinary approach, permanent awareness and a working "lessons identified-lessons learnt" culture. Organizational measures need to facilitate the effective employment of all available personnel, the focused use of necessary resources and the permanent effectiveness of the established leadership structure under austere conditions suffering the consequences of impaired technical infrastructure. Dependancy on the organization or legal body affected the respective preparations will be multi-layer, inter-agency and cross budget at best and therefore time consuming and difficult to implement. Failing to prepare can thus be considered preparing to fail.



DI Martin Gegenhuber, MBA – He works on Consulting in Risk and Disaster management, Leadership training. Shareholder, Chief Operating Officer Fa. EMPAG UG. Deputy Director of a Professional Firebrigade and head of the departments responsible for training and operational disaster management. Activities in Crisis Response, Pre-mission Training, Commanding officer at several

major missions of flood, fire and technical operations; Training and consulting in the field of risk and crisis management for government, organizations and business; Lecturer at training events for members of the national

disaster management operations; Permanent member of Austrian Federal Fire Service Association's crisis and disaster coordination authority, specializing in national and international missions; Permanent member of the disaster management board of the Tyrolean Fire Service Association; Principal lecturer for Staff Training in the Austrian Fire Brigade Association and the Fire Service Association of Tyrol; Chief of Staff of a fire fighters' association terrestrial mission management; Staff officer and liaison officer of an Austrian Armed Forces provincial command; Guest lecturer at university of Zagreb in "Management of Disaster Operations".



ROTT Bernd, MSD, LTC – Head of the Training Department / MW Center / AAF. Crisis response and leadership experience: A variety of tasks ensured a profound and up to date knowledge and experience in crisis management, leadership and the necessary relevant training/teaching capacities in military as well as civilian surroundings. Commanding platoon and company sized mountain

warfare elements for more than ten years, coupled with the responsibility for the military Avalanche Rescue and Disaster Relief element of the TYROL ensured hands on experience in up front leadership and crisis response. The following postings as S2, Ops Officer, 2iC/COS/CS-Battalion and Ops officer/6th Inf Brigade granted insight into multilevel operations, staff procedures, human resource management and the leadership of complex staff elements. That practical experience is complemented by various training and teaching assignments in the fields of leadership, crisis response, staff training and tactics at the AAF Military Academy, the AAF NCO Academy, the AAF Mountain Warfare Center, and the AAF National Defense-Academy. As a faculty member of the MA Program in Peace, Security, Development and international Conflict Transformation at the University of Innsbruck and member of the program coordination group of the Austrian Association for Research and Experimental Studies on Peaces and Elicitive Conflict Transformation? experience in the training and development of civilian students could be obtained and an active research background ensured.

69. CURRENT R&D ROBOTICS PROJECTS FOCUSED ON THE ENERGY SECTOR

Nandway Chitumbo Austria

The aim of this presentation is to give a global overview of significant current R&D robotics projects in the energy sector that are underway globally today and to expand on some of the driving factors present in such projects.

Furthermore the objective will be to look at all conventional energy sectors and to also give some indication on the varying degrees of the relevance of robotic applications in the sectors covered.

70. USE OF ROBOTICS IN RELATION TO FUKUSHIMA DECOMMISSIONING

Nandway Chitumbo Austria

Over the next two decades literally hundreds of nuclear facilities will come to the end of their working lives and require decommissioning. These range from nuclear power stations, submarines, fuel processing plants and mines. In the UK alone it is estimated that the total cost of dealing with the nuclear legacy is nearly \$100Bn.

Much of the decommissioning process utilises well established demolition techniques, however the overwhelming complication in the case of the decommissioning of nuclear facilities is the hazard of radiation release. Workers, the general public and the environment must be adequately protected. There is, however, considerable political pressure to complete the task quickly, and, in many cases, the only means of facilitating this is through the use of automation and robotics in order to reduce the dose exposure of workers." (The Use of Robotics and Automation in Nuclear Decommissioning, Derek W. Seward, Mohamed J. Bakari).

This presentation looks at the application of robotics in the Fukushima decommissioning effort currently underway as well as the issues that are revolving around their use.

Nandway Chitumbo – Mr Chitumbo has worked as a nuclear energy program development consultant in alliance with a top US international nuclear energy practice. He has worked with sovereign states in the development of their nuclear energy programs and assisted them in representation involving International Atomic Energy Agency (IAEA) related, legislative, regulatory and public policy issues so as to ensure IAEA international nuclear law compliance. Mr Chitumbo has also assisted sovereign states on agreements for cooperation concerning peaceful uses of nuclear energy, IAEA safeguards agreements and additional protocols, laws and international agreements relating to nuclear liability and the drafting of contracts relating to the transportation of nuclear materials. Prior to becoming a nuclear energy program development consultant, Mr Chitumbo worked with a global leader in measurement solutions for nuclear security and safety in the areas of health physics, radiation protection, reactor chemistry, support and environmental monitoring programs, contamination/material diversion control, waste management, IAEA nuclear technology regional and national technical cooperation programs and support for IAEA non-proliferation efforts. At the company he also engaged in investigating how American nuclear energy legislation, European Union nuclear energy legislation (including UK nuclear legislation), nuclear legislation in other non EU nuclear energy states, international nuclear law and International nuclear agreements and conventions, might affect the capacity of the company to commercially exploit the relevant market, and presented the findings in report form together with any findings of potential legal and commercial liability issues and concerns that might have arisen. Later on when the company was taken over by a nuclear energy company, he also worked in support of the commercial nuclear plants business unit of the nuclear energy company. Currently Mr Chitumbo is advising nuclear energy relevant technology companies on the potential role they can play in enhancing/facilitating utility company compliance to the post Fukushima regulatory environment that to some extent has been defined but also remains relatively dynamic and continues to evolve further. As part of this effort, he has been interacting key nuclear energy commercial players and organizations and regulatory

entities both in Europe and the US as well as in Asia. Mr Chitumbo has also worked as a legal consultant for the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) and the Organization for Cooperation and Security in Europe (OSCE). Languages: English and German native speaker, fluent Italian and workable French. Education: University of Bristol Law Degree (LLB) with honours and European Union Energy Law Specialization, 1998.

71. USE OF ROBOTICS IN INDUSTRY

Rolf Dieter Schraft

Prof. Dr.-Ing. Dr. h.c. mult.
Head of the Fraunhofer-Institute
for Manufacturing Engineering
and Automation (IPA)
Stuttgart
Germany

We have seen many different uses for robots in a vast range of industries. They are in principle a simple piece of equipment and therefore highly adaptable. The 6-axis industrial robot is certainly the most flexible type and can be used in many different ways. In addition there are more specialist robots such as the ABB IRB 340 pick and place robot that are used in quite specific applications.

Some applications are very simple and have been done thousands of times before, but we are finding more and more industries that are turning to automation and more specifically robots, to increase production and quality while lowering costs and waste. With the prices of used robots so low and the pressures on manufacturing companies so great robots are no longer the preserve of the motor industry. For every robotic application in existence today there are hundreds of derivative and related possibilities. With hundreds of thousands of robots installed worldwide in industries as diverse as sawmills to pharmaceuticals robots have time and again provide huge gains in productivity, safety, economy and quality.

This presentation will serve to give an accurate overview of the global relevance and significance of the application of robotics in industry as a whole.

Rolf Dieter Schraft (Prof. Dr.-Ing. Dr. h.c. mult.) is head of the Fraunhofer-Institute for Manufacturing Engineering and Automation (IPA), Stuttgart, Germany. Prof. Schraft studied Mechanical Engineering at the University of Stuttgart and graduated in 1969. In 1976 he got his Dr. degree. He started the research group for Material Handling and Assembly at the IPA which did numerous projects and developments for national and international research agencies and mainly for industry. Right now he is very much involved in promoting and developing service robots.

72. USE OF ROBOTICS SPECIFICALLY IN THE NUCLEAR ENERGY SECTOR

Rob Buckingham CEng
FIET
UK

In the nuclear power generating industry, teleoperators have been well-utilized in the maintenance role for more than 4 decades. Several features of maintenance make it a good application for teleoperators in this arena. First is the low frequency of the operation, which calls for a general-purpose system capable of doing an array of maintenance tasks. Second, maintenance and repair require high levels of dexterity. Third, the complexity of these tasks may be unpredictable because of the uncertain impact of a failure. For these reasons, the choice for this role is often between a human and a teleoperator. Thus, when the environment is hazardous, a teleoperator is usually the best selection. If humans in protective clothing can perform the same job, the benefits of having teleoperators continuously at the work site need to be weighed against the cost of suiting up and transporting humans to and from the work site. While humans are likely to be able to complete tasks more quickly than teleoperators, using teleoperators can: (1) shorten mean time to repair by reducing the response time to failures, (2) reduce health risks, (3) improve safety, and (4) improve availability by allowing maintenance to take place during operations, instead of halting operations.

This presentation seeks to examine the examples and benefits of the use of robotics in the nuclear energy sector.

Rob Buckingham CEng FIET was a National Engineering Scholar and UKAEA sponsored student. He completed first and second degrees on the Special Engineering Programme at Brunel University before his PhD at the University of Bristol. His research into multi-arm robots was funded by Sowerby Research Centre, now part of BAE Systems. Rob Buckingham then took up a lectureship in Mechanical Engineering and led a research team investigating the application of robots in the food, textiles and medical sectors. He published widely before leaving academia to set up OC Robotics. Rob Buckingham is available for interviews and comments on the following subjects: robotics in confined spaces; medical robotics; robotics in the human environment. Rob Buckingham is a Chartered Engineer and Fellow of the Institute of Electrical Engineers.

73. USE OF ROBOTICS SPECIFICALLY IN THE OIL & GAS SECTOR

**Trond Michael Andersen MSc
Norway**

The use of robots in the oil and gas industry has been limited. The industry has generally only automated processes that are difficult or impossible for people to perform, or that would dramatically improve HSE issues. Examples of such applications are found in subsea facilities and pipeline inspections, in the automation of drilling operations, well tractors, and in special inspection applications. Very often, the industry has experienced a negative impact on productivity with automation, running counter to the general goal of automation. This trend, however, is now changing. Today, the oil and gas business sees robotic technology as an enabler to increase

efficiency, productivity, and improve HSE issues. The oil and gas extraction processes are generally dangerous and risky. Offshore facilities operate in rough seas and all kinds of weather conditions. In addition, hazardous environments are encountered, for example those with high concentrations of dangerous gases, such as hydrogen sulphide (H₂S). The use of robots in such environments has the potential to reduce human exposure to hazards. They are designed and manufactured to operate reliably 24/7 and can be designed to cope flexibly with a range of operations. With greater demands for energy and the increasing difficulty experienced by the industry to extract oil and gas economically, it is clear the oil and gas industry will have to change its strategy and think afresh, especially if it is to successfully extract tail-end production from existing sites and exploit the smaller, more marginal oil and gas fields of the future. (Robotics in oil and Gas (robotics.youngester.com)). This presentation aims to give an accurate picture of the current use of robotics in the oil and gas industry as well as the factors that are driving the such use.

Trond Michael Andersen – Management: Various leadership positions in Marintek, Statoil and HiST. Research: Project leader for many projects related to Asset Management Research and Development in Statoil, NTNU and Marintek, national and international: Topics: Asset management, systems engineering, e-field development, collaboration technology, maintenance management, turnaround optimisation, estimation of equipment residual life, reliability analysis, robotics, Concurrent Design, Condition Monitoring, Integrated Operations.

74. MULTIFUNCTIONAL ROBOTIC SYSTEM FOR CBRNE APPLICATION

Konstantin P. Darmaniyan
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DOK-ING Zagreb
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Darko Dužanec
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Croatia

Robots can facilitate the response planning, maintaining awareness, distancing responders out of harm's way, and allowing immediate site feedback. Current CBRNE response is human-based and incorporates hazard detection technology, GPS units, radios. Robots have been deployed for emergency response tasks including: urban search and rescue (USAR); technological and natural disasters. The goal of such system is to support fielded missions for socially, economical and technological relevant problems.

CBRNE incidents vary dramatically based upon the hazard, incident size, and response duration, thus the required response activities vary significantly. A CBRNE incident may be a deliberate act or an accidental contaminant release. The incident response

encompasses a large collection of individuals and associated equipment. The overall response relies on a structured hierarchy of responders who fulfill different responsibilities and employ face-to-face or radio communications. Our initial objective was to understand the current CBRNE response based on the human responder activities. Our long-term objective is to design and upgrade the system by understanding the cognitive and physical demands of the human response activities before developing the associated multifunctional robotic system technology.

The system should include the following: Integrated command and control centre on CBRN logistic intervention vehicle with decontamination tool kit, trailer and multifunctional robotic system for CBRNE application. This presentation is exploring more efficient use of robotics technology together with rapid responder in order to maintain safety and security in the following areas: emergency preparedness enhancement, reconnaissance and information collection, radiological and chemical detection and identification, monitoring and high resolution data delivery as well as possibility of high accuracy for detection and analysis from long range distance, firefighting in high danger areas (terrorist site, fires with extreme high temperatures without oxygen presence and explosions), object/obstacle removal on the path of intervention, removal and collection of objects, water supply in critical conditions, mobility at great distress from safe distance (tracked vehicle), and remote control from safe distance.

Konstantin P. Darmaniyan – Career Summary: 16 calendar years of military service including service with UNPROFOR, UNCRO and UNTAES missions in the Republic of Croatia. 5.5 years of experience in Mine Action programs both the UN-run and the Croatian Mine Action National Program (CROMAC) with up to 16 internationals and 156 local staff. 11 years of experience as the private consultant in Sales & Marketing, Training development and performance, Special Project Management: planning, budgeting, resources allocation and their management in the fields of Mine Action, Robotic Vehicles and Firing Security.

Darko Dužanec – In 1993 he becomes a student of the Electro technical faculty of Zagreb, in the field of industrial electronics. In 1997 he starts working in Tehnomehanika, Marija Bistrica as a designer. There he modernizes the control systems of platforms and cranes, which then were still produced in relay technology. In 1999 he was promoted to the Assistant of the Head of Development of Tehnomehanika. In 2001. he joined the new factory of firefighting vehicles Ziegler d.o.o. as a designer. There he starts with the development and improvement of control systems for firefighting vehicles. He develops his own control system for special firefighting vehicles. The result is the first firefighting vehicle with decentralized control system based on CAN bus developed and produced in Croatia delivered in 2004. In 2005. he received his master degree on the Faculty of electrical engineering and computing in Zagreb on the topic "The application of CAN protocol for firefighting vehicle superstructure control". During his master study he meets genetic algorithms for the first time and starts to explore possibilities to use it in firefighting systems and robotics. In 2010. he received his Phd degree on the Faculty of electrical engineering and computing in Zagreb on the topic "Improved microgenetic algorithms in robot control systems".

75. ROBOTICS APPLICATION IN MILITARY, POLICE AND CIVIL DEFENSE

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Technical Advisor/Consultant
for Foreign Trade Training and
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DOK-ING Zagreb
Croatia

The last 22 years of the human race history have been seriously affected by numerous civil wars and regional conflicts on various grounds. This became a fertile soil for religious fanatics, extreme autocratic regimes, international criminal groups and terrorist organizations. Furthermore, a threat of possible use of CBRN weapon and other modern destructive technologies against both the military and civilians becomes constant.

Since recognition of such threat military, police and civil defense worldwide have been changing their tactics toward active use of modern robotics by involving it into reconnaissance, demining, convoy support, dealing with EOD/IOD threat, fire-fighting in most extreme environments, etc. Whether it is the EMERCOM of Russia firemen deal with explosions and fires at the military depot somewhere in the mid-Russia, the US Marines demine their way through to accomplish a combat mission in Afghanistan, the Swedish Royal Engineers deal with a threat of magnetic plates in the north part of the same country or the Columbian Marine Infantrymen carry out the task of opium field and hidden drug storage' destruction somewhere in the heart of jungles, they are supported by the DOK-ING Robotics. It is multi-purpose, versatile platform, radio- and tele-operated, robust, well shielded against possible explosions, with high maneuverability in remote and cross-country areas. This robotics is to make people safe and operation successfully completed.

76. ROBOTICS SYSTEMS IN DEFENSE AGAINST CBRN THREATS – UGVs FOR CBRNE OPERATIONS

Eng. Giuliano Franceschi

R&D Systems Manager
Oto Melara – S.p.A.
Dr. Ing. Teresa Spadafora
Dr. Ing. Fabio Varone
Italy

The Armed forces, fire brigade and civil protection have a critical need to deploy CBRNE sensors that are capable on real-time, of on- site interrogation and environment detection (ground, soil, liquids...) to provide immediate data for force protection as well as environmental monitoring sampling and testing. For the personnel incharged of these operations there is a significant risk of exposure to hazardous material, for this reason an employment of ground robotic system would allow to carry out the same activities by remote and safe position:

The robotic platform equipped with CBRNE sensors can perform: Automatic detection of CBRN agents; Transmission of data to the remote station; Collection and transport of samples from the contaminated area to the remote station. Meanwhile the remote station, housed for example on a customized CBRNE Vehicle that includes a mobile laboratory can perform: Qualitative analysis of samples taken on the contaminated site; Real-time simulation in order to map the contaminated area by the evaluation of diffusion; Routes of CBRN agents; Driving the mobile unit; Control the sensors on board the robot. In this way is facilitated the effective risk assessments, mitigation response, and consequence management decisions if a threat is detected.

Eng. Giuliano Franceschi – Graduated in Electromechanical Engineering in 1978, Reserve Officer in the Italian Navy (Naval Armaments Corp). In 1981 joined OTO Melara (R&D Department). Project leader of Heavy Tracked Vehicles (in particular Ariete MBT). Project leader of the 127/54-C modernisation programme. Project leader of the 127/54-LW development programme. Appointed Executive in 1999. Naval Systems & Munition coordinator in 1999. Systems & Technologies Manager from 2000 to 2002. Products & Technologies Deputy Manager from 2003. Robotics research center coordinator from 2005. National Speaker for Italy to ELDIG from 2007 to 2012. National Focal Point in the NIAG SG 111 (Options for adoption of 155 mm Naval Gun). Chairman of the NIAG SG 127 (127 mm Scout Munition for NFS). Chairman of the NIAG SG 138 (Short Range Anti-Air – Anti Surface Guided and Gun Launched Ammunition against unconventional threats). Representative for OTO Melara to OSDIFE since 2010 and member of the Technical Advisory Board. Robotic Systems Manager from 2010 to 2012. R&D Systems Manager from Jan 2013.

77. PROTECTIVE CLOTHING RECYCLABILITY

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Although textile recycling is known from an ancient time, today it still manages to capture our attention, especially in the area of protective and smart textiles. Last decade we are witnessing a great increase in the production and utilization of such textiles, and as can be expected the amount of this purposefully targeted textile that has to be safely disposed is growing endangering in that way environmental capacity of Earth. Having all that in mind as well as a fact that most protective and smart textiles are not simple ones impelled a lot of textile scientists and engineers in the research of possible ways in which such 21st century textiles can be reused, recycled or disposed. Within this paper some possibilities of protective and smart clothing recyclability are presented. Focus is put on standard combat army uniform, chemical/biohazard hazmat suit and e-shirt that can be used by soldiers or patient.

Key Words/Phrases: Protective Clothing, Smart Textiles, Recycling, Disposal, Green Design

78. NANO-FUNCTIONALIZATION OF TEXTILES: PROTECTION AND HEALTH SAFETY

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Functionalization of textiles with special nanostructures in processes of coating, impregnation or spraying is a high demanding issue. Nano scale particles can be arranged also in a form of aggregates or agglomerates. Structure, surface properties and potential toxic risks of all species are similar, so release of nanoparticles in any form should be controlled by physical or chemical methods. Nanoparticles identification, testing protocols and risk assessment during skin exposure are issue of standardization in the field of nanotechnologies. The aspects of nanotechnology: science-based health, safety and environmental practices; nanotechnology products and processes are examined in a paper. University of Zagreb Faculty of Textile Technology and its Textile Science Research Centre are one of the stakeholders to promote and practice public health education jointly with the know-how in the area of new technologies.

Key Words/Phrases: Nanotechnology, Protective textiles, Science-based health, Nano-safety

79. NEW APPROACHES FOR PROTECTIVE FIREFIGHTERS' CLOTHING – CB PROTECTION

Prof. Zvonko Dragčević, Ph.D.
Prof. Zvonko Orehovec, Ph.D.
Assist. Prof. Anica Hursa Šajatović, Ph.D.
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Several years ago, it became quite apparent that firefighters are the usual first responders to many major disasters. With the increased threat of terrorism, the types of hazards that firefighters may face have expanded dramatically. Turnout clothing cannot protect firefighters in an environment where there has been a release of chemical, biological, radiological or nuclear (CBRN) agents. Today, some protective clothing systems are developed that firefighters being provided with protection during structural fire, but also permitting protection for the types of hazards that can occur during terrorism events. In 2004 Technical Support Working Group in

USA sponsored research and development project to develop protective ensembles that would afford firefighters the extra protection that was needed in the case of a terrorism event that involved CBRN agents. In this paper firefighters clothing with chemical and biological (CB) protection are described. The special design (includes functional design and ergonomically features) of CB firefighters' protective clothing is shown. Also, according to the NFPA 1971 standard minimum design, testing, performance and certification requirement for both structural and proximity fire fighting ensembles and ensemble elements are specified. Optional requirements for protection from CBRN terrorism agents are included in NFPA 1971 standard, 2007 edition.

Key Words/Phrases: Firefighters clothing, Chemical and biological protective clothing, Functional design of protective clothing

80. MAG INTERNATIONAL

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MAG International is the new approach to the management of the global security and safety emergencies realized by the Intelligent Integrated Security Safety System – I2S3 – and the Antiterrorism Antipiracy Galatolo Method – AGM training.

The potentiality applications of the MAG International deal with not only the ships but also modu, port facilities, ports, industrial installations, military bases or military installations especially in hot spot.

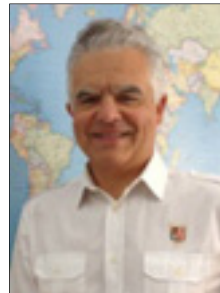
MAG International is based on: Continuous self improvement; Training and consultant; Real time response to security and safety incident; Data acquisition and process – reengineering bound to operative and predictive risk analysis per SAM (Sensitive Area Monitoring).

The AGM training consists in high skilled safety and security training that presents 3 characteristics: modularity, multimodality, top skilled trainers. The trainers have been trained c/o Observatory on Security and CBRNe Defence Rome in agreement with Roma Tor Vergata University. The training includes specific modules of Psychology (stress, emergency, aggressive behaviour).

The I2S3 has been conceived upon 3 informatic platforms. Operative platform: where are allocated the sub systems of: Knowledge; Training; Management; Alert and Consultant.

Data fusion & integration platform: collect data information from remote sensing and non lethal systems of close protection, provides to the data fusion and the integration of the information come from the operative platform, remote sensing and non

lethal system, sends the data fusion and integration to the Smart Decision and Support System. Smart Decision and Support System: collects the information from data fusion and integration system, process these information, up to date the dashboard. The Dashboard gives at the operator, in real time, the score (from 1 to 10) of the security/safety of the ship/modu/port facilities etc... tanks to the data acquisition and process and the data fusion and integration of all the informations.



Adm. Giovanni Galatolo, Ph.D.

– Work Experience: 1976-1980, Deck Officer Italian Merchant Marine (4 years ocean going) from Cadet Officer to 1st Officer. 1981-1983, Italian Navy Officer (3 years sea going) from Cadet to Ensign*. 1984- 2011, Italian Coast Guard officer from Ensign to Rear Admiral: 5 years sea going as Captain Coast Guard patrol ships; Port Captain Santa Margherita Ligure, Gioia

Tauro; expert of maritime security c/o European Commission and Libya (2011); expert of PSI (Gibuti, New Zealand, Croatia, Marocco, United Arabi Emirates); international mission in Albania (2003-2006), Ex Yugoslavia (Sharpe Guard), Libya, France, Estonia*. 2011-2013, Safety and Security Trainer c/o Germanischer Lloyd Academy of Genova; Scientific Director of Safety and Security Courses c/o OSDIFE and Roma Tor Vergata University. 2011-2013, Maritime security advisor c/o Tema Safety and Training Taranto, Società Italiana di Monitoraggio Rome, Società Castalia Rome, Associazione Nazionale Marinai d'Italia Rome, Società Italiana Elicotteri, Vitrociset S.p.A. Rome. 2013, Port Manager and general manager "Hudson Albania" company in Roman Port Dures (Albania). 2013, General Manager MAG International, a new approach to homeland maritime security Rome.

81. COUNTER PROLIFERATION

Peter Lejeune

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Virginia
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Counter proliferation is the proactive set of actions that can be taken to prevent the proliferation of weapons, in this case weapons of mass destruction. It is a complex capability and one that involves all levels of government. First it requires both the implementation and the understanding of intricate export laws, laws which must be understood not only by the nation passing those laws but other nations as well. International diplomatic actions and understanding are vital, for to be successful counter proliferation needs to be multilateral.

It also involves a variety of sophisticated technologies. These technologies encompass everything from border security, to actually protecting a countries cities and territory to assisting in the collection of intelligence. These technologies, and other skills, support the collection of intelligence which is essential to successful counter proliferation operations.

Every day the tradecraft of counter proliferation becomes more complex for it now reaches well beyond the old state on state structure and it encompasses several different yet related threats – terrorism, weapons of mass destruction, international espionage, and the theft of intellectual property and its trafficking on black market trade networks. No longer are the adversaries clearly understood for they involve a complex matrix of criminals, small special interest and terrorist groups, nations working through proxies and even lone wolves.

To counter this growing threat requires collaboration between a variety of national agencies and strong collaboration between nations.

Key Words/Phrases: Proliferation, WMD, Detection, Intelligence, Counter terrorism



Peter Lejeune is president and founder of the International Institute for Non-Proliferation Studies which specializes in international science and policy communications and collaboration. Former Director of Emergency Planning and Response, Mayor's Office, City of New York and Director Bureau of Water Register (water department). During more than 30 years of working with the

US Department of Defense, Federal government, commercial and state/local governments he served on a number of advisory groups and panels addressing the threat of the terrorist use of WMD. These positions have included advising and training Pennsylvania National Guard, WMD Civil support team; jointly standing up and serving on the Emergency Response Network Initiative Working Group, a DoD/FEMA joint program created to review current and possible future communications capabilities available in a disaster; former Director of New York City Task Force on Hazardous Materials former Member of the Threat Reduction Advisor Committee (TRAC), at the US Defense Threat Reduction Agency. As a long standing member of the Los Angeles County TEW (LA County Terrorism Early Warning Group) he led their forensics cell for the Democratic National Convention in 2000. Participated in the creation of the Harvard Kennedy School of Government's "Innovations in Homeland Security" program and served as the lead evaluator for this program performing annual reviews of applicants for the award. He also served as an advisor to the Director of the Illinois Homeland Security Innovation and Entrepreneurship Center (HSIEC) and is a member of the advisory board for James Madison University's Institute for Infrastructure and Information. As a member of an Operational Review Red Team, Los Alamos National Laboratory he was asked to review many aspects of LANL's operations, including security as part of an internal effort to realign the laboratory to new customer needs post 9/11. Chaired meeting between FEMA and the Canadian Office of Critical Infrastructure Support and Emergency Preparedness (OCIEP) when the relationship between the two agencies had reached an historic low in order to rectify the relationship. He is the inventor of a patented bio collector and he has worked on many technical design teams with corporations and government. He has co-authored several books including HotZone, Countering Biological Terrorism in the U.S and the article Defending the Subways Against Biological Terrorism, in Transit Policing all with the Potomac Institute for Policy Studies.

82. NEW EU REGULATION ON THE MARKETING AND USE OF EXPLOSIVES PRECURSORS IN FUNCTION OF PROTECTION FROM MISUSE AND ILLICIT MANUFACTURE OF EXPLOSIVES

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Some Member States have already adopted laws, regulations and administrative provisions regarding the placing on the market, making available and possession of certain explosives precursors. The illicit manufacture of explosives should be made more difficult by laying down concentration limit values in respect of certain explosives precursors. Below those limit values, the free movement of those explosives precursors is ensured, subject to a safeguard mechanism; above those limit values, the access of the general public to those explosives precursors should be restricted. Members of the general public should therefore not be able to acquire, introduce, possess or use those explosives precursors at concentrations above the limit values. However, it is appropriate to provide for members of the general public to be able to acquire, introduce, possess or use such explosives precursors for legitimate purposes, only if they hold a licence to do so.

Furthermore, in view of the fact that some Member States already have well-established registration systems, which are used to control the making available on the market of some or all of the substances restricted by Regulation EC No. 98/2013 which are not to be made available to members of the general public, it is appropriate to provide a system of registration applicable to some or all of those substances. In view of the general aims of the Regulation EC No. 98/2013, it is appropriate to provide for a reporting mechanism that covers both professional users throughout the supply chain and members of the general public involved in transactions which, by reason of their nature, or scale, are to be regarded as suspicious. To that end, Member States should set up national contact points for the reporting of suspicious transactions.

Conclusion: With this regulation EU has established mechanism for the control of producers /suppliers /downstream users for the free flow of explosive precursors by giving the economic operator possibility to cancel or to redraw suspicious transaction. In a case that economic operator has intention to complete suspicious transaction there has to be mechanism for the Competent Authority to have oversight on all transactions with listed explosive precursors included.

Key Words/Phrases: Explosive precursors, marketing, EU Regulation



Mr. Damir Piršić is Project Leader for REACH Implementation. He graduated from Faculty of Agriculture, University of Zagreb and took his Master's Degree from Faculty of Economics, University of Zagreb. Mr. Piršić has been employed in Petrokemija d.d., Fertilizer Company, Kutina, Croatia, since 1997. Petrokemija is the biggest producer of fertilizers in Southeastern Europe. He held

different positions in the company. He was responsible for the company strategic projects as Dual Use Control; he was Team Leader in Antidumping Case, Project Manager for the Accession to EU. Since 2008, Mr. Piršić has been the Director of Petrokemija's daughter company, Petrokemija, d.o.o. Slovenia.

83. ACETYLCHOLINESTERASE REACTIVATORS AND SURFACTANTS WITH A PROMISING APPLICATION POTENTIAL

Martin Kunes¹

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Daniel Jun³

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Acetylcholinesterase (AChE) reactivators: Of several hundreds novel AChE reactivators tested in our laboratories, three candidates (K027, K203 and HI-6 DMS) were more thoroughly evaluated for potential introduction into the market. Oxime K027, seems to be the best candidate for future use as a universal reactivator for the treatment of OP-pesticide poisonings due to its low toxicity and relatively high reactivation efficacy. The second reactivator – oxime K203 – seems to be currently the best oxime for treatment of tabun intoxications. If compared with standard oximes (HI-6, MMB-4, trimedoxime, obidoxime or pralidoxime), its pharmacological and toxicological properties favour this oxime.

Cationic surfactants: The surfactants based on the quaternary heterocycles are well known. The amphiphilic nature of these compounds is responsible for their properties and used for various applications: adsorption at interfaces (e.g. wetting, dispersion of solids), and aggregation in aqueous and non-aqueous solutions (detergency, emulsification, solubilization, preparation of nanoparticles, catalysis of chemical reactions). Its surface activity allows them to form the micelles. A quaternary nitrogen salts with alkylating chains are used as disinfectant in

many preparations (e.g. eye drops, ointments, solutions). Five series of the surface-active agents based on the quaternary heterocycles were developed. Several compounds from each set were chosen and tested for their antibacterial activity. According to the obtained results, it seems that several of tested compounds reached extraordinary promising results. Due to this, these compounds are recently considered to be a part of novel disinfection mixtures.

Supported by the project funded by the European Union (ERDF) and the Czech Republic's state budget (CZ.1.05/3.1.00/10.0213).

Key Words/Phrases: Acetylcholinesterase reactivators, surfactants, oximes, organophosphorous poisonings, disinfection



Dr. Martin Kuneš graduated from University Palackého (MSc) at Faculty of Sciences (Olomouc, Czech Republic). Afterwards, he obtained his PhD from Toxicology at the Faculty of Military Health Sciences, University of Defence (Hradec Kralove, Czech Republic). Currently works in University Teaching Hospital in Hradec Kralove as a Biomedical Technology Transfer Specialist and as a

researcher at the Department of Preclinical in vivo testing in Biomedical Research Center. His area of research is preclinical in vivo testing (pharmacokinetic and toxicity studies) newly developed compounds and drug formulations.

84. MODERN IT TOOLS AND EQUIPMENT TO INCREASE RELIABLE INFORMATION ON CHEMICAL ACCIDENTS

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OHS Expert Assistant

Safety Advisor

Petrokemija

Kutina

Croatia

Many different chemicals are in use nowadays around the world having various properties and potential hazard to health and environment. Industry is the main user of large amount of dangerous substances which could present risk during use in production process or during an accident with impact to the employees and surrounding population depending on the severity of the event. Those substances prior being used as a raw material, intermediates or goods have to be delivered on or off site. While transported, they also present a hazard and security risk which depends on potential misuse.

Today public is more aware of potential hazard and risk from chemicals and they have right to demand reliable information and cooperation of Local Authority and Operators in order to take all necessary measures for reducing the risk.

So, whether during an exercise or actual accident, reliable estimation of release rate, impact and threat zones as well as a projection of event impact time on specific area and duration is of most importance. Today it is possible to create scenarios and to model different types of chemical accidents using state of the art software tools incorporated with real time meteorology, fixed and/or GPS based sensors in very short time.

We in Petrokemija, Plc Fertilizer Company believe that as a responsible Operator, we need to take measures that are above the minimum prescribed to provide as high as possible level of safety to our employees, contractors, visitors as well as to the local community.

Key Words/Phrases: IT Tools, ERP, chemicals, evaluation, hazard, risk assessment

85. INITIAL ASSESSMENT OF CBRN/HAZMAT INCIDENTS: THE FIRST HOUR

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The initial stages of response to a CBRN/HAZMAT incident provide much room for error. Decisions made incorrectly in the early stages of response can waste resources, delay proper actions, and risk life, health, property, and/or environmental damage. Three elements that are beneficial to effective response are the use of assessment teams, proper orientation of command structures, and the "GEDAPER" scheme. Assessment teams, such as the US JHAT model, can serve to increase overall effectiveness of incident response. Command structures need to focus less on large command centers and complex procedures, and must let field commanders assume their proper place. Finally, the GEDAPER process, developed for HAZMAT incidents by Mr. David Lesak in 1998 and promulgated in many training courses, is a useful template for initial and ongoing incident management.

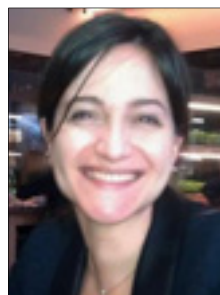
Key Words/Phrases: incident command management assessment GEDAPER

86. IF REACT

Ana Mikačić

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The terrorist attacks in Tokyo (1995), New York (2001), Madrid (2004) and London (2005) have proven international cities and capitals to be a target for terrorists. Especially the danger of terrorist attacks using CBRN-means is often underestimated. However, not only man made threats are an issue, also pandemic outbreaks, accidents and other incidents involving dangerous substances and use of CBRN agents by state parties, all form threats to our European society and pose challenges for first responders. The current technical means of first responders to handle an incident are currently far from ideal. Existing forms of protective clothing either do not provide the required level of protection or have other shortcomings, such as being unaffordable or very difficult to use. PPE is heavy and bulky and is a physiological burden that interferes with the operational duties of first responders. Finally, PPE is not standardised or universal. IF REACT Project answers to the FP7 call SEC-2011.4.4-1, CBRN individual Protective Clothing where the task is "to develop innovative protective clothing for first responders and/or for the public in case of a CBRN crisis". Having first responders protected adequately whilst maintaining a high standard of operability in case of a CBRN calamity is of the utmost importance as first responders are our 'first' line of defence. CBRN protective garments for first responders need to provide protection against a myriad of threats whilst still allowing the first responder to fulfil his or her duties. The IFREACT project will aim at narrowing aforementioned technological and standardisation gaps through the development of new and innovative key functionalities: a tool that allows end users and procurement staff to select the best PPE system for the mission of the first responder and the expected threat. A PPE system that: addresses the real protection needs of the typical users; provides adequate protection, while keeping the burden of the system as low as possible; includes solutions for hand and foot protection as well as respiratory protection; addresses tactical needs as communication, (indoor) localisation & situational awareness with affordable, robust and easy to use technology. The project will develop solutions for a number of professional responders, according to the typology developed by CEN Workshop Agreement 43, (Document CWA 16106). This project will focus on initial responders, CBRN professionals and emergency services, including medical personnel.



Ana Mikačić has graduated from the Faculty of Philosophy, University of Zagreb. She holds a master degree in the EU Integration Studies from the University of Bonn, Germany. She worked for the Regional Centre for Assistance and Disaster Relief as Advisor for International Relations. Ms Mikačić is currently holding a position of Senior Advisor in the National Rescue and Protection

Centre (DUZS) in charge of the activities related to the EU project management in the field of civil protection.

87. AN UPDATE ON THE PHAGE TECHNOLOGY

David Trudil
USA



David Trudil has almost 40 years experience in the diagnostic field, including chemical/ biological / nuclear officer with the U.S. Army, positions with Pfizer, Becton Dickinson, New Horizons Diagnostics and most recently with Battelle Memorial Institute. He has managed programs in the Far East, former Soviet Union, Europe, and Middle East. He has authored and assisted in numerous

publications and patents on the subject of rapid bacteria detection and sampling. Most recently on the use of Phage Associated Enzyme in detection. During Desert Storm I he assisted in the development of rapid collection and detection systems for BW agents, as well as generic bacteria detection for the initial Biological Detection System. Dave is a member of the US Department of Homeland Security working group on rapid biological detection.

88. CAPACITIES OF BOSNIA AND HERZEGOVINA IN THE FIGHT AGAINST CBRN TERRORISM

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Faculty of Criminal Justice
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Authors analyze the capacity of Bosnia and Herzegovina in the prevention and countering potential terrorist use of CBRN weapons in the attacks.

This paper provides an overview of legislation concerning the duties and responsibilities of law enforcement agencies in specific conditions caused by terrorist activities.

Authors analyze the readiness of agencies responsible for controlling and eliminating any possible consequences resulting from terrorist attacks.

It focuses on the state plan for civil – military cooperation in case of response to the terrorist attacks and the aftermath rehabilitation.

The paper also analyzes the possibility of preventive actions in order to protect society and the state from the destructive effects of CBRN weapons.

Key Words/Phrases: Terrorism, security system, law enforcement, forensics

89. CBRN TERRORISM AND BOSNIA AND HERZEGOVINA

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The authors analyze specifics of the social and political environment and identify conditions that intensify use of terrorism as a weapon for used in conquest of political ground. There are several areas that, according to the authors, it is necessary to direct special attention to: dominant political processes, identity of the social groups, poverty, various forms of crime trends, ideology, media receptivity and critical distance of public opinion, as well as the availability of CBRN materials. By establishing this model it is possible to isolate two reference objects/subjects. On one side – the state, and the other individual/social group/nation. Representing the hypothesis that use of CBRN materials as a part of terrorist attacks is possible in Bosnia and Herzegovina, this paper analyzes the status and possibilities of intensified use of CBRN weapons to achieve political objectives by different entities who are ready for this kind of political struggle.

Key Words/Phrases: terrorism, CBRN, security, political violence

90. FRONTIERS OF SHORT AND MID-TERM CIVIL-MILITARY COOPERATION IN CBRN DEFENCE

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Prevention is the new priority, a buzz-word. New tasks will come, new cross-cutting concepts and missions have to be experimented and approved, new questions have already been addressed, new dimensions of CBRN defence are to be explored.

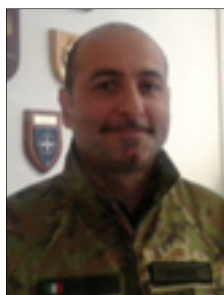
What will be then the "possible futures" of CBRN Defence. Today is hard to identify clear solutions, what we can certainly do is to pinpoint some new "trends". In fact what is true for each NATO Country today is the fact that economies are drastically shrinking, Nations are not investing on their own in Defence related R&D projects. Innovation runs in the direction of "pooling and sharing" of resources, of "smart" solutions and "areas of collaborative work. Armies are reducing, un-manned solutions will be the future, robotization a priority. In this perspective Defence Forces, which detained the CBRN defence competence for more than 60 years, have to share the

future with Civil authorities, they have to rely on each other in the view to cover the "gap" of prevention as soon as possible. Prevention, as a matter of fact, is less expensive in terms of manpower, but the level of Information Management and expertise necessary to cover this task will be much higher than today.

Networking will be the password to coordinate common efforts in the next 10 years and, if the trends will be confirmed, what will happen in 2020 years will be a real "hand over" of Defence responsibilities. The armies will be the most little and technologically advanced party of a "Security" network made of civilian capabilities. However we don't want to sail too far in the "ocean" of CBRN prevention future(s).

We want just to mention some items which will be developed in the next 10-15 years: Enhanced Interaction, coordination and interconnection of CBRN military and civilian capabilities in "WMD and CBRN preventing matters"; CBRN in support of Critical Infrastructures Protection; CBRN Defence in Defence Against Terrorism; Civil-Military interaction in developing new CBRN related capabilities; Forensic SIBCRA and coordination site exploitation forces as EOD, Special forces, Security forces, Scientific police; Cooperation with Special Forces in preventive actions in particular in WMD-Disablement; CBRN W&R (and M&S) will support Ballistic Missile Defence; CBRN M&S will support Defence Against Terrorism scenarios in support of civil Decision Making process; New Information Management "tools" as Functional Service; It will be established a NATO Reach Back and Fusion Element as "flywheel" of knowledge for Military and Civilian CBRN defence advice and support; New Courses of Action have to be considered while Planning NATO Missions; Progressive robotization and automatization of CBRN Detection and Identification technologies (CBRN Stand-off detection and Identification); Development of Biological detection capabilities; CBRN innovative hardening and decontamination means; CBRN Defence land and Maritime Interdiction Operations.

Just to mention some of the possible futures of CBRN Defence in 2020s.



Lieutenant Colonel Romeo Tomassetti was born in Rome in 1972. He attended the Military Academy in Modena in 1991-1993 and the Officers' School in Torino in 1993-1996. In 1996 he was moved to the Italian CBRN Defence Army Regiment in Civitavecchia where he served as Platoon Leader, Company Commander and Staff Officer. Deployed in Kosovo and Afghanistan as CBRN Unit

Commander or Staff Officer several times. He was moved to the Italian JCBRN School in Rieti in 2003 where he served as R&T Section Chief, CBRN Defence Teacher and courses manager as well as national delegate in many NATO and EU CBRN Defence related working groups and panels. In 2010, after the Joint Staff College course, he was moved at the NATO JCBRN Defence Centre of Excellence as Force Planning and Capability Development Section Chief & Manager.

91. HEAVY METALS IN THE AQUATIC ENVIRONMENT: FISH AND THEIR PARASITES AS SENTINEL ORGANISMS FOR POLLUTION

Franz Jirsa

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Pollutants in the aquatic environment show characteristic accumulation behavior, due to distinct physico-chemical properties of both, the pollutants and the compartments they occur in. Fish have been recognized as good bio-indicators, as they accumulate pollutants, such as heavy metals, to a high degree and therefore reflect the situation of pollution in the system integrated over an extended period of time. Especially non essential elements as lead, cadmium and mercury show a high tendency to accumulate in fish, due to lower excretion rates compared to uptake rates. In addition some intestinal parasites of fish, e.g. acanthocephalans and cestodes are able to accumulate pollutants to a much higher degree than their fish hosts, in a much shorter period of time and therefore give additional information on the duration of pollution. Examples from central european investigations demonstrate the high sensitivity of the fish-parasite system for detection of short time or longtime contamination in rivers.

Key Words/Phrases: heavy metals, bio-accumulation, fish, parasites



Franz Jirsa – Working career: 1981 – 1997: Opera- and Operetta singer (amongst others 10 years with the Volksoper Wien) since 1988 partner and assistant manager at the ticket & travel agency Franz Jirsa GesmbH, 1080 Wien, Lerchenfelderstrasse 12 since 2004 at the Institute of Inorganic Chemistry, University of Vienna since 2004 teaching environmental chemistry 2007 -

2009 post doc position (environmental chemistry, humic substances in aquatic systems, heavy metals in the environment). Since 2008: teaching ecotoxicology. Since 2009: Univ. Assistant : same topics as above. Awards: 2004: "Erster Österreichischer Nationalpark Forschungspreis" for the masterthesis "Die proto- und metazoische Parasitenfauna bei Chondrostoma nasus L. und Leuciscus cephalus L. zweier Habitate in Niederösterreich und die physikalisch – chemische Analyse der Gewässer".

92. DEFENSE THREAT REDUCTION AGENCY ROBOTICS AND AUTOMATION INITIATIVES

LTC Scott Sinkular

US European Command's nuclear weapon accident program
USA

The Defense Threat Reduction Agency (DTRA) delivers advanced detection technologies to support the combatant commands, services and other customers. Improvement to capabilities includes expanding the range of nuclear detection from several yards to stand-off distances in order to locate, track or interdict nuclear weapons and materials in the hands of adversaries.

DTRA is developing systems to conduct radiation reconnaissance and sampling missions after a nuclear detonation. This presentation will provide an overview of the ground – based Advanced Ground Sample Platform and the aircraft pod – mounted Harvester systems.

93. ELIAVA INSTITUTE EXPERIENCE IN BIOSAFETY/BIOSECURITY AND NEW PERSPECTIVES IN IMPLEMENTATION OF INTERNATIONAL STANDARDS AND REGULATIONS

Mzia Kutateladze

G. Eliava Institute of Bacteriophages
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G. Eliava Institute is a world-known Institution working on pathogenic and conditionally pathogenic bacterial strains. During the Soviet period the Eliava Institute played an important role in elaboration of the novel biological preparations and manufacturing of the products against almost all major bacterial and viral diseases, such as anthrax, rubies, tuberculosis, brucellosis, salmonellosis, dysentery, etc. The Eliava was the leading organization in Bacteriophage research, production of phage preparations and their practical application. During the Soviet time, the Institute was operated under the instructions and regulations on Biosafety provided by the All-Union Ministry of Healthcare. After the breakdown of the Soviet system, the Institute encountered numerous types of problems, but the management of the Institute carried out necessary steps to protect the personnel and to regulate the microbiological and other activities.

Currently, new infectious agents and diseases have emerged. Work with infectious agents in public and private research, clinical and diagnostic laboratories, and in animal care facilities has expanded. For these reasons organizations and laboratory directors are compelled to evaluate and ensure the effectiveness of their biosafety programs, the proficiency of their workers, as well as the capability of equipment, facilities, and management practices to provide containment and security of microbiological agents. Similarly, individual workers who handle pathogenic microorganisms must understand the containment conditions under which infectious agents can be safely manipulated and secured. Application of this knowledge and the use of appropriate techniques and equipment will enable the microbiological and

biomedical community to prevent personal, laboratory and environmental exposure to potentially infectious agents or biohazards. Scientific council of the G. Eliava Institute of Bacteriophages, Microbiology and Virology updated the Institutional Biosafety Committee (IBC) based on the newly approved International manual on Biosafety/Biosecurity – CWA 15793 (Laboratory biorisk management standard). The Institute established a Biosafety/Security policy to regulate the manipulation of biological and/or chemical samples with minimal accident risk and occupational safety. Biosafety manual of the Institute will be updated on the base of new Laboratory biorisk management standard CWA 15793.

Key Words/Phrases: Eliava Institute, Biosafety/Biosecurity, International manual CWA 15793



Dr. Mzia Kutateladze is a chief of the Scientific Council and head of the Laboratory of Molecular Biology of the Eliava Institute. She is chief biosafety officer at the Institute. She is also included in the biosafety committee of the R. Lugar Center of Public Health Research (CPHR). Dr. Kutateladze currently is managing several collaborative research projects funded by various International

funding agencies.

94. FOREIGN CONSEQUENCE MANAGEMENT

Lee Charles B. TSB – CIV
DTRA
USA

Foreign Consequence Management (FCM) is defined as "United States Government (USG) activity that assists friends and allies in responding to the effects from an intentional or accidental chemical, biological, radiological, or nuclear (CBRN) incident on foreign territory in order to maximize preservation of life. The briefing will discuss what is, and what is not, considered FCM as well as the principles of FCM. It will also describe the FCM request process, and provide an overview of the U.S. Defense Threat Reduction Agency (DTRA) and its role in FCM.

Mr. Lee will provide a briefing on Foreign Consequence Management which is defined as "United States Government (USG) activity that assists friends and allies in responding to the effects from an intentional or accidental chemical, biological, radiological, or nuclear (CBRN) incident on foreign territory in order to maximize preservation of life.

The briefing will discuss what is, and what is not, considered FCM as well as the tenets of FCM. It will also describe the FCM request process, the various phases of FCM, and provide an overview of the U.S. Defense Threat Reduction Agency (DTRA) and its role in FCM.

95. THE SPECTER OF CBRN INCIDENT WITHIN THE CIVILIAN POPULACE

Colonel Randy L. Smith

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Despite the limited number of fatalities directly attributed to CBRN attacks against the civilian populace of the community of nations, strategic policy makers and ordinary citizens alike remain fearful of the potential consequences of such an attack. Certainly some of this heightened anxiety can be credited to the devastating potential of the aptly named Weapons of Mass Destruction (WMD), but that alone does not explain the pre-occupation with preparedness for this type of event. Whether our determination to prepare for what we consider the inevitable CBRN incident stems from the psychological impact of a generation that lived with the real possibility of nuclear war and its subsequent probability of the destruction of much of human civilization or today's increasing fear that radical terrorist organizations will obtain and use such weapons, each of our societies seeks ever more reliable solutions to this problem. Additionally, the virtually unlimited availability of information brought about by mass media and the internet revolutions ensure that nearly every member of modern society has at least a passing knowledge of or a direct recollection of just how horrific and damaging these CBRN incidents can be. This only furthers our interest in preparing ourselves so that we might avoid a similar fate. Our discussion will focus on the four main methods that CBRN manifests itself into our lives: A pre-meditated CBRN attack, the accidental release of CBRN material caused by human error, the unavoidable natural disaster that produces a CBRN incident as an unforeseen by-product of the destruction, and the appearance of a contagious disease or pandemic that affects a large portion of the population. In any case it is not what causes the incident that matters, but how we as a society deal with it. In view of this, it is also important to note that there has been a dramatic shift in philosophy from that which we experienced during the Cold War. No longer is the civilian populace simply viewed as collateral damage to our potential adversaries. In fact the most likely scenarios all involve the civilian populace as the primary target. For this reason our governments realized that there must be a greater coordination among the military and those responsible for homeland security in order to protect the less protected but increasingly more targeted portion of our societies; our civilian populations.

Colonel Smith received a four year ROTC scholarship after high school and is a 1987 graduate of the Colorado School of Mines where he earned a bachelor's degree in Chemical and Petroleum Refining Engineering. He was branched as a Chemical officer and has served in that capacity for more than 25 years. He holds a master's degree in Procurement and Acquisition Management from Webster University and a Masters of Strategic Studies from the U.S. Army War College.

He is a graduate of the U.S. Army Airborne School, Chemical Officer Basic and Advanced Courses at Fort McClellan, AL, Advanced Military Transition Team Training, Joint Combined Warfighting School, Joint Planning Course, Combat Developers Course, Integrated Logistics Support Course and Integrated Logistics Support and Materiel Acquisition Course. In addition he is a graduate of the Combined Armed Services Staff School, Command and General Staff College and the U.S. Army War College. He has held a variety of technical and tactical assignments to include: Battalion Chemical Officer, Neu Ulm Germany; Battalion Intelligence and Security Officer, Neu Ulm Germany; Nuclear Surety Officer, Neu Ulm Germany; Instructor and Doctrine Writer, US Army Chemical School; Senior Materiel Development Officer for Biological Defense Systems, US Army Chemical School; Assistant Division Chemical Officer, 4th ID, Fort Carson, CO; DIVARTY Chemical Officer, 4th ID, DIVARTY, Fort Carson, CO; Mechanized Smoke Company Commander, 172nd Chemical Co, Fort Carson, CO; Assistant Professor of Military Science, Furman University, Greenville, SC; Chief of Division Operations, 1st AD, Tuzla Bosnia; Chief Passive Defense, 32d Army Air and Missile Defense Command Brigade Chemical Officer and Personnel Officer, 35th Air Defense Artillery Brigade, Fort Bliss, TX; Battalion Executive Officer, 2-1 Air Defense Artillery Battalion, Fort Bliss, TX & Kuwait; Operations Officer, Mobile Command and Control, US Space Command and US Northern Command, Peterson AFB, CO; Executive Officer to the J3, US Northern Command, Peterson AFB, CO; Executive Officer to the Deputy Commander, US Northern Command, Peterson AFB, CO; Battalion Commander, Kansas City Recruiting Battalion, Kansas City, MO; Deputy Chief, 1st National Police Division Transition Team, Baghdad, Iraq; Chief Observer Controller, Operations Group Delta, US Army Battle Command Training Program, Fort Leavenworth, KS; Chief of the Operations Group, Operations Group Delta, US Army Battle Command Training Program, Fort Leavenworth, KS.

96. RESEARCH ON THE SAFETY ENGINEERING STUDENTS' PERCEPTION OF THE INFLUENCE OF CYBER TERRORISM IN THE FIELD OF INTEGRAL SAFETY

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The application of information-communication technologies is the foundation of operations in almost every contemporary business system, as it enables the opening of an entirely new virtual dimension and makes the real boundaries disappear. It is precisely this blend of the virtual and the real that presents the new battlefield, where real injuries and destruction take place on many levels, with physical, psychological, material, economic, sociological, and ecological levels among them.

It has become hard or even impossible to run a business without the Internet, and the Internet access has become at the same time increasingly simple and available and increasingly less protected and safe. Although businesspeople of today in principle do understand the risks and dangers that may appear as the consequence of system penetration, only a small number of persons can differentiate between computer crime and cyber terrorism.

The system penetration is not an act of terrorism in case the system does not manage something that may cause harm. All forms of the illegal use of computer and information-communication technologies to cause harm to persons and material goods for violent objectives is referred to as cyber-terrorism. Cyber terrorism can be considered a global world threat as the Internet erases spatial distance and boundaries. Computer abuse can be computer crime that is different from cyber terrorism.

Recognizing the risks and preventing cyber terrorism are big, though often completely unknown issues, as the history frequently witnessed. Persons committing this type of crime are highly educated and understand the possibilities of attacking various systems well, which at the same time increases the risks and complicates defence and protection.

This paper shows the results of the safety engineering students' perception of the influence of cyber terrorism in the field of integral safety. The results will serve in the formation of additional teaching units related to this field in the courses Computer Science and Security of Information Systems.

Key Words/Phrases: research, perception, cyber terrorism, influence, integral safety.



Antun Matija Filipović completed the professional undergraduate and the specialist graduate study of safety at the College of Applied Sciences in Safety in Zagreb, with the title of Professional Specialist Engineer in Safety and Protection, and the E-learning Academy of the Croatian Academic and Research Network. He has extended his formal education by numerous trainings

in the fields of project management, advanced information systems and technologies, and graphic design. He is the head of the EU-funded projects. From 1999 to 2007 he worked for the Croatian Radio-Television, The City Housing and Public Utility Services Ltd., Information Systems and

Information Technologies Support Agency Ltd., Zagreb Holding Ltd., and Zagreb Roads Ltd., on jobs connected with research and development and engineering jobs in the field of advanced information systems and technologies. Since 2008 he has been employed at the College of Applied Sciences in Safety in Zagreb as the secretary – head project manager of the Centre for Electronic Education, the coordinator for ECTS credit unit system, and an assistant on the Computer Science course on the professional undergraduate study of safety. He is the member of the National Council for Safety at Work of the Republic of Croatia – an advisory body to the Croatian Government, the secretary of the Croatian Society of Safety Engineers, and the President of the Organizational Committee of the International Scientific and Professional Conference Management and Safety. His research interests are in the application of contemporary information-communication technologies in the fields of education and integral safety. He has published two books, six scientific papers, three presentations at scientific congresses, and four expert articles, and edited four conference proceedings. He is an associate of several journals and other publications.



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No.	Name	Title of presentation
70.	Nandway Chitumbo	USE OF ROBOTICS IN RELATION TO FUKUSHIMA DECOMMISSIONING
71.	Rolf Dieter Schraft	USE OF ROBOTICS IN INDUSTRY
72.	Rob Buckingham	USE OF ROBOTICS SPECIFICALLY IN THE NUCLEAR ENERGY SECTOR
73.	Trond Michael Andersen	USE OF ROBOTICS SPECIFICALLY IN THE OIL & GAS SECTOR
74.	Konstantin P. Darmaniyan Darko Dužanec	MULTIFUNCTIONAL ROBOTIC SYSTEM FOR CBRNE APPLICATION
75.	Konstantin P. Darmaniyan	ROBOTICS APPLICATION IN MILITARY, POLICE AND CIVIL DEFENSE
76.	Giuliano Franceschi	ROBOTICS SYSTEMS IN DEFENSE AGAINST CBRN THREATS / UGVs FOR CBRNE OPERATIONS
77.	Edita Vujasinović	PROTECTIVE CLOTHING RECYCLABILITY
78.	Sandra Bischof	NANO-FUNCTIONALIZATION OF TEXTILES: PROTECTION AND HEALTH SAFETY
79.	Zvonko Dragčević Zvonko Orehovec	NEW APPROACHES FOR PROTECTIVE FIREFIGHTERS' CLOTHING – CB PROTECTION
80.	Giovanni Galatolo	MAG INTERNATIONAL
81.	Peter Lejeune	COUNTER PROLIFERATION
82.	Damir Piršić	NEW EU REGULATION ON THE MARKETING AND USE OF EXPLOSIVES PRECURSORS IN FUNCTION OF PROTECTION FROM MISUSE AND ILLICIT MANUFACTURE OF EXPLOSIVES
83.	Martin Kunes	ACETYLCHOLINESTERASE REACTIVATORS AND SURFACTANTS WITH A PROMISING APPLICATION POTENTIAL
84.	Darko Vinicki	MODERN IT TOOLS AND EQUIPMENT TO INCREASE RELIABLE INFORMATION ON CHEMICAL ACCIDENTS
85.	Dan Kaszeta	INITIAL ASSESSMENT OF CBRN/HAZMAT INCIDENTS: THE FIRST HOUR
86.	Ana Mikačić Ranko Britvić Petar Vitas	IF REACT
87.	David Trudil	HIGH SECURITY ACCESS CONTROL

No.	Name	Title of presentation
88.	Nebojša Bojanić Nedžad Korajlić	CAPACITIES OF BOSNIA AND HERZEGOVINA IN THE FIGHT AGAINST CBRN TERRORISM
89.	Goran Kovačević Haris Halilović	CBRN TERRORISM AND BOSNIA AND HERZEGOVINA
90.	Romeo Tomassetti	FRONTIERS OF SHORT AND MID-TERM CIVIL-MILITARY COOPERATION IN CBRN DEFENCE
91.	Franz Jirsa	HEAVY METALS IN THE AQUATIC ENVIRONMENT: FISH AND THEIR PARASITES AS SENTINEL ORGANISMS FOR POLLUTION
92.	Scott Sinkular	DEFENSE THREAT REDUCTION AGENCY ROBOTICS AND AUTOMATION INITIATIVES
93.	Mzia Kutateladze	ELIAVA INSTITUTE EXPERIENCE IN BIOSAFETY/BIOSECURITY AND NEW PERSPECTIVES IN IMPLEMENTATION OF INTERNATIONAL STANDARDS AND REGULATIONS
94.	Lee Charles B.	FOREIGN CONSEQUENCE MANAGEMENT
95.	Randy L. Smith	THE SPECTER OF CBRN INCIDENT WITHIN THE CIVILIAN POPULACE
96.	Antun Matija Filipović Davorin Kacian Dino Pleić	RESEARCH ON THE SAFETY ENGINEERING STUDENTS' PERCEPTION OF THE INFLUENCE OF CYBER TERRORISM IN THE FIELD OF INTEGRAL SAFETY



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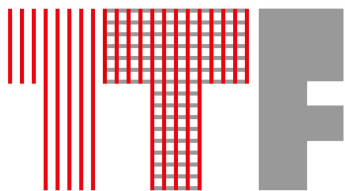
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the title acquired at completion is **professional bachelor of safety engineering and protection, bacc. ing. sec.**,
with 180 ECTS credit units at the first level
of the Bologna higher education system

SPECIALIST GRADUATE PROFESSIONAL STUDY OF SAFETY

the title acquired at completion is **professional specialist of safety engineering and protection, professional spec. ing. sec.**,
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- textile mechanical
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Organizational structures:

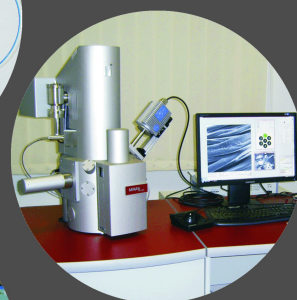
- Centre for Development and Transfer of Textile and Clothing Technologies and Fashion Design (CTD)
- Textile Science Research Centre (TSRC)
- Lifelong Learning Center of Faculty of Textile Technology (COBRA)
- International Relations Office (IRO)
- Service for Textile European Projects (STEP)
- Office for Publishing Activities (UZID)

Textile Science Research Centre (TSRC)

Textile Science Research Center (TSRC) was established in October 2008. It is hosted by the University of Zagreb, Faculty of Textile Technology. TSRC was established with the aim of becoming class textile and clothing R&D entity and developing industrial growth.

TSRC's Scientific Council represents the research nucleus in the field of textile & clothing capable to network within European Research Area (ERA). Following good practice of our European Technology Platform (ETP) and for the Future of Textiles and Clothing (FTC) and Lead Market Initiative (LMI) emphasis will be laid on the most relevant EU research topics.

<http://www.ts-rc.eu>



Centre for Development and Transfer of Textile and Clothing Technologies and Fashion Design

The Centre was established in 2004 with the aim of the interconnection of science and knowledge with economy. Scientific potential, results of scientific investigations, new patented products or methods and conceptual designer solutions at the Faculty should be used to solve development, manufacturing and technological problems of economy, permanent further education of employees, sophisticated investigations and measurements for the needs of customers, in particular of small and medium-sized entrepreneurship.

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Osdir

Observatory on Security and CBRNe Defence

What is OSDIFE?

OSDIFE is the acronym for **O**bservatory on **S**ecurity and **D**efence

It is the first Italian Observatory dedicated to the knowledge of the risk with particular attention to the Security, Defence and CBRNe.

OSDIFE Observatory is an independent place for study, monitoring, analyzing and scientific dissemination.

It conducts researches about the territorial risk, terrorism, natural and anthropic risks, environmental risk and critical infrastructure security.

The Observatory also produces and disseminates reports and information and realizes meetings, symposia and workshops which aim is both to provide useful tools for decision makers and to encourage the adoption of best practices, strategies and actions for risks reduction.

Then, the Observatory is also strongly committed in education and training as tools to develop and promote, at every level, knowledge and awareness of territorial risk in all its different dimensions.

For all these activities OSDIFE has a wide national and international network of researchers, experts, specialists, public and private organizations, industries and companies engaged every day in security, defence and CBRNe risk.

Activities

To achieve its objectives, the Observatory joins, supports and collaborates with agencies, organizations and structures having similar purposes to OSDIFE's goals.

The main activities of the Observatory are:

- Studies, researches and projects on territorial security, on conventional, unconventional, hybrid, asymmetric and CBRNe threats and on security and defence technologies;
- Studies and analysis of risk profile to plan activities for security planning, contingency planning and crisis management in public and private sectors;
- Promotion of scientific research;
- Promotion and implementation of meetings for public and private, national and international organizations in order to create a synergic and cooperative network and to develop new initiatives and activities in the sector of security and defence;
- Promotion and organization of educational and training courses;
- Performing all scientific activities necessary to pursue the institutional goals.



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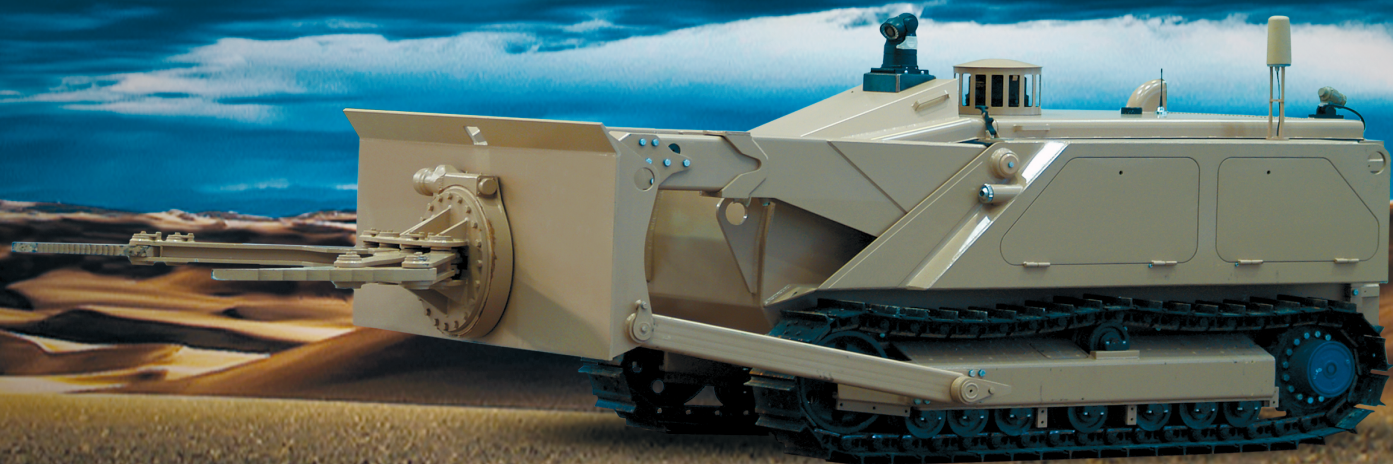
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Non-Conventional Threat Events 2013

June

NCT CBRNe Israel, 4-6 June 2013, Tel Aviv

Asia's number one CBRNe and C-IED event is joining the Israeli Defence Exhibition (ISDEF) for the first international CBRNe and C-IED Conference and Exhibition in Israel.

NCT Forum on Food Supply Chain Security, Brussels

This inaugural forum focuses on security issues in the European food supply chain. The one-day forum will address the threat of CBRN contingencies within the European food supply chain, best practices and lessons learned from past food safety incidents.

September

NCT CBRNe Asia, 24-27 September 2013, Kuala Lumpur

Asia's premier CBRNe conference, exhibition and demonstration, The Non-Conventional Threat CBRNe Asia, expands its scope by including focused interactive training workshops and the NCT CBRNe Awards.

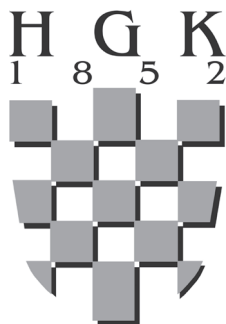
November

NCT C-IED Asia, 12-15 November 2013, Bangkok

The second edition of Asia's leading Counter IED and EOD event, the Non-Conventional Threat C- IED Asia. The event includes a conference, exhibition, live capability demonstration day, and a day of interactive training-workshops.



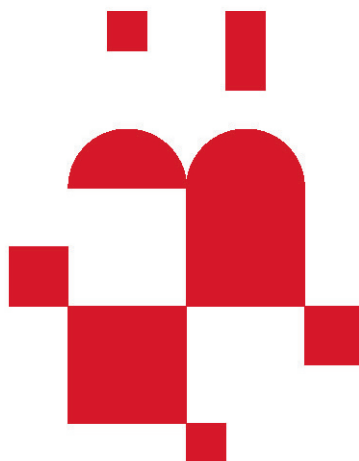
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VINA CROATIA
vina mosaica



Fire Fighting Sector



On the national level this Sector monitors the situation and events in the field of fire protection, drafts strategies and tasks, trains and equips fire brigades as well as other participants in fire fighting activities.

This Sector directly manages the national Intervention Units and coordinates the activities of all participants in fire fighting operations. When a fire incident spreads over two or more Counties – this Sector commands and coordinates the response; it also coordinates the more demanding operations that involve both land and air forces.

Fire Fighting and Protection and Rescue School

The Fire Fighting and Protection and Rescue School also operates within the central administration as one of its Sectors. The School plans, prepares, conducts and monitors the schooling, training and advanced training of professional firemen; organised protection and rescue forces (command HQ's, unit commanders, shelter managers and civil protection commissioners). The School also conducts courses for civil servants and employees in the local administration as well as employees of legal persons in the field of protection and rescue.



Mission

To constitute and maintain a modern system of protection and rescue in the Republic of Croatia, which will be able to respond with all available resources to all needs for the protection of people, assets and environment in events of disasters, accidents and other needs of a modern society, and if necessary, extend or obtain help from other countries in the emergency situations.



Primary Business Address

Nehajska 5, 10000 Zagreb

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REPUBLIC OF CROATIA

NATIONAL PROTECTION AND RESCUE DIRECTORATE



Leading organization for the protection and rescue of people, assets and environment in the Republic of Croatia, in harmony with the needs of a modern society.

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REPUBLIC OF CROATIA



The Republic of Croatia, as a European and Mediterranean country, extends from the furthest eastern edges of the Alps in the north-west to the Pannonian lowlands and the banks of the Danube in the east; its central region is covered by the Dinar mountain range, and its southern parts extend to the coast of the Adriatic Sea. The Republic of Croatia has approximately 4 500 000 inhabitants and it's divided into 20 counties + the City of Zagreb as its capital.

Basic tasks

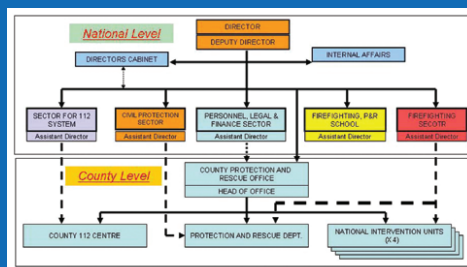
The basic tasks of the National Protection and Rescue Directorate are stipulated by the Law on protection and rescue. The most important tasks are risk and vulnerability assessment, drafting measures aimed at preventing of crises and accidents, ensuring that these measures are implemented, and effective emergency management in case of major disasters.

Organization

The National Protection and Rescue Directorate is divided into organizational entities. The central national administration consists of the Directors Cabinet and the Internal Affairs Department as well as five sectors:

Civil Protection Sector,
Fire Fighting Sector,
Sector for I12 System,
Fire Fighting and Protection and Rescue School and
Personnel, Legal and Finance Sector.

The functionality of the Directorate is ensured through its territorial organization i.e. each County has a Protection and Rescue Office consisting of a Protection and Rescue Department and a County I12 centre, while Offices along the coast also have National Intervention Units.



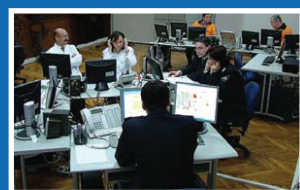
Civil Protection Sector

The Civil Protection Sector directly manages civil protection forces during a disaster or larger accident it conducts mobilisation and coordinates other protection and rescue operational forces engaged in disaster response activities. The Sector also conducts prevention activities i.e. drafting SOP's, risk assessments and response plans. It monitors the situation and events in the field of civil protection, monitors the construction and methods for utilising shelters, recommends and organises education/training measures for citizens.



Sector for I12 System

The Operational communication duty services within this Sector operate 24/7 (National and County I12 Centres) and collect and process information, notifications and data. They are tasked with informing the population, legal persons, national administration, rescue services, civil protection officers as well as others regarding all possible threats and their consequences. This service also keeps logs on the situation of events, dangers, accidents and disasters; it prepares the public alert system and coordinates the transferral of commands and decisions.



National Protection and Rescue Directorate



The National Protection and Rescue Directorate is an independent, professional and administrative organisation, tasked with preparing plans and managing operational forces as well as co-ordinating the activities of all participants in the protection and rescue system.

Company **PROTEKTA d.o.o.**, Varaždin is a company for production and trade with devices, products and equipment for defence and protection from nuclear, chemical and biological (NBC) weapons in the narrow sense and for defence and protection from nuclear, radiological, chemical and biological threats and explosives in a wider sense for the needs of civil sector (industry, environment protection, security companies, scientific institutions, medical institutions...) and defence – safety and protective sector (military, police, fire brigades, civil protection and other subjects in rescue and protection system and specialized teams, units and institutions...).

Company **PROTEKTA:**

- ♦ is officially registered for export and import of Military goods
- ♦ has a certificate for implementation of Internal Compliance Program (ICP) which was sponsored by U.S. Department of State Export Control and Related Border Security (EXBS) Program
- ♦ has a Facility Security Clearance Certificate (FSCC) for a NATO CONFIDENTIAL clearance and possesses storage capabilities approved for the safeguarding of classified information up to NATO CONFIDENTIAL.

Organization and activities of company **PROTEKTA** provide complete information and service to our potential and future customers, but also to all well meaning experts and common citizens related to material-technical means, equipment and devices which are used in defence and protection against weapons for mass destruction (WMD), CBRN weapons as well as all other radiological, chemical and biological agents which are a threat to modern community.

► CUSTOMER CONSULTATION • PRODUCT PRESENTATION • SYSTEM INTEGRATION • CUSTOMIZATION • EQUIPMENT UPGRADE • EDUCATION • SERVICE, MAINTENANCE AND REPAIR OF CBRN PRODUCTS/EQUIPMENT ◀

SALE AND SUPPLY:

❖ **Equipment for detection and identification**

Chemical detection
Biological detection
Radiological detection
Mobile laboratories
NBC reconnaissance vehicles
Integrated NBC systems for warning and reporting

❖ **Systems for CBRN, Gas and HazMat simulation**

❖ **Tactical and non-tactical weather monitoring systems**

❖ **Protective equipment**

Personal protection
Decontamination equipment
Shelters
Testing equipment

❖ **Medical equipment (medical protection against CBRN threats)**

❖ **IT equipment and software (CBRN warning and reporting)**

❖ **Disposal, management and neutralization of explosive devices**

DEVELOPMENT AND PRODUCTION:

❖ **Protective Coat – PONCHO „C“**

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a) for body protection against chemical contamination made by chemical agent's drops and to prevent the NBC sedimentation on the clothing, weapons and equipment

b) when not used as protection against chemical agent's drops it can be used as protection against various weather conditions e.g. rain, snow, wind. Because of its good mechanical properties it can be used numerous times for training purposes

❖ **Radiological dosimetry system** (still in development), which consists from improved dosimeter developed by Ruđer Bošković Institute and optoelectronic dosimeter reader which is completely designed by our employees and professional associates.



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SANIRANJE ZAGAĐENIH PODRUČJA

Bez obzira na veličinu projekta naše in-situ tehnike omogućavaju brzo, sigurno i financijski efikasno rješenje problema. Naša ekspertiza proteže se na izvođenje sanacije zagađenih područja različitim tehnikama uključujući:

- termalnu desorpciju
- bio-remedijaciju
- fizikalno - kemijsku obradu
- solidifikaciju / stabilizaciju.

Naš napredni in-situ pristup saniranju zagađenog područja omogućava:

- kraće vrijeme sanacije
- zajamčeno dostizanje traženih rezultata
- povećanje vrijednosti nekretnine
- dugoročnu usklađenost sa zakonskim propisima.

Radi kvalitetnije pripreme projekta za naše klijente izrađujemo i:

- procjene postojećeg stanja
- procjene rizika
- izradu plana uzorkovanja i monitoringa zagađenog područja
- odabir prikladne tehnologije saniranja zagađenog područja
- studije utjecaja na okoliš saniranja postojećeg zagađenja
- monitoring zraka, tla i podzemnih voda.



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IFREACT, Improved First Responder Ensembles Against CBRN Terrorism



CSCM Congress Timetable

Saturday 13 April 2013	Sunday 14 April 2013	Monday 15 April 2013	Tuesday 16 April 2013	Wednesday 17 April 2013	Thursday 18 April 2013	Friday 19 April 2013	Saturday 20 April 2013
Workshop on the Defense and Protection of Cities from CBRN Threats 09:00-12:30 Break 10:30-11:00	Workshop on the Defense and Protection of Cities from CBRN Threats 09:00-14:30 Break 10:15-11:00	Opening Ceremony 09:00-10:00 Coffee Break 10:00-10:30 Keynote Address 10:30-12:30 Introduction of Sectors 12:30-13:00	Introduction and Keynote Speech 08:30-09:00 Coffee Break 09:00-09:30 Session 3 09:30-12:00	Session 5 08:30-10:30 Coffee Break 10:30-11:00 Session 6 11:00-13:00	Session 9 08:30-10:30 Coffee Break 10:30-11:20 Session 10 11:20-12:40	Session 13 The Summary of Sessions by Sector Chairs/Co-Chairs 09:00-10:30 The CSCM Meetings: best way forward Closing Remarks and the Congress Adjourns 10:30-11:00	Transfers to airport 05:00
Lunch 12:30-14:00	Lunch 13:00-14:30	Lunch 13:00-14:00	Lunch 12:00-13:00	Lunch 13:00-14:00	Lunch 13:00-14:00	Lunch 12:00-13:00	—
Workshop on the Defense and Protection of Cities from CBRN Threats 14:00-16:00 Free time 17:30	CSCM Registration 13:00-18:30 Meeting of Congress Sector/ Session Chairs/ Co-Chairs 17:00-17:30 Congress Welcome Reception Hotel Croatia 19:30-21:30	Session 1 14:00-16:00 Coffee Break 16:00-16:30 Session 2 16:30-19:00 Free time 19:00	Session 4 13:00-14:30 Congress Exercise 15:00-16:00 Congress Dinner Hotel Croatia terrace 19:00-21:30	Session 7 14:00-16:00 Coffee Break 16:00-16:30 Session 8 16:30-18:30 Free time 18:30	Session 11 14:00-16:00 Coffee Break 16:00-16:30 Session 12 16:30-18:00 Free time 18:00	Free time 13:00	