

nd International Symposium on Development of CBRN Defence Capabilities

2012: European Perspectives in an International Environment



Conference Magazine 2012







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GDS

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Safe. For many years, Futuretech has been developing, testing and supplying tailormade solutions for the effective defence of NBC attacks in urban and natural environments. The truckmounted TEP 90 in Germany, the DECOCONTAIN 3000 GDS full decontamination system in Sweden, the variable MOSDM system in Belgium, the rapidly deployable JSTDS Small Scale module in the USA, or the biologically degradable GDS, RDS and BDS decontamination agents – these are all references that speak for themselves, and in which the protection of people and the environment is the focal point.

Decon Shuttle





Preamble of the GE Mol



Ladies and gentlemen,

CBRN-risks occur in military scenarios as well as in civil scenarios ranging from man-made disasters like terrorist attacks or industrial accidents to natural hazards like pandemics or natural disasters with a cascading effect on industry or critical infrastructures. They are comparatively low-probability risks. But in case of their occurance they may lead to considerable damage and considerable fear and uncertainty among the general public.

This makes CBRN defence one of the two top priorities of the German Federal Ministry of the Interior in civil protection. The second priority is raising our medical capability to cope with a rapid increase of the number of victims. This capability is more of a general nature looking at response capabilities from an all-hazard perspective, but it might be an important capability in CBRN-scenarios as well. Both capabilities are meant to serve civil protection at federal level in military situations on the one hand and civil protection at federal states' level in civil disaster situations on the other hand.

CBRN-scenarios are highly complex and require an efficient and well-prepared teamwork of many stakeholders from different disciplines and different levels of responsibility. Therefore starting cooperation, exchange of information, methods and best practice even before an incident is vital. National and international cooperation will create synergies not only in disaster response but also in prevention, security research and fight against terrorism.

This second "International Symposium on Development of CBRN Defence Capabilities" provides a platform for national and international exchange on CBRN defence and I hope it will provide all participants with a lot of useful input and information.

Dr. Klaus-Georg Meyer-Teschendorf Head of Unit Civil Protection German Federal Ministry of the Interior Federal Ministry of the Interior



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an interantional Environment

Preamble of the GE MoD



Ladies and gentlemen,

The mission of CBRN Defence is to cope with any potentially evolving CBRN threat. This threat can put at risk military forces, governmental and non-governmental organizations as well as the civilian population throughout a specific theatre of operation and beyond. Homeland security could be affected as well. A comprehensive strategy that provides solutions to counter

this threat by synchronizing political, economical and military efforts fosters the mutual development of the necessary civilian and military capabilities. CBRN Defence related science and technology also play a substantial role as they provide the technical solutions required to increase the effectiveness of CBRN Defence capabilities.

The objective of this second "International Symposium on Development of CBRN Defence Capabilities" is to contribute to the key process of capability development by presenting in a wide range of interesting topics in a comprehensive manner. These are national and multinational CBRN security policy aspects, challenges to civil and military defence against CBRN threats in a multinational environment, various national approaches as well as the latest achievements in science and technology. This symposium provides a platform for mutual information and expert-level discussion throughout the international CBRN community. It hopefully will result in a substantial amount of valuable take away for all the nume-rous participants.

Colonel (GS) Dieter Georg Jaksik Specialist Military Tasks: Support and Routine-Duty Tasks of the Armed Forces German Federal Ministry of Defence





Preamble of DWT / SGW



Ladies and gentlemen,

It is my pleasure to cordially welcome you as a participant of our 2nd International Symposium on the Development of CBRN Defence Capabilities here in Berlin. The results and feed-backs of our first conference 2 years ago have not only been encouraging but demanding to organize further events dealing with this important topic. Therefore we are very grateful that

2012: European Perspectives in an international Environment

we are again able to present 2 days with a broad variety of challenging plenary and panel sessions with high level speakers, complemented by an impressive exhibition of technological developments. The strong engagement of national and international institutions and actors reflects the necessary comprehensive approach to cope with CBRN related risks and threats, ranging from situational awareness, effective and efficient risk management to the availability of human and technical capabilities, processes and procedures for proper action or re-action. I am grateful to everyone for your interest and your participation, where-ver you have come from. My special thanks go to the Ministry of the Interior and its leading role in this event, to the European Union, to the Federal Office of Civil Protection and Disaster Assistance, to the Ministry of Defence, the German Army Association, and last but not least to all our speakers, sponsors and exhibitors. Let me invite all of you to use this symposium for comprehensive insights, an intensive information exchange and lively discussions.

Have a successful meeting and a good time in Berlin.

General (ret.) Rainer Schuwirth

Chairman, German Association for Defence Technology (DWT)



Ladies and gentlemen,

I welcome you to the 2nd International Symposium on CBRN-Defence Capabilities – European Perspectives in an International Environment on behalf of the German Association for Defence Technology – Centre for Studies and Conferences to this multinational event at Berlin.

Your presence at this conference - you have come from all over the world - shows that you share our concerns regarding the danger we are confronted with. Be it asymmetric warfare, terrorist's actions or environmental disasters.

Setting up this conference in 2010 we had the aim to focus more closely on the political and operational approach in developing and applying CBRN-Defence Capabilities than on the scientific approach. Since the line between both is very thin there are also contributions

Have a successful time here in Berlin!

LtCol (ret.) Wolf Rauchalles Managing Director, Centre for Studies and Conferences of the GE Association for Defence Technolgy (SGW) Federal Ministry of the Interior



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an interantional Environment

Plenary Programme of the 1st Day 08:00 **Opening of the Exhibition** 08:45 Welcome Notes / Opening of the Conference Norbert Seitz (Conference Chairman), Federal Ministry of the Interior General (ret.) Rainer Schuwirth (Co-Chairman), Chairman of the German Association for Defence Technology (DWT), Bonn Main Session A / Opening / International Policy Session chaired by *Norbert Seitz*, Federal Ministry of the Interior, Berlin 09:00 **Opening Key Note** Dr. Hans-Peter Friedrich, Minister of the Interior, Ministry of the Interior, Berlin 09:30 Security Planning and Architecture in the European Union Kristalina Georgieva, Commissioner for International Cooperation, Humanitarian Aid & Crisis Response, European Commission, Brussels 10:00 Coffee Break / Exhibition / Press Conference 10:30 **Global Security Policy Aspects in CBRN-Defence** Prof. Lisa Bronson, Professor at the National Defence University, Washington DC 11:00 Security Planning and Architecture in Russia Yuri Brazhnikov, Director, International Cooperation Department, EMERCOM of Russia Main Session B / Research and Industry Session chaired by Dr. Willi Marzi, Federal Ministry of the Interior, Berlin Provision and Handling of NBC-Situations in Switzerland 11:30 Martin Baggenstos, former President KomABC, Spiez 12:00 Challenges in CBRN-Research Dr. Karsten Michael, Head of Directorate III, Federal Office of Civil Protection and Disaster Assistance (BBK) 12:30 Introduction to the Panels I - VIII 12:40 Luncheon / Exhibition 14:30 Conference continues with the Panel Sessions I - VIII 16:15 Coffee Break 16:45 Future Challenges in Changing CBRN Defence Markets Sebastian Meyer-Plath, Managing Director, Bruker Daltonic 17:15 **Digital Dog Nose: Revival of Neutron based IED Detectors** Dr. Bogdan Castle Maglich, Chief Scientist, California Science & Engineering Corporation, USA 17:30 SuperCT: Fine Art and Science of Semiconductor Detector an Electronics Dr. Keiji Kobashi, Central Research Laboratory, Hitachi Ltd., Japan 17:50 **Discussion Round** International Cooperation and Interaction of Research Institutes, Industry and customers Prof. Dr. Holger Mey, Head of Advanced Concepts, EADS Deutschland GmbH, Cassidian Chair: Speaker: Dr. Thorsten Fischer, VDI Technologiezentrum Martin Baggenstos, former President KomABC Gerlof Johan de Wilde, Assistant Director R&T, EDA Dr. Thomas Weise, Rheinmetall AG Dr. Francois Murgadella, French MoD and Agence Nationale de la Recherche 19:15 Resume of the 1st Conference Day and Introduction to the Panel Sessions IX - XVI 19:30 Walking Dinner Buffet 22:00 End of the 1st Conference Day



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an international Environment Panels 1 - 4 (1st Day, 14:30 - 16:15) Panel I (Room B09 / Ground Floor) Risk Assessment, Risk Analysis, Reference Scenarios Chaired by Dr. Wolfgang Rosenstock, Fraunhofer INT 14:30 Introduction by the Chairman 14:40 INTERPOL and the Role of the Intelligence Driven, Prevention Orientated Investigation in Police CBRNe Counterterrorism Operations Ali Rached, Assistant Criminal Intelligence Analyst, Interpol 15:00 Improvised CBRN Devices: Threats and Response Andy Oppenheimer, Editor CBNW (Chemical, Biological & Nuclear Warfare) **CBR-Risk Analysis for an International Airport** 15:20 Dr. Albrecht Bongartz and Heinrich Dorsch, IABG 15:40 Advanced CBRN Risk Analysis using modern NEC Environments André Breitung, Rheinmetall Defence Electronics GmbH 16:00 Discussion Round with Panellists and Audience 16:15 Coffee Break Panel II (Room A06 / Basement) **CBRN Sensor Integration** Chaired by LtCol Hans-Jürgen Jacob, Bundeswehr Joint Support Command 14:30 Introduction by the Chairman 14:40 Efficient Networking of Mobile CBRN Detectors Wolfgang Fritsche, IABG 15:00 Integrated Network of Sensor Systems for CBRNe Perimeter Protection, Surveillance and Event Management Val Chrysostomou, Smiths Detection Innovations in CBRN Response: How Advances in Instrumentation Enable Faster 15:20 **Decision Making in the Field**

- Trey Sieger, Thermo Fisher Scientific 15:40 Airborne Infrared Hyperspectral Imager for Intelligence, Surveillance and Reconnaissance Applications Jean-Philippe Gagnon, Telops
- Discussion Round with Panellists and Audience 16.00
- Coffee Break 16:15

Panel III (Room A05 / Basement) Psychosocial Emergency Management Chaired by Dr. Willi Marzi, GE Mol

14:30 Introduction by the Chairman Psychosocial Crisis Management in CBRN Incidents 14:40 Claudia Schedlich, Federal Office for Civil Protection and Disaster Assistance **Psychosocial Support for CBRN Responders & Hospital Staff** 15:00 Claudia Schorr, Federal Agency for Technical Relief (THW) Realistic training for psycho-social preparedness 15:20 Dave Bull, Head of National Ambulance Resilience Unit Training for CBRN Capabilities, UK The Psychological Impact of wearing PPE on Health Professionals Perception of CBRN 15:40 Circumstances Dr. Catherine Bertrand, SAMU 94 / UPEC Créteil France 16:00 Discussion Round with Panellists and Audience 16:15 Coffee Break Panel IV (Room A04 / Basement) **Consequence Management - Decision Making** Chaired by Major Frank Schäfers, Bundeswehr Joint Support Command 14:30 Introduction by the Chairman CBRN Decision-Making Tools from the Definition of CBRN capabilities 14:40 to the Warning & Reporting in Operation Pierre Tuffigo, CBRNE Bid Management and Product Policy, THALES 15:00 **Consequence-Analysis and -Management** Norbert Kopp, tms Decision support in the field of explosive safety using hazard, damage and risk analysis 15:20 Frank Radtke, Fraunhofer Institute for High-Speed Dynamics, EMI 15:40 Warning and Reporting in military and civilian reconnaissance missions Dr. Baldur Stulgies, Rheinmetall Military Vehicles RMMV 16:00 Discussion Round with Panellists and Audience

16:15 Coffee Break Federal Ministry of the Interior



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	Plenary Programme of the 2nd Day			
08:00	Opening of the Exhibition			
08:15	Conference Continues			
	Main Session C / CBRN-Protection - Int. Concepts & Focal Points Session chaired by Colonel Dieter Jaksik, GE MoD			
08:25	CBRN-Protection – Perspectives by the United Nations Organization Nikita Smidovich, Weapons of Mass Destruction Branch, Office for Disarmament Affairs, United Nations			
08:50	CBRN-Protection – Perspectives by NATO <i>Major General Jon B. Lilland</i> , Assistant Chief of Staff, Programme and Planning Management at NATO SACT	Nikita Smidovich	Jon Lilland	Ruud Busker
09:15	EU's Position on CBRN-Protection <i>N.N.</i> , European Commission, DG Home Affairs, Unit A1 - Crisis Management and Fight against Terrorism			
09:40	Challenges on improvement of CBRN countermeasures <i>Ruud Busker</i> , TNO, Netherlands			
10:05	Coffee Break			
11:00	Conference continues with the Panel Sessions IX - XVI			
12:45	Luncheon / Exhibition			
	Main Session D / CBRN-Protection - National Concepts Session chaired by Colonel Henry Neumann, Bundeswehr Joint Support Command			
14:00	Experiences of CBRN-Protection in the UK (including Olympic Games 2012 and Crown Jubilee) John Jones, Deputy Head of Unit CBRNE, Office for Security and Counter Terrorism		B	
14:25	Saudi National Plan of Emergency Respond to Radiological and Nuclear Weapons Colonel Bander N. Aljabali and Lieutenant Colonel Dr. Ammar M. Magrabi, Ministry of the Interior, Kingdom of Saudi Arabia	Omar Maghribi	Gustavo Caruso	Weiss
14:50	Progress in the implementation of the Nuclear Safety Action Plan Gustavo Caruso, Special Coordinator of the Nuclear Safety Action Plan Team, IAEA			
15:15	Radiologic and Health Threats - A UNO Perspective Dr. Wolfgang Weiss, Chairman UNSCEAR, United Nations			
15:40	Coffee Break			
16:10	Final Discussion Round: Handling of CBRN-Hazards and Damage Situations: Political Risk Assessment, Risk- and Crisis- Communication	Ralph	Ernst Back	Gerold
Chair: Speaker:	General (ret.) Egon Ramms, former Commander JFC HQ Brunssum Ralph Tiesler, Vice President, BBK Brigadier General Hans-Werner Wiermann, GE MoD Ernst-Reinhard Beck, MoP, Defence Subcommittee Gerold Reichenbach, MoP, Germany	i foaroi		
17:30	Closing Remarks Ralph Tiesler, Vice President, BBK General (ret.) Rainer Schuwirth, (Co-Chairman) Chairman of the German Association for Defence Technology			
17:30	End of Conference			

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Panels 9 - 12 (2nd Day, 11:00 - 12:45)

11:00

Panel IX (Plenum / 1st Floor) **Risk Communication / Crisis Communication** Chaired by Colonel Klaus-Werner Schiff, GE CBRN Defence School



	March 1
25	
1	

Introduction by the Chairman

- Communication of Risks and Risk Communication. Biosecurity and the new dual use dilemma. 11:10 Dr. med. Dr. phil. Petra Dickmann, London School of Economics 11:30 **Psychosocial Crisis Management in CBRN Incidents** Mark Overhagen, Federal Office for Civil Protection and Disaster Assistance **Risk Perception of CBRN Attacks in the General Public** 11:50
 - Dr. Dieter Rhode, Chair Health and Prevention, Ernst-Moritz-Arndt-University
- 12:10 **Milieu Specific Crisis Communication**

Introduction by the Chairman

- Dominik P.H. Kalisch, Fraunhofer IAO
- 12:30 Discussion Round with Panellists and Audience
- 12:45 Luncheon

Panel X (Room B05 / Ground Floor) **Personal and Collective Protection** Chaired by LtCol Thomas Georg Haake, CBRN Defence School, Germany

A				Elke Reifer, Bundeswehr Research Institute for Protective Technologies and NBC Protection (WIS)
org	James	Simon	11:30	COLPRO in Modern Conflict
аке	Davidson	Read		James Davidson and Simon Reed, Smiths Detection
			11:50	A New CBRN-Suit for the Future Infantery(wo)man (Infanterist der Zukunft IdZ)
	0			Friedrich Hesse, Bundeswehr Research Institute for Protective Technologies and NBC Protection (
3	(20)		12:10	CBRN-Protection by Selective Permeable Membrane vs. Active Carbon
01				Dr. Samuel Wu, Perfect Defense Technology, Taiwan

11:00

e Infantery(wo)man (Infanterist der Zukunft IdZ) esearch Institute for Protective Technologies and NBC Protection (WIS) ermeable Membrane vs. Active Carbon e Technology, Taiwan 12:30

COLPRO: Idea - Requirements - Reasonable Integration

- Discussion Round with Panellists and Audience
- 12:45 Luncheon

Panel XI (Room B09 / Ground Floor) C - Reconnaissance/Analysis/Forensics Chaired by Dipl.-Chem. Mario König, Head of Analytical Task Force, Mannheim Fire Department





Introduction by the Chairman

- 11:00 11:10 Civil – Military Collaboration in CBRN: Fulfilling the Capability Requirement for Detection of Chemical Warfare Agents and Toxic Industrial Chemicals Ruud Busker, TNO, Netherlands
- 11:30 Field-Portable GC/MS for the Rapid Identification of Chemical Threats Kenneth Fredeen. Smiths Detection
- 11:50 Design and Assessment of two New Chemical (CWA, TICs) and Toxins Agents Identification Systems **Based on Mass Spectrometry**
- Stéphane Morel, Thales Communication & Security 12:10 A New Robotic Solution for CBRN Defence
- LtCol Jean Paul Monet, Departmental Fire and emergency brigade of Bouches-du-Rhone
- 12:30 Discussion Round with Panellists and Audience
- 12.45Luncheon

Panel XII (Room A03 / Basement) **B** - Reconnaissance/Analysis/Forensics

Chaired by Dr. B. Niederwöhrmeier, Bw Research Institute for Protective Technologies and NBC Protection



- 11:00 Introduction by the Chairman
- 11:10 Challenges of the Biological Aerosol Background on Biological Detection
- Janet Martha Blatny, Norwegian Defence Research Establishment (FFI) 11:30 Forensic Aspects in Medical Bio Reconnaissance
- LtCol (MC) Dr. Roman Wölfel, Bundeswehr Institute for Microbiology
- 11:50 Rapid and Easy Detection of Bio-Threat Agents in the Field
- Dr. Sybille Pagel-Wieder, miprolab
- **Biological Inactivation as Challenge for B-Analysis** 12:10 Dr. Birgit Hülseweh, Bundeswehr Research Institute for Protective Technologies and NBC Protection
- 12:30 Discussion Round with Panellists and Audience

12:45 Luncheon



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Panels 13 - 16 (2nd Day, 11:00 - 12:45)

- Panel XIII (Room A04 / Basement) N/R - Reconnaissance/Analysis/Forensics Chaired by LtCol Matthias Arnold, CBRN Defence School, Germany
- 11:00 Introduction by the Chairman
- 11:10 Localization of Radioactive Source Carriers in Person Streams Monika Wieneke, Fraunhofer FKIE
- 11:30 Finding that Needle in a Haystack
- Alec Morton, James Fisher
- 11:50 Search Procedures for Illicit Nuclear and Radioactive Material Theo Köble, Fraunhofer INT
- 12:10 Imaging Stand off Detection of Explosives by Infrared Backscattering Spectroscopy using Quantum Cascade Lasers *Dr. Harald D. Müller*, Fraunhofer IAF
- Dr. Haraid D. Muller, Fraunnoter I/
- 12:30 Discussion Round with Panellists and Audience
- 12:45 Luncheon

Panel XIV (Room A05 / Basement) Decontamination and Disinfection II

Chaired by Dr. Walter Biederbick, Federal Office of Civil Protection and Disaster Assistance

- 11:00 Introduction by the Chairman
- 11:10 Green Decontamination: A new approach to efficient CBRN decontamination *Dr. David Crouch*, Product Manager, PDX
- 11:30 Wastewater Treatment after CBRN–Decontamination Siegmar Mühlenbrock, Federal Office of Defence Administration
- CBRN Decontamination / Detoxication Operation in High Visibility Event and SX34 System for CBR Decon of Sensitive Equipment
 Dr. Stefano Miorotti, Cristanini
- 12:10 Operational Aspects of the CBRN Decontamination of Sensitive Equipment Hans-Joachim Töpfer, Kärcher Futuretech GmbH
- 12:30 Discussion Round with Panellists and Audience
- 12:45 Luncheon

Panel XV (Room A01 / Basement) Medical CBRN-Response Chaired by Prof. Dr. Jean Luc Gala, Belgian Defence Laboratories

11:00 Introduction by the Chairman

- 11:10 Medical Countermeasures Against Chemical Warfare Agents: Challenges for the Future Colonel Prof. Dr. Frederic Dorandeu, IRBA-CRSSA, Toxicology and Chemical Risks Department
 11:30 Topic to be determined N N.
- 11:50 Therapy Monitoring of Nerve Agent Poisoning in the Field Colonel, MC, Prof. Dr. Franz Worek, Bundeswehr Institute for Pharmacology and Toxicology
- 12:10 Human Biomonitoring a Versatile Tool in the Aftermath of a CBRN Incident *Prof. Dr. Michael Müller*, University of Göttingen, Member of the Commission on Civil Protection of the Federal Ministry of the Interior
- 12:30 Discussion Round with Panellists and Audience
- 12:45 Luncheon

Panel XVI (Room A06 / Basement) Training Procedures / Practical Training Chaired by Prof. Dr. Elke Jahn, Institute of the Fire Department of Sachsen-Anhalt

- 11:00 Introduction by the Chairman 11:10 **The "Terror-Lab" – A Detection** a
- 11:10 The "Terror-Lab" A Detection and Training Challenge! Dipl.-Ing. Marina Hagl, CBRN Defence School, Germany
- 11:30 Training System for Radiacs for Realistic Scenarios without Use of Radioactive Sources Dr. Jürgen Böttcher, Thermo Fisher Scientific
- 11:50 **Training with Simulation Substance TOXsim or with Live CWA Benefits and drawbacks** *Claus-Peter Polster*, Senior Project Manager, Hazard Control Engineering, Germany, Formerly Senior Safety Officer, OPCW, The Hague, NL
- 12:10 Scenario-Based Bio Recon Training at the Bundeswehr Institute of Microbiology *LtCol (MC) Dr. Roman Wölfel*, Bundeswehr Institute for Microbiology
- 12:30 Discussion Round with Panellists and Audience
- 12:45 Luncheon

















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Exhibitors 2012



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Bertin Technologies designs and markets

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www.bluecher.com



Bruker - Innovation with Integrity

Bruker Daltonik is the leading company in the field of CBRN detection. Widely regarded as the development, engineering and manufacturing expert of "easy to use" and reliable detection equipment; we have a proven record of excellence spanning over 30 years. Continuous innovation and a resolute commitment to provide "best of its class" products and services to customers is our driving force.

Trusted unrivalled performance We provide full spectrum CBRNE solutions and consist of a product line that totally satisfies the needs of the market. A wealth of industrial and scientific experience, innovation and constant close and enduring cooperation with customers across the globe; enable us to produce trusted and class leading equipment with unrivalled sensitivity that has real application for the user. Mass and Ion Mobility Spectrometry are supplemented by one of its kind bio organism and toxin detectors as well as feature packed radiological detectors all of which can be fully integrated into vehicles, ships and aircraft. Quality manufacturing ensures that all Bruker equipment produces reliable results.

Reliable and easy to use

Our products are built with the customer in mind, utilising clear, unambiguous interfaces and user friendly controls and software. Maintenance is kept to the lowest possible level and consumables are made with long lasting efficiency. We understand that uninterrupted, accurate and robust performance is a necessity when responding to an incident or deployed on operations. We ensure that all aspects of our service, whether that is supplying consumables, training or technical support; is given equal priority. Efficiency, readiness and flexibility are requirements of our processes and staff alike. The Bruker motto "innovation with integrity" applies to all aspects of the business.

www.bdal.com



Als wissenschaftliches Kompetenzzentrum der Bundeswehr berät das Institut die Führung in allen Fragen des Medizinischen B-Schutzes (= Schutz vor Krank heitsverursachern durch biologische Kampfstoffe) und gewährleistet damit die unmittelbare Urteils- und Handlungsfähigkeit auf diesem Gebiet. Das Institut führt neben der Medizinischen B-Schutz-Ausbildung Studien und angewandte Forschung zur Epidemiologie, Pathogenese, Erkennung, Vorbeugung und Behandlung von durch B-Kampfstoffe und vergleichbare Biostoffe verursachten (B-) Gesundheitsstörungen durch. Dazu werden Ex per tenlabore für die Spezialdiagnostik potenzieller B-Gesundheitsstörungen (z.B. Tularämie, Pest, Orthopocken, Anthrax), für die einsatzorientierte Aufklärung ungewöhnlicher Krankheits- und Todesfälle sowie zur medizinischen Verifizierung mutmaßlicher B-Kampfstoffeinsätze bereit gehalten. Das Institut kooperiert mit wissenschaftlichen Partnern im In- und Ausland und wirkt in nationalen und internationalen Fachgremien mit.

- Aufgaben- und Forschungsfelder:
- Bakteriologie und Toxikologie
- Virologie und Rickettsiologie
- Infektionsepidemiologie und --immunologie
- B-Risikoanalyse und Begutachtung
- Medizinische B-Spezialdiagnostik

- Medizinische B-Aufklärung und -Verifikation

www.sanitaetsdienst-bundeswehr.de



Bundeswehr Joint Support Command

Das SKUKdo ist das Führungskommando der Streitkräfte. Es ist der zentrale Dienstleister der Bundeswehr im In- und Ausland. Für die Soldaten und zivilen Mitarbeiter im Kommandobereich lautet das Erfolgskonzept: Innovatives, einsatzrelevantes, streitkräftegemeinsames Denken und Handeln. Bei seiner Gründung im April 2001 übernahm das SKUKdo viele Aufgaben und Fähigkeiten von Heer, Marine und Luftwaffe, damit sich die Organisationsbereiche ganz auf ihre speziellen Aufgaben konzentrieren können.

Im SKUKdo sind Fähigkeiten gebündelt und verfügbar, die zur Führung und Unterstützung von Einsätzen auch weit jenseits der eigenen geografischen Grenzen auf strategische Distanz erforderlich sind. Durch die Bündelung werden Ressourcen

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gespart und die Einsatzwirksamkeit der Streitkräfte gesteigert.

Das SKUKdo stellt die strategische und operative Mobilität der Streitkräfte sicher und trägt zur Sicherstellung der Führungsunterstützung im Einsatzgebiet bei. Dazu gehört auch die Bereitstellung eines integrierten Verbundes von Kommunikationsund Datennetzen im Inland und dessen Verlängerung in die Einsatzgebiete. Zudem ist das SKUKdo mit einem Anteil von 25 bis 30 Prozent selbst der zweitgrößte Truppensteller der Bundeswehr für sämtliche Einsatzkontingente. So nehmen SKUKdo-Kräfte maßgeblich an den weltweiten Eingreif- und Stabilisierungsoperationen der Bundeswehr teil - im Einsatzgebiet und rund um die Uhr aus dem Inland heraus.

Die weiteren Aufgabenfelder des SKUKdo sind äußerst vielfältig. Zu diesen gehören zum Beispiel Logistik, Zivil-Militärische Zusammenarbeit, Führungsunterstützung, Feldjägerdienst und Herausforderungen, die mit munitionstechnischer Sicherheit, Arbeitsschutz und dem Umgang mit Gefahrgut zu tun haben, bis hin zur Abwehr einer Bedrohung durch ABC-Kampfmittel. In der Luftwaffenkaserne Köln-Wahn befinden sich neben Stabsquartier, Personalund Operationsabteilung auch die Abteilungen Militärische Sicherheit, ABC-Abwehr. Zivil-Militärische Zusammenarbeit, das Feldjägerwesen, der Generalarzt der Streitkräftebasis und die Abteilung Logistik. Die Führungsunterstützung ist nach Rheinbach ausgelagert. Das Presse- und Informationszentrum der Streitkräftebasis, das ebenfalls zum SKUKdo gehört, hat seinen Standort in Bonn.

www.streitkraefteunterstuetzungskommando.bundeswehr.de

> C. C U S S N E T C O N S U L T

c.russ Netconsult

c.russ-NETCONSULT is your partner for climate related challenges within the micro range between human organism and object. We offer solutions for the optimization of moist management within textiles, functional clothing, automotive seating, sleep systems, helmets, rooms and more. Optimal moist management drives comfort and increases performance and relaxation potentials.

Measurement is the path to improvement and innovation. We offer B2B Technology, Managed Services, and Networking to support your individual challenges with body related heat and moist.

www.cruss-netconsult.com



CALSEC

CALSEC's mission is to manufacture and commercialize two classes of its unique proprietary Femto Sensor products for Homeland Security as well as diagnostic medicine. The technology named Gammu-Tron TM is comprised of non-invasive, nondestructive sensors. that decipher in real time, the chemical formulas of unknown objects at distances of up to 6 feet. Our sensor technology is based on Gamma and Neutron radiation. Its early version (Neutron Atometer), was developed and commercialized in the period 1997-2005 as Explosive Identification System, "EIDS" at a cost of \$15 million. Although EIDS represents quantum leap over the competing X-Ray based Explosive Detection Systems, "EDS", and has been successfully tested by NATO, DOD, FBI and foreign security agencies. This ability to read chemical "fingerprints" enables real world applications in bulk explosive detection and in biomedical applications for diagnosis of malignant cancerous tissue.





Coastal Environmental Systems

Coastal Environmental Systems, Inc. designs, engineers, manufactures, and installs professional weather stations. Each is designed from the ground-up, to be the most accurate, reliable system available. Whether you're in need of a fixed-base system for aviation weather, or an ice station in the Arctic, or anything in between, Coastal has more than 30 years experience designing systems to fit exactly what you want.

www.coastalenvironmental.com



Cristanini

CRISTANINI S.p.A. Company was established in 1972 and has a very long experience worldwide in the field of high pressure water technologies – with a very strong presence around the world – and offers a complete range of equipment of civilian, industrial, military and civil protection use. CRISTANINI's unparalleled experience and know-how is the result of years dedicated to research, applied engineering, equipment and accessories production in order to propose innovative solutions in the CBRN decontamination field, CRISTANINI S.p.A. close customer relations and wide range of experience have allowed the development of an extensive line of products designed to satisfy a myriad of customer needs and often to settle up important problems before unsolved. The R&D program is conducted in cooperation with the most famous University Institutes, including the Department of Chemical Engineering Processes of the University of Padova, Italy and Military Labs around the world. The state-of-the-art R&D is validated by 25 pa ents This is the result of a creative work and an integrated approach, searching for new solutions to highly complex scientific, technological and engineering problems. Official importers and representatives authorized in 73 different countries all over the world.

www.cristanini.it



Federal Office of Civil Protection and Disaster Assistance (BBK)

The Federal Office of Civil Protection and Disaster Assistance (BBK) was established on 1st May 2004 within the remit of the Federal Ministry of the Interior. Germany now has a central organisational element working to ensure the safety of the population, combining and providing all relevant tasks and information in a single place. The work of the Office includes carrying out the tasks of the Federation with regard to civil protection (previously: "civil defence", in particular supplementary civil protection, health-protection measures, protection of cultural property, emergency drinking water supplies), planning and preparation of measures to provide emergency supplies and carry out emergency planning, planning and preparation of cooperation between the Federation and the Länder with regard to special hazards (coordination of crisis management), planning/conceptual prevention for the protection of critical infrastructures, basic and further training, and training in civil protection and disaster relief, disaster medicine, alerting and informing the population, expansion of research into civil protection, in particular research into NBC hazards, enhancing citizens' ability to help themselves, conceptual and planning tasks in the area of international cooperation with the participation of all national civil defence agencies. With the multiplicity of services which it provides, the new Office sees itself as a federal service centre for authorities at all levels of the administration, as well as for organisations and institutions working in civil protection. It applies an interdisciplinary approach to all types of security meaFederal Ministry of the Interior



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sure for the protection of the population, and combines these measures to become an effective protective system for the population and the resources which are vital to individuals' survival.

www.bbk.bund.de



FOI

FOI is one of Europe's leading research institutes for applied research in the areas of defence and security. We are a government agency but the financing of most of our projects is assignment-based. Our main customers are the Swedish Armed Forces and the Swedish Defence Materiel Administration. We also have many assignments for other government agencies, local authorities and businesses. FOI's expertise is highly sought after internationally and we have the lead role in a number of EU projects. We carry out security policy analyses and assessments of various types of threat. We are leaders in underwater research and research into explosive substances. We also carry out research relating to aero systems and IT security, radars, lasers and other sensor systems as well as protection against hazardous substances.

www.foi.se



Fraunhofer INT

The Fraunhofer Institute for Technological Trend Analysis INT creates, and continually updates, a comprehensive overview of the general research and technology landscape and of the entire spectrum of technological development, national and international. Our clients are bodies from state and industry. We consolidate the general overview with our own specialized analyses and forecasts in selected technologies. With the support of our highly-versatile, state-of-the-art measurement infrastructure, the Institute also carries out theoretical work and experiments on electromagnetic and nuclear effects.

www.int.fraunhofer.de



Kärcher Group

Futuretech

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Kärcher Futuretech GmbH, as a subsidiary of the Alfred Kärcher GmbH & Co. KG, the German manufacturer of high-pressure

cleaning equipment, develops, manufactures, and markets products for the special needs of public customers. The company has an annual turnover of approx. 75 million Euro and more than 120 employees working in the central office in Schwaikheim, near Stuttgart. Recognised as a leading specialist worldwide, Futuretech concentrates on technology to assist in peacekeeping missions and disaster control: CBRN Protection Systems, Water Supply Systems, Field Camp Systems and mobile Catering Systems. Futuretech is a worldwide leader in CBRN protection for both military and civilian applications. We provide a comprehensive system consisting of decontamination equipment including decontamination devices, modules and systems, and chemical, biological, radiological and nuclear (CBRN) decontamination agents. Prompt and effective decontamination of persons, tanks and other vehicles, air and watercraft, personal weapons, clothing and equipment as well as sensitive material ensure the ability of the concerned troop, civilian population, police, frontier guard, etc. to survive. According to the specific needs. Futuretech offers customer-designed solutions on trailer or in container. Understanding the importance of basic drinking water in even the most demanding of environments, we have developed a variety of mobile purification systems. The systems design allows them to desalinate both sea and brackish water to provide safe drinking water, from any water quality available, without the use of chemicals. Even contaminated water sources can be purified with Futuretech's systems.Futuretech's range of field camps are deployable military facilities which - after a short assembly time - provide living and working conditions similar to those in the soldier's home country during an extended period of deployment abroad. Our systems promote the well-being of soldiers and task forces and enhance their morale and motivation. Futuretech offers a full product range with its modular structure. Components are sanitary facilities, catering systems, and laundry systems.

Futuretech as the mobile catering systems specialist designs, tests and produces future-oriented systems together with experts from all over the world. Both highly mobile and flexible in application, the mobile catering systems can be transported to the most remote sites - carried by road, air or sea. Futuretech is the capable system vendor for demanding tasks. The modern, highly mobile and compact solutions in standard modular form can be customised to meet any needs and configured accordingly. In addition to the German Bundeswehr, the NATO partners and armed forces worldwide, an increasing number of organisations in the field of civil defence place their trust in reliable solutions from one source - that source being Futuretech.

www.kaercher-futuretech.com



German Association for Defence Technology

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The German Association for Defence Technology (DWT) is a non-profit organization dedi-cated to matters dealing with national security.

It was founded in 1957 as an initiative of the GE FMOD and today numbers about 240 sustaining members and some 950 individual members.

The DWT has firmly established itself as a neutral forum for debate and information exchange in the German security policy community and is well on the way to gaining that same reputation also at Brussels, the capital of the EU and the seat of NATO's political headquarters.

It pursues the objective of promoting the knowledge of

- defence and security policy and
- defence and security technology.

In this context, defence and security economics are always subjects that are important to deal with. The DWT organizes numerous events to provide a forum for interested individuals and representatives from politics, business, the German armed forces, defence-oriented associa-tions, science and research, as well as from the general public.

The DWT's executive bodies – Presidency and Executive Committee – comprise highranking representatives from the above organizations. Their commitment is a tangible sign of the esteem that the DWT enjoys in the security policy community as well as in defence technology and industry circles.

www.dwt-sgw.de



Hirox

Our high quality optical, mechanical, and lighting designs give the Hirox 3D Digital Video Microscope Systems the highest optical inspection power (7000x), along with a variety of options and adapters, including the 3D rotary head adapter.

Our experience as lens makers allows us to make high quality lenses that have a large depth of field and can create high resolution images.

As lens makers, we believe that a good optical image is much more important than an image that is the result of digital enhancement.

An image based on optics retains a clear original image without having any damage done by digital enhancement in order to create a good image.

That's why the Hirox systems offer the



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most beautiful and the most accurate images that can be displayed by a 3D Digital Video Microscope!

www.hirox-europe.com

HITACHI Inspire the Next

Hitachi

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 320,000 employees worldwide. Fiscal 2011 (ended March 31, 2012) consolidated revenues totaled 9,665 billion yen (\$117.8 billion). Hitachi is focusing more than ever on the Social Innovation Business, which includes information and telecommunication systems, power systems, industrial, transportation and urban development systems, as well as the sophisticated materials and key devices that support them. For more information on Hitachi, please

visit the company's website at





IB Consultancy

IB Consultancy is a Defence and Security consultancy company with offices in Brussels and Singapore. Our main ambition is to make this world a safer and more secure place. To achieve this, we provide Defence and Security solutions to governments, and trade & industry.Our services include: - Security Research Consultancy. IB Consultancy offers its clients expert knowledge on threats, risk and vulnerability assess-

ment, and CBRNe countermeasures. - Business Consultancy and Public Affairs. IB Consultancy advises companies on their optimal business development strategies in the defence and security market.

- Training. IB Consultancy develops custom made training (class courses and e-learning).

- Security Events and Conferences. IB Consultancy organises worldwide Security Events and Conferences.

IB Consultancy has a tremendous and solid network of stakeholders, influencers and decision makers. It is a network built up by our highly skilled consultants, who have been working in the industry for decades. They bring with them their network from international organisations, national government departments, and research institutes dealing with security and defence issues.

> www.ib-g.com www.ibcevents.com



¹ INFICON

INFICON provides vital chemical identification systems for immediate, on-site detection and analysis of volatile organic compounds (VOC), such as toxic industrial chemicals and chemical warfare agents in air. soil or water. Our product line includes person-portable gas chromatograph/mass spectrometers (GC/MS), the benchmark for positive identification of organic chemicals with the highest degree of accuracy of any analytical technique. Stand-alone gas chromatograph (GC) instruments are ideal for monitoring VOCs in most industrial and environmental applications. INFICON chemical agent detection and VOC identification systems are used by emergency response, military, and security personnel and environmental testing agencies worldwide.

www.inficon.com



Meridian Medical Technologies

Meridian Medical Technologies[™], Inc. has more than 50 years of experience creating specialized products for military personnel and emergency responders around the globe. Meridian's antidotes are stocked by the U.S. Department of Defense, the U.S. Department of Homeland Security, and emergency medical services personnel.

www.meridianmeds.com



microfluidic ChipShop

Lab-on-a-Chip systems - portable analytical systems - for the analysis of biological or chemical samples are at the core of microfluidic ChipShop's business. Within its ChipGenie® edition instrument series ultrafast PCR systems, portable sample preparation units or electrophoretic systems are at hand allowing as well for sample preparation as well as for the later analysis of various kinds of sample matrices. microfluidic ChipShop GmbH offers miniaturized lab-on-a-chip components and systems, both as customized solutions as well as self-developed off-the shelf lab-on-achip products. The company covers the entire value- and technology-chain, starting from the design of the microstructures up

to biochemical functionalization of surfaces and reagent storage on the final chips. In addition, microfluidic ChipShop's own application department supports customers in the miniaturization of their biological and diagnostic tasks, e.g., in the transfer of biological assays onto a chip, including the selection of suitable materials and protocol adaptation.

www.microfluidic-ChipShop.com



Miprolab

The biotech company miprolab was founded in 2005, and is located in Göttingen (Germany). Our company offers a broad range of services in the development and manufacturing of immunochemical assays (e.g. lateral flow assays) starting from the production and selection of suitable immunoreagents (e.g. antibodies, buffers, conjugates) to the assay validation. Over the years, methods for the purification of a variety of bacterial toxins and the production of antibodies have been developed. These toxins, specific antibodies and anti-sera are supplied according to customer's requirements. The diagnostic section of miprolab offers the detection, isolation and identification of toxins and microbes from a variety of matrices. In a joint project with the Bundeswehr Research Institute for Protective Technologies and NBC Protection (WIS, Germany) and the Federal Office of Civil Protection (SPIEZ LABORATORY, Switzerland), miprolab GmbH was assigned to develop and produce lateral flow assays (LFA) for the rapid detection of different toxins, bacteria, and viruses. Current developments of the LFA include the main biological agents of the so called "dirty dozen", e.g ricin, Staphylococcus Enterotoxin B (SEB), botulinum toxin, Yersinia pestis (plague), Francisella tularensis (tularemia), Bacillus anthracis, and Vaccinia (smallpox).

www.miprolab.com



Mirion Technologies

For more over 50 years, the products and services of MIRION Technologies have been used in industrial environments and CBRN military applications. MIRION Technologies is a global provider of radiation detection, measurement, analysis and monitoring products and services. 17 of the 28 NATO militaries, numerous international government and supranational agencies Federal Ministry of the Interior



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use the dosimetry systems from MIRION Technologies - Health Physics Division to detect and monitor levels of exposure. With our innovative telemetry-enabled systems, command centers have the ability to actively delineate and manage eventdriven exposure zones. We offer a full line of hand-held instruments and portal monitors that enable precise exposure analysis and isotope identification. Our experts can help you implement a detailed program with monitoring devices, as well as comprehensive reporting and documentation, specifically tailored to the requirements of your agency. Our comprehensive range of equipments covers the different requirements necessary to each stage of investigation:

- Early warning,

Search and confirmation of the alert,Measurements,

- Identification of the products detected.

MRION's strength stems from its five divisions: Sensing Systems, Imaging Systems, Health Physics, Dosimetry Services and Radiation Monitoring Systems. Our products and services include: dosimeters; contamination & clearance monitors; detection & identification instruments; radiation monitoring systems; electrical penetrations; instrumentation & control equipment and systems; dosimetry services; imaging systems; and related accessories, software and services.

www.mirion.com



Mönch Publishing Group

The Mönch Publishing Group is one of the world's largest publishers in the field of international and regional defence periodicals. In addition, Mönch offers a wide range of military reference books. Mönch publications are distributed internationally and reach decision-makers in the defence administration and military procurement agencies. Furthermore, political and industrial leaders and experts throughout the world also rely on the vital information provided by Mönch defence publications, such as:

- WEHRTECHNIK (German), bi-monthly - MILITARY TECHNOLOGY (English),

- monthly - NAVAL FORCES (English), bimonthly
- RIVISTA ITALIANA DIFESA (Italian), monthly

- TECNOLOGIA MILITAR (Spanish), quarterly

- SAVUNMA VE HAVACILIK (Turkish), quarterly

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- AL DEFAIYA (Arabic), bi-monthly Some of our Top Sellers, such as The Handbuch der Bundeswehr und der Verteidigungsindustrie (German Armed Forces Handbook and Defence Industry Directory), which is published continuously for more than 30 years as a standard reference book, offers defencerelated data in a unique and unprecedented way and the Weyer's Flottentaschenbuch 2008/2010 (Warships of the World Fleet Handbook) published by Bernard & Graefe, a Department of Mönch Publishing Group, as many other defence related books, have to be mentioned.

www.monch.com



NBC-Sys

CBRN protection systems for defense forces and population

From design to production to customer support, NBC-Sys covers numerous technologies against Nuclear, Radiological, Biological or Chemical (CBRN) hazards. Its product range includes chemical and biological detection, air treatment for personal protection (gas masks, filter cartridges,... etc.) or group use (climate control and filtration system, incorporated in vehicles or buildings), as well as decontamination (aicraft, vehicles, sensing equipement and persons). Military and civilian applications Composed mostly of technicians, engineers and managers, NBC-Sys relies on the know-how underlying its creativity, project management and customer service. Our skills are in chemicals, biology, thermics, aeraulics, plastics processing, electronics (hard and soft), mechanics, measurement, testing and ergonomics. In order to better meet our customers' expectations (both military and civilian), NBC-Sys is implementing a proactive future-focused policy by allocating some 20% of its turnover to R&D activities. Our engineers work in close collaboration on advanced research with private, public and university laboratories (CEA, DGA...etc). NBC-Sys products can be seen the world over, in particular in Europe, Asia and the Middle East.

www.nbc-sys.com



Outlast Technologies

Outlast Technologies LLC, a privately held U.S. corporation, is the worldwide leader in phase change materials and applications. Outlast® technology is the heat management technology originally developed for NASA that enables any textile to absorb, store and release heat, providing increased comfort. Welcomed "side effect": Sweating is reduced dramatically, temperature is balanced actively and dynamically. Outlast® technology pro-actively responds to changes in skin temperature to manage heat and reduce moisture for everyday comfort.

For over 20 years, Outlast has been committed to the development of new fibers, fabrics and coatings incorporating phase change materials (PCM), expanding the use of Outlast® technology across more than 200 brands and a multitude of products in apparel, footwear, bedding... Outlast® technology is perfect for military operations that may expose soldiers or personnel to extreme weather conditions. You can find temperature regulating Outlast® materials for example in antiballistic vests, in combat uniforms, in protective suits, in helmets, in military boots, in socks, in underwear...

Outlast® technology is not wicking technology, which manages moisture by reacting to your sweat and pulling it away from the skin. Outlast® technology will proactively manage heat while controlling the production of moisture before it begins. That's the Outlast® difference. The benefits of Outlast® products at a glance:

- Absorbs excess body heat
- Manages moisture
- Reduces overheating
- Reduces chilling

mation, please visit

Reduces perspiration
 Continuously adapts to thermal changes
 Based in Heidenheim, Germany, the company Outlast Europe GmbH is responsible

for the European market. For more infor-

www.outlast.com



OWR

As a manufacturer of decontamination equipment, OWR has been setting the standards for CBRN defence and civil protection for more than 50 years. Using modern techniques and user-friendly application systems, OWR develops and builds efficient mobile decontamination solutions for its customers, offering them a complete service from product development to training and after sales service. With a full range of products ranging from small hand-held spray applicators such as the Cobra, to the containerised multi purpose decontamination systems such as the MPD 100i, OWR can offer a solution to fit the needs of the customer, and with a design team constantly developing new and innovative products, OWR is setting the standards for the future of decontamination and helping to provide a safer and more certain future for the world.



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Pall Aerospace

Pall Aerospace, together with its ECS integrator partner, has been chosen to supply its regenerable chemical, biological, radiological, and nuclear (CBRN) protection systems for the Terrier* military vehicle, operated by the UK Army. The Pall CBRN system protects vehicle occupants from all known chemical warfare agents.

It is a self-regenerating "fit and forget" system offering full broadband protection against all known threats. By comparison, traditional carbon technology units are ineffective against some modern chemical agents known as 'carbon breakers' and are vulnerable to certain toxic industrial chemicals (TICs.)

Pall Aerospace has developed a number of leading edge CBRN filtration technologies including;

- Regenerable CBRN systems for vehicles
- COLPRO for aircraft, warships, shelters
- Man-mounted CBRN system for aircrew protection

Pall Aerospace, a division of Pall Europe Ltd, designs and manufactures filtration and separation products for a wide range of military & civil applications including air intakes, fuel, hydraulics, lubrication and CBRN. Our advanced engine air protection systems are used on military vehicles world-wide whilst the latest integrated membrane (IMS) water purification/desalination systems are used to provide clean, potable drinking water from any source.

www.pall.com/aerospace



PDX

PDX is a UK based intellectual property and Technology Company that is actively commercialising its Vapour Jet products within multiple market sectors. Our patented products and technologies provide efficient and innovative industrial processes that help meet today's sustainability and economic goals.

Decontamination systems PDX decontamination products support emergency responders across the globe, providing rapid and effective CBRN decontamination with minimal liquid use. Broad chemical capability, coupled with super-fine droplet generation and complete non-line of sight coverage, affords complete CBRN threat mitigation within a single PDX system. We provide portable and mobile decontamination solutions both being equipped with our patented atomizer technology that generates micro droplets to ensure even and consistent coverage.

First Response System (FRS) Offering lightweight and cost effective decontamination the FRS is a highly mobile and robust back pack designed for maximum operational flexibility. The perfect CBRN decontamination solution in localized environments, for light vehicles and for personnel providing pressurized air, chemical agent and discharge module all in one unit.

Area and room decontamination Our larger integrated wide-area (~2000m3) solution combines our technology with true operational level decontamination capability and excellent rapid room filling capacity. Suitable for large scale infrastructure and heavier items of military equipment the mobile stand-alone system compliments the FRS in providing the end user with a complete CBRN capability.PDX continues to contribute to important advances in aerosol delivery and decontamination technology.

www.pdx.biz



Perfect Defense Technology / Life Savior™

The only CBRN protective laminated fabric, by selective permeable membrane technology, with lowest heat stress, lightest weight, most comfortable to wear with breathability, flexible, and most durable CBRN protection, liquid-proof, and wind-proof for all weather conditions.

Life-Savior[™] membrane is a revolutionary innovation of superior barrier, based on patented selective permeable membrane technology. It is very thin with lowest heat stress, lightest weight, best comfortable to wear with high moisture vapor permeability, flexible, liquid-proof, wind-proof and durable barrier against all known chemical and biological warfare agents and toxic industrial chemicals, either in liquid or vapor form, under all weather conditions. It provides > 24 hours of chemical protection after contamination, continuous wear > 45 days, > 7 laundries. It meets chemical agent protection specifications of US Army CRDC-SP-84010 and TOP 8-2-501 test methods.

www.perfectdef.com



roda MilDef

the whole range of ruggedised Computers and IT components

The products from roda MilDef GmbH are characterized by many unique features and

characteristics. The following features apply without exception to all products: - Extreme High Level protection against environmental conditions like temperature, shock, vibration, rain, dust, humidity, etc. and in addition excellent characteristics with electromagnetic shielding.

- MOTS (Military of the Shelf) – Thereby rapid availability and High Quality

 Product Life Cycles between 3 to 7 years
 Long Time availability of Spare Parts, guaranteed 5 years after End-of-Life, on request up to 15 years

- Transversal section in the usage, because many customized solution are made with Docking solutions or the unique Flex-Bay concept, without direct modifications at the computer

Nato Stock Numbers / Versorgungsnummern available for many Solutions
 Complete Availability of Test- and Certification reports like MIL-STD-810G, MIL-STD-461F, VG95373, DO160, ...

- All Products are available in a tempest version according to SDIP 27 class B (ER)/ Zone 1

- In preparation: Rocky RK9 according to SDIP 27 Level A

roda MilDef GmbH with locations in Lichtenau / Baden and Hüllhorst in NRW is since more than 10 years an innovative and reliable partner for the Bundeswehr and other European Forces, as well as for the leading international System Integrators in the Defence Industry.

roda MilDef is the initial founder of Mildef Technology AB with locations in Cardiff (UK), Helsingborg (SE) and Taipeh (TW). The internationalization of our business enables us to provide better Customer Service and optimised technical support worldwide.

www.roda-mildef.com



RSDecon

RSDecon is a brand of products manufactured for the Healthcare Protective Products Division (HPPD) of Bracco Diagnostics Inc. HPPD develops and markets products designed to protect the human body from external threats. The products are distinguished by rigorous scientific testing and field deployment by military and first responder organizations worldwide. HPPD, the sole manufacturer and marketer of RSDL, strives to improve people's lives by advancing the frontiers of medical knowledge and using that information to improve its existing products and bring new protective products to the marketplace.

Federal Ministry of the Interior



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SECOPTA

laser based sensor systems

Secopta

SECOPTA provides laser based analytic tools for applications in the fields of security technology, industrial process control and recycling systems.

SECOPTA GmbH was founded in 1998 as spin-off of the Clausthal University of Technology for the conversion of laser-based sensor concepts to field applications. The first efforts were systems for the detection of landmines and explosives.

The Defence Industry Committee (AVW) of the Federation of German Industries (Bundesverband der deutscher Industrie, BDI) assigned the development of an "Intelligent Laser Optical Mine Prodder" system with the Defence Industry Technology Prize 2007. This project was the result of collaboration between SECOPTA GmbH, the LaserApplicationCenter (LAC) of the TU Clausthal and the Bundeswehr Research Institute for Materials, Explosives and Lubricants (WIWEB).

Since 2007, SECOPTA established a second area of activity: the development of laser spectroscopic systems for material analysis in industrial applications. Here SE-COPTA benefits from the close collaboration with the parent company CryLaS GmbH. Its long lasting experience in the development and manufacture of compact laser sources just like high level and ISO9001 certified manufacturing processes is the basis for the high quality of SE-COPTA products.

Currently SECOPTA provides LIBS (laser induced breakdown spectroscopy) based analysis devices for qualitative and quantitative determination of the atomic composition of materials in industrial applications like sorting, online process monitoring, surface analysis, quality assurance and other. The applied techniques allow inline, on-site and in-situ measurements and automated data analysis.

Together with collaboration partners SE-COPTA developed the sensing system TDetect for the online and in-situ analysis of trace material. The underlying technology of micro-optical ring resonators gives the ability to detect target substances, even at very low concentrations of ppb or less. The selectivity is achieved by specific receptor coatings at the microrings. TDetect has the potential to cover the demand for highly sensitive and selective detection of hazardous substances in many military and civilian applications, such as the sensing of trace explosives at access control points, mine sweeping operations, ambient air monitoring or the detection of pathogens in the blood of humans or animals.



Securetec Detektions Systeme AG

Securetec Detektions-Systeme AG, founded in 1995, is a successful international solution provider that develops, distributes and supports biotechnology based detection systems for drugs, explosives and hazardous substances. Securetec's rapid tests are able to identify immediately and reliably a wide range of substances in many types of body fluids, liquids as well as on surfaces. The DrugWipe® product line of instant read out drug detectors has proven to be of great value to authorities at customs, border control, and military worldwide, as well as being the global leader in roadside drug screening for traffic safety. On-site cholinesterase values

Securetec Medical focuses on the development and marketing of rapid tests in clinical segments as well as detection of chemical and biological warfare agents. At present, we are working on onsite rapid testing devices for exposure to blister agents (e.g. sulphur mustard) as well as sub lethal radiation.

The latest in vitro diagnostic product is a cholinesterase field testing system. Exposure to cholinesterase-inhibiting substances such as nerve agents or organophosphate insecticides poses serious health hazard. A novel point of care IVD system focusing initially on military requirements was developed to face this threat. Now, the rapid monitoring of acetylcholine esterase activity is possible from a finger prick blood sample. The system ensures reliable diagnosis and can be easily operated and transported.

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TAKTIFOL-sheets adhere to any surface due to its electrostatic charge. In combination with the TAKTIKSTICKS, any markings can be easily wiped off with only few traces remaining.

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www.taktifol.com



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the fields of electrical engineering, electronics and precision mechanical engineering combine creativity and competence in the quest for advanced solutions inthe worlds of bomb disposal and remote handling technology. The telerob range of products encompasses EOD robots (tEODor und telemax), completely equipped bomb disposal vehicles (TEL600), bomb disposal equipment, non-magnetic special tools (NOMATOOLS), as well as manipulators for servicing, maintaining and dismantling nuclear facilities (EMSM). A highly qualified, highly motivated staff provides our worldwide client base not merely with innovative products developed and manufactured in accordance with the very highest standards but also with the training and instruction needed to ensure their effective use. telerob is an official NATO supplier and development partner (NATO supplier code: C 5152). Furthermore we conform to the requirements of AQAP 2130.

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Terrago

TerraGo® Technologies geospatial collaboration software and GeoPDF® maps and imagery are among the most widely adopted solutions to produce, access, update and share geospatial information and applications with anyone, anywhere. TerraGo solutions enable enterprises to extend, exchange and exploit georeferenced maps, imagery, audio, video, geoforms and other intelligence in connected or offline environments. Trusted by government agencies and businesses worldwide, TerraGo solutions increase the use of geospatial data throughout and between enterprises and the return on geospatial investment through greater organizational efficiency, productivity and responsiveness. Founded in 2005, TerraGo is privately held and is an In-Q-Tel company.

As inventors of the GeoPDF® technology, we've spent the past five years delivering powerful software solutions that are helping soldiers in the field, intelligence officers on a mission, first responders in emergencies, utility workers in the field, natural resource managers in the field, and thousands of other people access complex maps and images in the simple to use GeoPDF file format. TerraGo® Toolbar® is a no-cost software application that enables anyone, anywhere to access and interact with 2D and 3D GeoPDF® maps and imagery produced by TerraGo Publisher™ and Composer™.

In July 2012 TerraGo Technologies announced the acquisition of Geosemble. The software solutions from Geosemble and TerraGo are complementary, each providing customers with discrete functionality in support of a common mission. TerraGo geospatial intelligence software and GeoPDF maps and imagery enable users to produce, access, update and share geospatial information and applications with anyone, anywhere. In addition to other capabilities Geosemble has developed, its flagship product, GeoXray™, automates the process of discovering, geospatially visualizing, monitoring and sharing relevant unstructured information from any source. The software mines and processes content from news, blogs and social media and analyzes data by place, time and topic.

All of these capabilities are part of a much larger solution for the enterprises we serve that need actionable geospatial intelligence and enhanced situational awareness for planning and response.

Recently, Terrago has been involved in producing interactive, portable and intelligent TerraGo GeoPDF® maps and imagery for CBRN-type purposes. TerraGo Dynamic Map Book Composer can compile multilayer GeoPDF maps into digital map books covering wide areas such as a city, region or state. Once the map books are produced, they can be edited to maintain currency and distributed to provide a current Common Operational Picture. Non-GIS trained crisis managers and incident responders may then either receive or access new information about their Area of Interest via an appropriate method for the application. It is also imperative to ensure that Operations can be maintained in a disconnected environment at the greatest time of need

TerraGo has also developed technology to produce GeoPDF-based location intelligence reports that deliver actionable intelligence by integrating interactive 2D and 3D maps and imagery, multimedia, structured and unstructured information and services with user-provided analysis and applications.

In 2012, Terrago Technologies opened offices in Europe covering the EAME region. Please visit www.terragotech.com or contact smiller@terragotech.com +44(0)7951 445123

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Protection in the event of an attack

The global atmosphere is ripe with the fanaticism of international terrorism. Not a day goes by that those who protect us don't think of terrorism. Even more serious, not a day goes by that terrorists aren't thinking of us. Visit www.thebiodome.com to view examples of worldwide terrorism coverage in the media.

The Rand Corporation has recently completed a study for the Center for Disease Control (CDC), analyzing the affects of a Sarin Gas attack by releasing aerosol from a slow-moving truck into an urban center. The study indicated that Sarin Gas fatalities could occur in the first ten minutes.

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Airlock entry: 4'W x 5'L x 6' H Weight 11 lbs. Aluminum poles 3 lbs.





Abstracts of the Main Programme

Global Security Policy Aspects in CBRN-Defence

Professor Lisa Bronson

National War College, National Defense University, Ft. Lesley McNair, Washington, D.C. 20319-5078, bronsonl@ndu.edu

The development of CBRN defence capabilities occurs in the context of a dynamic, complex, and increasingly uncertain global environment. Unexpected and disruptive events like the damage to the Fukushima Daiichi nuclear power plant and the current conflict in Syria remind us of the inherent unpredictability of naturally occurring disasters and conflict. The first tested the radiological defence capabilities of Japan and the international community. The second has already resulted in the deployment of WHO experts to brief hospital workers in the region on how to recognize and treat injuries from exposure to chemical and biological weapons as well as radiation. In an ever-constrained resource environment, planning for CBRN defence capabilities requires navigation of the tension between focusing on likely dangers and planning for high-impact dangers that are plausible but not probable. In thinking about future threats and opportunities in this area it may be helpful to consider several global trends in the security environment and imagine what future wild cards might be. The investigation of six areas offers insights for decision makers. These include: the global economy, climate change, demography, emerging new powers and non-state actors, technology, and multilateral organizations. It is instructive to consider not only the trends in these areas but potential interactions between the trends and their influence upon the global security environment. Consideration of several wild cards may stretch our imagination and free us from the cognitive traps of our well-established mental models and conventional planning assumptions. Potential wild cards include: pandemics, natural disasters, disintegrating states, and conflicts over scarce resources. Active contemplation of these high-impact contingencies may assist the CBRN-Defence community in preparing for unanticipated disruptive CBRN-related events.

Provision and Handling of NBC-Situations in Switzerland

Martin Baggenstos former President KomABC, Spiez and Dr. Marc Kenzelmann, Leiter Geschäftsstelle "Nationaler ABC-Schutz" Bundesamt für Bevölkerungsschutz

The Protection of the Population against NBC Accident has a long tradition in Switzerland. In the 60 the main focus was on weapon of mass destruction, especially A-Explosion. With the beginning of operation of Nuclear Power Plant, the Focus was set primarily of the consequences of NPP-Accident. Protection of the Population is in the Responsibility of federal and cantonal/communal level so that a good coordination was necessary. The Federal commission on NBC-Protection has set up a strategy for NBC Protection as a common understanding for all involved governments. The strategy has 14 scenarios (with consequences) listed. The coordination is not only necessary for the different governmental level, but also between military and civil institution. The paper explain the actual situation and possible enhancement in Switzerland.

Future challenges in changing CBRN Defence Markets

Sebastian Meyer-Plath

Managing Director, Bruker Daltonik

Whereas the overall worldwide CBRN Threat has probably neither increased nor decreased over the last years, it is the kind of the imminent threat that has changed significantly.

Thankfully, the chances for large scale military usage of WMD has decreased, the scenarios of huge clouds of aerosolized Anthrax drifting over battlefields or artillery barrages softening up enemy trenches with chemical warfare agents before the attack are over. The potential use of smaller scale CBR in asymmetric warfare, however, has increased significantly and it is this change of threat scenario, which affects industry quite significantly.

Companies, formerly focused on working with military customers now have to adapt in order to satisfy the needs and requirements of a totally different customer base, different procurement procedures, different delivery and support requirements, different funding levels, less standardization regarding technical requirements etc, etc.

This talk discusses the challenges and resulting opportunities for an SME (small to medium enterprise) operating in an international environment and offers potential solutions.

Digital Dog Noise: Revival of Neutron Based IED-Detectors

Dr. Bogdan C. Maglich Chief Scientist, California Science & Engineering Corporation, Irvine, California

The 50 years delay in creating a nonintrusive chemically-specific explosive detector via neutron activation is a quintessential example of physics unmatched by engineering. Ever since Fermi proposed it (1950), a procession of false starts took place: Thermal Neutron Analysis (TNA), Pulsed Fast Neutron (PFNA), Pulsed Fast Thermal (PGTNA), Associated Particle (API), Neutron Back Scatter (NBS) and Neutron Resonance (NRA).

Neutrons generate 100 times higher gamma ray rates than best detectors can process. Increased neutron fluence often results in a decrease of processing rates. Neutron shielding often suppresses the signal:noise ratio by neutron multiplication. Detection range is limited to 0.3m because interrogation time is prop. to (distance)4 with solid target neutron generators.

Emergence of fast- neutron atometry (1999) revealed that – 1st time in History of Chemistry - stoichiometry of unknown molecules (e.g. cocaine) can be deciphered by fast neutrons via API to 1 atom accuracy. Atometers recognized IEDs with 97% probability; but interrogation took several hours. After API was dropped (2003), we performed stoichiometric detection of IEDs by bulk atometry in 10 min - still short of 10 sec military requirement. Stumbling blocks: a. Germanium's processing rate (long dead time) 20 kcps; b. cryo-cooling



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c. solid target neutron generator; d. time to accumulate sufficient statistical sample to compute full atometry of each object Digital Dog Nose (2012) replaced a. with SuperCT, a new CdTe gamma detector developed by Hitachi for general use :100 times higher rate, 800 - 2,000kcps; and 3 times higher gamma energies detectable .; b. operating at desert temperatures; c. with a plasma target generator, d. full atometry with hair-trigger atometry. Integral effect of a. –c. is chemically-specific recognition of potential explosive in 1 sec or less.

SuperCT: Fine Art Science of Semiconductor Detector and Electronics

Dr. Keiji Kobashi

Unit Leader, Central Research Laboratory, Hitachi Ltd., Ibaraki, Japan

The 'SuperCT' gamma detector consists of over 1000 tiny semiconductor detector CdTe(Cadmium Telluride) elements densely implemented in a compact volume. Subtle pieces of electronics enable parallel detection of gamma rays, achieving 30-100-fold increase in photon energy measuring count-rate. Parallel detection also provides unique information on inter-crystal scattering of gamma-rays which, in turn, results in nearly total suppression of the noise pulses.

CdTe detectors are widely used in medical applications where low energy gammas ray, typically < 662 KeV, are detected. In contrast, in neutron activation gamma energies up to 6 MeV have to be processed. Owing to its volumetric characteristic, the 'SuperCT' successfully has detected those high energy gamma-rays with high efficiency.

Resistance to crystal structure damage caused by the neutron irradiation is another important issue, since the 'SuperCT' is exposed to 2 orders of magnitude higher photon intensities. We have conducted a series of accelerated damage tolerability tests which resulted in a projected a crystal life time of 5-10 years, with appropriate maintenance.

Another key advance of the 'SuperCT' is its high temperature tolerability. Unlike germanium which requires cryo-cooling, our recent tests have revealed that, through a HV control sequence, efficiency of Super CT remains constant from below the room temperatures up to 60 - 70 degree Celsius.

These novel features of the large array CdTe detector, coupled to its very good energy resolution, appear to present the solution to the "unmatching" engineering issues that have plagued neutron activation based IED detection.

UNODA Activities

Nikita Smidovich

United Nations Office for Disarmament Affairs

UNODA is implementing mandates in the areas of disarmament and non-proliferation given to it by UN Member States through the General Assembly and the Security Council including the prevention of proliferation of weapons of mass destruction and responses to incidents of use of these weapons. The presentation outlines UNODA activities in two areas: promoting effective implementation of UN Security Council resolution 1540 (2004) and international investigations of alleged use of chemical and biological weapons. UNODA supports activities to implement requirements of resolution 1540 (2004), particularly in regard to assisting Member States in their national implementation efforts and in developing international and regional cooperation to achieve the key objectives of the resolution. UNODA is currently focussing on three important areas: (1) supporting regional implementation approaches; (2) enhancing cooperation between international organizations in support of the 1540 implementation; and (3) promoting engagement of civil society. The UN Secretary-General has the unique authority to conduct international investigations in response to reports from any Member State concerning the use of chemical and biological weapons in violation of rules of international law. This authority derives from specific mandates established by the General Assembly and the Security Council in the 1980s. UNODA is tasked with ensuring the smooth functioning of the Secretary-General Mechanism (SGM) for investigation of alleged use.

CBRN Protection – Perspectives by NATO

Major General Lilland HQ SACT, ACOS PPM

The presentation looks at the future challenges from the proliferation of weapons of mass destruction and defending against CBRN threats and discusses them in the context of current challenges operational challenges.

Specifically the presentation addresses the transformational aspects ACT has identified to address the challenges to NATO from chemical, biological, radiological and nuclear threats and links these to the capability development plan ACT is currently delivering to Counter Improvised Devices.

The presentation emphasizes that the process required to defend against both threats is to high degree identical.

This is particularly relevant given the new NATO Comprehensive CBRN defence Concept which is on the verge of being approved by the Military Committee, and the emphasis of the concept on prevention and lesser on protection and recovery.

The new concept once approved as MC 0603 will ultimately require reviewing current CBRN defence capabilities and considering new strategies in CBRN defence aimed at preventing the proliferation of WMD and breaking the CBRN Incident Chain as early as possible. With this respect C-IED approaches which have successfully bee adopted in the past years will inform and direct future CBRN defence capability development

The goal of the following presentation is to attempt to identify what the new understanding of CBRN protection, as detailed in the new concept, can ascertain from the experiences in Countering Improvised Explosive Devices.

The presentation will hopefully foster the national discussions which are required to match current CBRN defence capabilities to future requirements.





Abstracts of the Main Programme

Challenges on improvement of CBRN countermeasures

Ruud. W. Busker

TNO, CBRN Protection, Rijswijk, The Netherlands

Chemical, biological, and radiological (CBRN) incidents, be they intentional or accidental, remain major threats for the coming decades. Considering that the threat may either be state-supported or of insurgent nature, responsibility is not confined to Defense or Security but intermingled. The CBRN field is characteristic for having a very low occurrence rate but high impact. The unpredictable outcome of incidents with toxic chemicals, radioactive substances and particularly pathogenic micro-organisms affects military missions as well as societies.

CBRN incidents will have immediate consequences such as casualties, but also (disproportional) reactions due to uncertainty and panic which cause disruption. The low incidence implies that hands-on experience for response organizations is relatively low. Yet, the CBRN threat is becoming more and more unpredictable in the sense of actors, targets, scale, agents and means of delivery. This development calls for an adaptive approach, but not necessarily for development of dedicated CBRN systems, but rather for seeking to develop and subsequently implement CBRN solutions into existing and developing defense and security systems: an all hazard adaptive approach. Some efforts to achieve these innovations will be presented. All have complex multi-dimensional challenges and require multipurpose solutions. A typical example is development of rapid and reliable methods to identify the presence of micro-organisms in suspected samples, which has an expectant window towards the fight against infectious disease. Another example will be presented were technology for

chemical diagnosis of nerve agents and pesticides benefit finds dual purpose.

Radiologic and Health Threats - A UNO Perspective

Dr. Wolfgang Weiss Chair of UNSCEAR

For more than 60 years the United Nation Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) has assessed the gobal levels and effects of atomic radiation. The Committee comprises 27 member states who perform these assessments on behalf of all member states of the UN. UNSCEAR reports to the United Nations; the reports document the state of science in the relevant fields. They are the scientific basis for radioation protection of man and the environment world wide.

Health risk of ionising radiation at various levels oft the dose is assessed by epidemiological investigations of populations exposed to ionising ratiation and by radiobiological investigations; the most important cohort for epidemiological investigations is the one of the atomic bomb survivors in Nagasaki and Hiroshima. At very high doses (> 1 Gray) acute health effects like the radiation syndrom can develop – in many cases with deadly outcomes. At lower dose levels the predominant health risk is the development of stochatic health effects, eg. solid cancers as well as leukämia; non-cancer effects like cardiovascular diseases have also been identified as potential health risks. There is a high background of cancer and non-cancer diseases observed in every population. Ionising radiation adds to this background, the magnitude of the additional risk critically depends on the level of the dose received. At the high end of the dose range (>1 Gy) the likelihood of developing a radiation syndrom with potentially deadly outcome is very high. In such a situation the attribution of the health effect can be done at an individual basis by a pathologist. Well below a dose of one Gray down to about 100 millGray the attribution of the development of cancer is no longer possible at an individual basis but there is still the possibility to observe an increase of the cancer incidence above backgrond, eg. to attribute health effects at the level of a population group by epidemiological studies. Well below 100 millGray neither the attribution of health effects at individual level nor at the level of population groups is possible. The only option is the attribution of an additional health risk in a given population.

In the case of a nuclear (N) attack the dose levels in the affected population my vary over a wide range and they may result both in acute health effects as well as in stochatic effects. The highly exposed individuals require specific medical treatment as provided by the WHO REMPAN networt. Many of the radiological (R) scenarios discussed in the open literature may result in low to very low doses with the consequence that the individual attribution of health effects might not be possible at all. In such cases the most important protective measure is the rapide assessment of the magnitude of the dose received by individuals – very often a large number of victims. Networks for rapid screening of the doses received by individuals are established at national and international level to provide information on the doses received and the potential health risks accosiated with these doses.

Federal Ministry of the Interior



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an interantional Environment

Abstracts of Panel 1

INTERPOL and the Role of the Intelligence Driven, Prevention Orientated Investigation in Police CBRNE Counterterrorism Operations

Ali Rached,

Assistant Criminal Intelligence Analyst, Interpol

Around the world, police programs have wrestled with the challenge of CBRNE related crime. Since the costs in lives and money associated with CBRNE terrorism and crime are so high, the logical response is to prevent CBRNE crimes it in the first place. In this crime area, police cannot be content to wait for the dissemination of a dangerous pathogens, the dispersal of a toxic chemical or the detonation of a nuclear or radiological devise, and then answer the calls for assistance. In this crime area, law enforcement agencies need timely intelligence to be able to prevent a CBRNE-attack and launch an investigation. In the CBRNE crime area, prevention is key. Yet it appears to be a daunting task. How exactly can the world's police services prevent such incidents? To do so requires the effective application of the intelligence driven, prevention orientated police investigation. At INTERPOL we have examined this issue and developed a way to assist our member country police services and their inter-ministerial partners in facing the challenge. In looking at our member country police services, we saw that several programs have gone a long way down this road by applying a three part doctrine of targeted intelligence analysis, proactive prevention programming and robust investigations and operations capabilities.

Improvised CBRN Devices: Threats & Render-safe Procedures

Andy Oppenheimer,

Editor CBNW (Chemical, Biological & Nuclear Warfare)

An outline of current threats worldwide - Syria's chemical weapons; common industrial chemicals (e.g. chlorine - al-Qaeda in Iraq, Taliban use of organophosphates); radioactive sources and the paucity of RDDs; lone wolf threats.

EOD (explosives ordnance disposal) specific to improvised CBRN devices; challenges due to the lack of precedent (unlike the ubiquitous terrorist and insurgent use of IEDs). Rendering safe improvised CBRN devices may involve remotely controlled precision instruments for disruption techniques and advanced identification systems on robots to identify, sample and dispose of the toxic contents, and in some cases containment rather than disruption is applicable.

CBR-Risk Analysis for an International Airport

A.Bongartz, H. Dorsch

Industrieanlagen-Betriebsgesellschaft mbH (IABG), Ottobrunn, Germany; Department CC 51 - Vulnerability and Lethality

This presentation will brief on specific results of the joint research project "Airport Security System" (Flughafensicherungssystem, FluSs), sponsored by the German Federal Ministry of Education and Research within its research program for Civil Security. The IABG task covered the analysis of threats, the related damage and risk due to the release and dispersion of CBR agents in the critical infrastructure of an airport. For the purpose, threat scenarios have been carefully chosen and the expected damage evaluated in different categories like personal injuries, down-times of the facility and decontamination effort. Specific issues like crisis communication and possible idle threats have been addressed also. Facing scenario consequences with estimated probabilities of occurrence led to a risk related ranking of the scenarios. The results of the analysis will be presented along with derived counter measures and "fields of activities".

Advanced CBRN Risk Analysis using modern NEC Environments

André Breitung

Rheinmetall Defence Electronics GmbH

The security risks of the 21st century are asymmetric and transnational. The involved national and international challenges demand for network security answers and network security capa-bilities, which should be analyzed, prepared, trained, implemented and developed on department-, multi- and cross-national level.

The networking of these capabilities, - Network Enabled Capabilities (NEC) - and the use of NEC simulation- and test-environments inside the concept of networked security can investi-gate and analyze the dimensions persons, information and technologies in a realistic manner and contribute to their development.

To develop these concepts and techniques and to prove them on realistic scenarios, a simula-tion and test environment - due to similar requirements – was created for the Bundeswehr (German Armed Forces). Part of this architecture, which is distributed nationwide with sever-al simulators and real-time systems, is the so called NEC-Laboratory (Service Center) of Rheinmetall. At this central place operations and exercises can be planned and managed by use of real and simulated systems and the operations can be proved by constructive and virtual simulation systems.

Thus security staff is able at an early stage and at various places, to become familiar with highly complex and rapidly changing situations, e.g. CBRN-threats and to get acquainted with the typical local risks and to analyze them. Moreover, the procurement of technical device, as e.g. CBRN-sensors, can be represented with its parameters and their availability can be proved before they are used and installed. The contribution to this Panel 1 presents the capability portfolio of the NEC-Labs of Rheinmetall and shows different possible utilization for risk detection, threat analysis and assessment of scenarios as CD&E (Concept Development & Experimentation) Service Center for CBRN specific applications.



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Abstracts of Panel 2 / Panel 3

Integrated Network of Sensor Systems for CBRNE Perimeter Protection, Surveillance and Event Management

Dr. V. Chrysostomou

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From the Cold War era through the recent decades the possibility of a CBRNE incident has been and is still very real. An event either caused by a targeted action, accident or natural incident has the potential to affect the population in a number of different ways. When these incidents occur, those required to respond need to be provided with the right equipment to ensure that the situation can be contained with minimum human and asset loss. In order to enable commanders at all levels to assess the impact of CBRNE events on plans and decisions they must be provided with timely, accurate and evaluated information on these incidents. Collection, evaluation and exchange of information on CBRNE incidents form an important part of the CBRNE defence. To ensure timely provision of the most accurate data on CBRNE incidents and the resulting hazard areas a CBRNE warning and reporting capability is required. This is where integrated networks of sensor systems can play a key role in the response strategy and concept of operation. The ability to deploy sensors (manned or unmanned) that communicate real-time data using sensor networks is of great importance. If this capability is suitably explored and harnessed, it is envisioned that these networks can reduce or eliminate the need for human involvement in information gathering in certain civilian and military applications. The challenge is to provide a flexible, scalable, intelligent and integrated network of CBRNE sensors that will be able to feed accurate data into the Command & Control centre in a timely manner to enhance the commanders' common operational picture; whilst ensuring that the network can be deployed and operated in a number of different scenarios and deployment environments.

Innovations in CBRN Response: How Advances in Instrumentation Enable Faster Decision Making in the Field

Trey Sieger,

Thermo Fisher Scientific

Emergency responders continually seek solutions to make the response and remediation process easier, safer and faster. New small, rugged instruments are bringing the laboratory to the field, providing the answer to the question "What is the threat?" that much faster. In keeping with smartphone trends, leading edge instruments are now able to distribute this information wirelessly to decision makers in the midst of chaotic incident environments. The presentation will review how trends in merging instrumentation, communications, and remote support are leading to faster decisions and safer response for communities and responders.

Psychosocial Support for CBRN Responders & Hospital Staff

Barbara Blanckmeister, PhD, Claudia Schorr GE Federal Agency for Technical Relief (THW)

Civil protection forces deployed in disaster response operations under CBRN conditions are exposed to additional risks and pressures that may constitute a heavy psychological strain.

Nevertheless, including psychosocial crisis management into the regular training program of civil protection organizations or hospitals is not yet very common across Europe.

Experiences suggest that the adequate use of insights regarding psychosocial support helps to facilitate crisis management and response in several respects by:

- 1. enabling the responders to cope competently with CBRN incidents,
- 2. avoiding long term effects of psychosocial stress,

3. improving the coordination during the mission.

In the framework of a project funded by the EU Commission (DG ECHO), four partner organizations from Germany, the Netherlands and Spain have joint forces to address the per-ceived deficit by developing and testing a training program for operational forces and hospital staff who have to cope with CBRN incidents. Further outcomes will be an overview across Europe on the current status regarding the psychosocial support for civil protection respond-ers and hospital staff dealing with CBRN incidents, adapted Guidelines for Uniformed Ser-vices, and an adapted crisis management plan for hospitals.

The project partners are: The German Federal Agency for Technical Relief (THW), The German Federal Office for Civil Protection and Disaster Assistance (BBK), Krankenhaus Ma-ria-Hilf GmbH (CoP, Germany), Stichting Impact (The Netherlands); Ministerio del Interior, Dirección General de Protección Civil y Emergencias (Spain).

The project has started on the 1st of February 2011 and will end on the 31st of March 2013.

The conference presentation will focus on the description of the general design of the project, the key experiences of the two pilot courses and the major results of the final milestone of the project, the European conference held in Madrid in September 2012.

Realistic training for psycho-social preparedness

Dave Bull,

Head of National Ambulance Resilience Unit Training for CBRN Capabilities, UK

Over 900 staff attended HART residential training, preparing them for mass casualty incident response or events including: Terrorist, flooding, building collapse, CBRN, chemical suicides, firearms and serious transport incidents. All staff are at a higher risk of being exposed to traumatic incidents. Modules developed with Zeal Solutions focussed on applying an integrated approach to promote and protect responder psychosocial resilience. This approach included:

• Providing staff with job related, innovative, realistic and regular training;

- Making personnel aware of the importance of team working and operating as a cohesive unit;
- Developing confidence in operating procedures and equipment;
- Raising awareness of the critical role of support and in particular supportive management behaviour;



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 Providing staff with an awareness and understanding of stress, acute stress and PTSD to enable risks to be managed and psychological recovery promoted;

• Developing knowledge of post incident procedures and practicing them at exercises;

- Using lessons identified and debriefing systems to enable learning from incidents;
- · Selecting trainers on the basis of their ability to facilitate effective learning; and

 Implementing an integrated approach to evaluation which looked at process, impact and outcome evaluation and provided strategic input to ensure training was delivered with resilience and capability in mind;

All staff undertake an annual resilience and capability assessment. This is an assessment of the psychosocial hazards staff face and ensures resilience is protected and promoted.

Incorporating sessions that build psychosocial resilience in to the educational modules was key to success and evaluation showed positive results.

Candidate feedback

"I'm aware of how tough some incidents can be, including the tougher elements such as PTSD and the potential impact of an incident on my health in the training has left me better prepared and increased my confidence."

The psychological impact of wearing PPE on health professionals perception of CBRN circumstances

C Bertrand, E Lecarpentier, S Assad, J Marty

SAMU 94 / UPEC Créteil France

The vast events of 2001 had convinced the policy makers in France as well as the rest of the world to change their way of thinking towards a new concept regarding CBRN management. Owing to this, a national board for CBRN training was established in France and became the reference structure for the theme. On the same time, the Health Ministry started supplying hospital personnel with PPE which were derived from the military experience in the field. On the one hand, the training program of civil health professional was directed toward orienting them about potential CBRN risks and the importance/usefulness of wearing PPE during their field duty. For Health professionals that seemed a new concept opposing their preceding idea on PPE (for military people only and those for civil responders were not that efficient); On the other hand a test was set up before and after the training course to assess the trainees' perception regarding PPE. The program included training using impermeable and air permeable ensembles with masks and canister for respiratory protection. Results of the tests done on 1000s of Health Professionals came with significant outcomes. The tests showed the importance of proving to civil actors that those PPE were protective enough to be used (against their previous idea). Moreover the tests also demonstrated the needs of civil responders to improve PPE in order to decrease the heavy body burden it imposes on wearers; This is a crucial point to be employed in the FP7 European project, IF REACT which works on the same objectives. Here it is worth mentioning that the wardrobe of the French Civil responders needs to be reniewed in the coming few years after ten years of use. A good timing to improve the old set of PPE and to come up with new ensembles to satisfy Health professionals' requirements for more comfortable PPE respecting the different physical needs of civil responders (glasses, beards) and providing at he same time good protection level. If react project has received funding from the European community's Seventh Framework Program

CBRN Modeling, Simulation and Computation

Norbert Kopp

Managing Director, tms mbH

The presentation deals with modelling, simulation, and computation in the field of CBRN. The main focus is on "Computation". This particularly relates to methods used to enhance the computing speed of models involving the parallelization of algorithms and the use of special hardware. The models used in these acceleration methods calculate the dispersion of chemical, biological, and radiological agents and also include trajectory models. Areas of application mentioned in the presentation by way of example are "Dirty Bomb" and "Missile Defence". In the latter case the trajectory calculations play a key role. Examples of com-putational challenges are shown and the enhancement of com-puting speed is demonstrated.

Decision support in the field of explosive safety using hazard, damage and risk analysis

Frank Radtke

Fraunhofer Institute for High-Speed Dynamics, EMI

Explosives are used in a wide range of applications such as in civil engineering, mining, chemical industry or in military applications. In general, explosives should not pose a danger to people handling them or living in the surrounding areas but unfortunately accidents occur surprisingly often [1, 2, 3]. This emphasizes the importance of explosive safety. Of course regulations exist that solve most of the standard scenarios. But sometimes situations occur where standard regulations cannot be applied e.g. on deployed mission of armed forces. In these cases risk analysis approaches [4] can help to assess scenarios, improve the understanding of possible consequences and support an informed decision. The analysis process starts with a detailed scenario analysis describing the potential explosion sites (PES) and the exposed sites (ES) and of course protective measures – if any are applied. A PES may contain different types of hazard sources such as munitions or bare charges. Exposed sites include persons working on the site or being located outside of a compound as well as infrastructure and vehicles. Based on this data a hazard analysis is carried out. In this context, hazards refer to physical effects such as blast, fragments or debris originating from the PES. In the next step, the expected consequences of the event have to be evaluated. Therefore, damage to infrastructure as well as injuries of exposed persons are calculated. This allows an estimation of the expected consequences regarding the scenario, given an event occurs. Fortunately, – although accidents take place – the number of events is still limited. Often people can be evacuated before an event occurs, preventing human losses. Technical or organisational measures can be

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used to reduce the event frequency as well as the exposure of person to the danger. For this reason, the risk analysis process takes into account the event frequency as well as the exposure of persons to the analysed threat.

To be able to perform a reliable risk analysis, software tools such as the German Explosive Safety Quantitative Risk Analysis tool ESQRA-GE [5] can be used. The ESQRA-GE is a fast running hazard, damage and risk analysis tool that allows the user to perform all steps of a risk analysis as described above on a sound physical basis. It is possible to analyse a large number of scenarios in order to compare different options and to minimize the risk of the affected people by applying protective measures. In this way, the ESQRA-GE provides detailed information to the analyst and supports an informed decision process.

Warning and Reporting in military and civilian reconnaissance missions

Dr. Baldur Stulgies,

System Engineering CBRN/Ambulances, Rheinmetall MAN Military Vehicles GmbH

As of today both military as well as civilian reconnaissance missions are facing new and ever increasing challenges. Asymmetric threats show up at places never expected before. This is especially true with the threat associated with CBRN-attacks but also valid for other types of agents and different ways of release. To cope with such new threats new ways of reaction are mandatory. In addition to an outstanding analytical performance with respect to detection and identification customized "easy-to-use" operational software in reconnaissance missions is essential. The field of command and control focuses on the interface between the core capability of analyzing the hazard and managing the distribution, combination and storage of the relating data and results. While reporting of findings concerning the occurrence or absence of a threat is more or less the key task of a reconnaissance mission, the data management also supports the option of wrapping-up different missions. The integrated system approach enables to manage all relevant data by a single software system. Besides the operation of the different detection and identification devices such a system is capable of automated data storage and the transfer of relevant data and reports. The military community is using mainly reports defined in the NATO standard ATP45. Civilian first responders are using different approaches to report findings to a higher command. The Rheinmetall CBRN team has gained excellence experience in the field of reconnaissance systems over the last 20 years. The company is prepared to take the responsibility in cooperation with our partners for the improvement of the CBRN defence capabilities of the world-wide deployed forces and first responders not only with recce vehicles and CBRN platforms but also with CBRN specialised software.

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Dirty Bombs and the Decontamination of Infrastructure

Dr. Nikolaus Schneider

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The potential use of a Radiological Dispersal Device (Dirty Bomb), a conventional blasting device containing radioactive material, is expected preferentially in an urban area / environment, military targets could be barracks, field camps, airports, harbours etc. The explosion of such a device will cause a widespread distribution of radioactive material in the surrounding area and lead to a massive contamination of the infrastructure.

Decontamination of infrastructure after an RDD event is on our focus for some years now and is an important topic for international cooperation (Canada, France)

The following conclusions could be taken so far:

• The properties of contaminations caused by an RDD will vary strongly, depending on the nature of the radioactive material used.

• Decontamination efficacy depends on the properties of the contamination and the surface structures.

• Effectiveness of infrastructure decontamination is very limited. A reduction of activity / dose rate may be achieved, but no thorough decontamination.

• Primary goal for military can only be a first response in order to reduce loose surface contamination, thus minimizing contact and radiation hazard and the danger of resuspension.

Decontamination should be carried out as soon as possible after the event.

• Water/humidity further reduces decontaminability, soluble contaminations penetrate into porous surfaces, insoluble particles adhere stronger to the surface.

• Farther reaching decontamination methods are elaborate, expensive, time and work consuming and a task for specialists.

Aerosol technology for the CB Decontamination of interiors with sensitive surfaces

Dr. Markus Kostron

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For modern civilizations the usability of critical infrastructure and transport systems is essential. At the same time the terroristic threat for these objects has increased and attacks have shown how devastating the effect could be. Beside that, contamination of relevant interiors could also be caused by pandemics, chemical accidents etc. To limit the impact of such events, a rapid restoration of the utility of the critical infrastructure and the transportation systems is crucial. This means that the contamination has to be removed quickly and safely from the surfaces. Nowadays electronic components and equipment are widely in use in almost all areas. For interiors with such kind of sensitive surfaces aggressive chemical or thermal decontamination processes cannot be used. In these cases, the decontamination must be done at the lowest possible burden for the sensitive surfaces. Aerosol technology can be used successfully for the decontamination of interiors. But only by running the processes at the optimum operating range, a quick and efficient decontamination can be achieved.

Therefore a complete understanding of all relevant mechanisms is essential. In terms of reliability, required time, reproducibility and the material compatibility, the current processes deliver not optimal results. To develop an optimized process and to identify the best operating parameters, the aerosol generation, the aerosol transport processes in the interiors, the deposition on the surfaces and the decontaminant were analyzed more in detail.

Body surface delayed decontamination: is it worth showering?

Denis Josse

Institut de Recherche Biomédicale des Armées, Département de Toxicologie et Risques Chimiques, La Tronche, France.

People decontamination is required after an exposure to liquid forms (droplets, aerosols...) of toxic chemicals. When the whole body is potentially contaminated, it usually consists of a complete disrobing followed with an extensive body surface washing. For informed and prepared populations, such as the military in an operational context, decontamination procedures, including the use of specific individual decontaminants, can usually be rather quickly implemented and as a result effective. For civilian populations, in a terrorist or industrial incident context, decontamination might not start in the first 30 min following the exposure. In this scenario, would the body surface decontamination still be effective and consequently worth performing it? We addressed this issue both by using ready-to-use kits (fuller's earth, RSDL) and currently recommended procedures (showering) following in vitro skin and hair exposure to organophosphate nerve agents. Some of these studies were part of the European Union funded "Orchids" project.

CT-Analyst – Fast and Accurate CBR Emergenca Assessment

Michael Schatzmann, Bernd Leitl, Denise Hertwig, Frank Harms, Meteorological Institute, KlimaCampus, University of Hamburg, Germany

First responders need a more or less instant estimate of danger zones resulting from accidentally released hazardous materials in order to take immediate action, to coordinate rescue teams and to protect human population and critical infrastructure. To fulfill the need for a sufficient dispersion modeling accuracy while maintaining efficient access to reliable results in a first responders environment, systematic high resolution pre-accidental LES modeling can be combined with 'physical data reduction' in an emergency assessment tool. CT-Analyst is a typical example of such an approach adjusted to the geometry of the Hamburg inner city area. It runs on a laptop and comes with an interface as is common in computer games. The system is fast because results are pre-computed for a large number of meteorological situations. In case of an accident predictions are based solely on already existing knowledge. The system is easy to handle due to its user-friendly interface. In the talk details of this new emergency management tool for the city of Hamburg will be presented.



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Evaluation - Observations on Purpose and Focus

Hans H. Kühl, Colonel (ret'd),

Author of 'Defense-Protection against Chemical, Biological, Radiological and Nuclear Threats in a Changing Security Environment' hhkuehl@gmx.de

The purpose of Joint Force's NBC Defence capability is to help to deter the use of NBC weapons and to protect forces from NBC events so that they are able to accomplish the mission and maintain freedom of action.

Consequently, reflecting potential risks and the need to be able to survive and operate in NBC conditions operations are to continue with a minimum of degradation and loss of tempo. Evaluation of all CBRN defence capabilities must concentrate on this overriding goal. Using the following examples the presentation illustrates existing or lacking consequences of this approach. First: Possible stages of equipment evaluation ranging from testing garments, Manikins and volunteers in laboratory environments up to and including operational field tests are assessed according to their respective validity and time and effort. Second: While decontamination is mainly concerned with decontamination solutions, technical aspects and decontamination hardware, a wide range of requirements of decontamination in CBRN mass casualty events in particular is most often overlooked. Third: According to their respective goals, the military (to continue missions with minimum degradation and loss of tempo) and first responder (best possible optimization for the individual responder) protection philosophies show significant differences driven by their particular standards, training and equipment.

The Impact of the 2010 Lisbon Summit on CBRN Defence Training

LtCol (DEU-AR) Bernd Allert

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NATO places a high priority on preventing the proliferation of weapons of mass destruction (WMD) and defending against chemical, biological, radiological and nuclear (CBRN) threats. Present and future security challenges require NATO to be prepared to protect and defend against both State and non-State actor threats. In particular, NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats endorsed at the 2009 Strasbourg/Kehl Summit noted the spread of WMD and the possibility that terrorists will acquire WMD, as the principal threats to the Alliance over the next 10-15 years.

At the 2010 Lisbon Summit NATO's Heads of States and Governments expressed their concerns about the proliferation of weapons of mass destruction (WMD), and their intention to continue to implement NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against Chemical, Biological, Radiological and Nuclear Threats. The North Atlantic Council (NAC) was tasked to assess and report on how NATO can better counter the proliferation of WMD and their means of delivery.

The report reviews the status and gaps and offers potential solutions for WMD issues in three areas key to success in further developing NATO capacity to counter WMD - planning, exercises and training, and operations and capabilities. Realistic and challenging exercise play involving CBRN is essential for enhancing coordination, identifying weaknesses and ensuring effective response to CBRN crises. Progress has been made within NATO to begin to address gaps through concerted NATO civil-military cooperation, especially with regard to joint planning, training, and exercises.

References

 C-M(2009)0048(INV) – NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of Weapons of Mass Destruction and Defending against Chemical, Biological, Radiological and Nuclear Threats, 31 March 2009.
 C-M(2011)0041 – Lisbon Tasking to Assess and Report on how NATO Can Better Counter the Proliferation of Weapons of Mass Destruction and their Means of Delivery, 7 June 2011.

CBRN-Training in Civil Protection in Germany - Federal Aspects

Dr. Dorothee Friedrich

Federal Office of Civil Protection and Disaster Assisance (BBK)

According to the German Constitution there is a distinction between disaster response and civil protection. The states (Länder) are responsible for disaster response (peace time), the Federation (Bund) is responsible for civil protection (war time, "Verteidigungsfall"). Thus CBRN Training in civil protection takes place both at state level and Federal level.

The task "CBRN protection" is fulfilled in both cases mainly by the fire brigades.

CBRN training is regulated by the Fire Service Regulation 2 (FwDV 2 "Ausbildung der Freiwilligen Feuerwehren"). The FwDV 2 covers both CBRN Training in disaster response and additional CBRN Training in civil protection, the latter based on the Federal Law of Civil Protection and Disaster Assistance.

The fire brigades receive additional equipment for CBRN reconnaissance and decontamination ("ABC-Erkundungskraftwagen", Dekontaminations-Lkw Personen", "Messleitkomponente", "Analytische Task Force") and additional CBRN training for these tasks, both at the expense of the Federation (Federal Ministry of the Interior).

The additional CBRN training in civil protection is conducted by order of the Federation mainly at state level in the municipalities and the State Fire Service Colleges.

Above the level of the states an advanced CBRN training is provided at the Academy for Crisis Management, Emergency Planning and Civil Protection, which is part of the BBK. Target groups are mainly CBRN leaders / on site CBRN trainers (e.g. Analytical Task Force) and CBRN trainers of the State Fire Service Colleges, but also CBRN advisers and experts from different authorities and scientific institutions.

Furthermore, AKNZ offers CBRN training courses at a national and international level in communication and cooperation with other CBRN Training Centres. Based on experience they include a large quantity of necessary practical training. The aim of these courses is to contribute to a common understanding and an improvement of interagency communication and cooperation in international missions.



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Exercise Clean Care: a Unique CBRN Medical Training Event for NATO

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Since 2007, every two years a medical Chemical Biological Radiological and Nuclear (CBRN) exercise is organized by a voluntary nation under the auspices of the medical subgroup (working team 4) of the NATO CBRN training task group. The USA and Danemark hosted the first two editions of this unique training event that allows participating nations to compare their doctrine and standard operating procedures and exchange information and best practice on different aspects of the medical management of CBRN casualties. France hosted the exercise in November 2011 in La Valbonne barracks near Lyon. The exercise scenarios were based on a simulated, multinational deployment operation requiring the ability to operate in a contaminated environment. CBRN events took place requiring response in the full range of medical CBRN defence functions with the support of non-medical CBRN units. Some 400 players from Belgium, France, Germany, Great-Britain and The Netherlands as well as nearly 90 observers from 16 nations participated in this event. Enhanced realism was achieved using detection simulators, mannequins as well as volunteer amputees. After a presentation of the exercise, the main outcomes will be highlighted. Despite the re-organization of the CBRN Training Task Group, these exercises will continue and evolve into even more joint exercises.

Fukushima and Thoughts about the CBRN Situation in Germany

Mario König,

Head of Analytical Task Force, Mannheim Fire Department

The presentation describes first the ancillary conditions of the search and rescue operation after the earthquake and the tsunami in Japan 2011. Than the SEEBA (rapid deployment unit for search and rescue) a special unit of the German THW (Federal Agency for Technical relief) is described, which is part of the Ministry of the Interior. The first focus is on the CBRN-protection procedures and tasks during the mission. The duties ranged from longtime preliminary planning for the complete USAR team until executing different radiological measurement. The second focus is on the lessons learned for a similar situation in Germany. It describes the gaps identified during the mission in Japan, but just as well the findings which have been made after returning home.

Reliable instrumentation – a prerequisite for successful CBRN protection

Stanislav Bradka, Josef Brinek and Tibor Mikes National Institute for Nuclear, Chemical and Biological Protection, Kamenna 71, 262 31 Milin, Czech Republic, mikes@sujchbo.cz

The Czech National Institute for Nuclear, Chemical and Biological Protection is an experienced user of the Bruker products. The paper describes the Institute tasks, facilities and some of its key instrumentation acquired for research, development, testing and other activities. It briefly indicates the needs for further integration of detection, identification, monitoring and measuring devices in compliance with its effort to improve protection of the society against emerging chemical, biological, radiological and nuclear (CBRN) threats. The purpose of the presentation is to acquain the audience with practical applications of the aforementioned products under various circumstances and with the Institute observations.

Psychosocial Crisis Management in CBRN Incidents

Mark Overhagen

Federal Office for Civil Protection and Disaster Assistance

Charakteristisch für CBRN Lagen ist die Schwierigkeit das Betroffene und zum Teil auch die Einsatzkräfte nicht die genauen Gefährdungspotentiale beurteilen können. Aufgrund dieser Unsicherheit besteht ein hoher Bedarf an Krisenkommunikation in CBRN Lagen. Komplex wird dies zudem, da die Einsatzkräfte Schutzkleidung tragen müssen, welche die üblichen Kommunikationsformen erschweren. Somit ist es wichtig, kommunikative Mittel und Wege zu finden diese schwierigen Situationen zu bewältigen

Risk-perception of CBRN Incidents in the General Public

Dr. Dieter Rhode,

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Prevention of and preparation for CBRN incidents are major tasks for many organizations, departments and stakeholders involved in civil protection. Due to its extreme nature and potentially severe consequences extensive preparation is reasonable, even for incidents which seem rather unlikely. As far as the general public is concerned, CBRN incidents seem rather unlikely as well, however, in contrary to organizations involved in CBRN protection this leads to reduced interest in CBRN protection and additional information on the subject. An extensive FP7 funded study (CATO) on CBRN terror related incidents separately assessed likelihood and severity of C, B, R, and N related incidents. Outcomes are put it into perspective with respect to more common hazards and other severe incidents of non terroristic nature. Extensive knowledge on the general public's perceptions and reactions to CBRN incidents and CBRN related communication may improve compliance as well as insight into actions taken by the general public, which at first sight seem unreasonable but prove well-thought-out on second sight.

Milieu specific crisis communication

Dominik P.H. Kalisch

Fraunhofer IAO

In case of a disaster, the public needs to be warned and informed about the situation and the further operation by the disaster authorities, e.g. evacuation or which security measures need to be taken by the population. For the communication, the authorities have multiple





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channels they can use to transport their information, e.g. radio, TV, mobile devices, etc. But not everybody can be reached through each channel with the same probability. Because each subpopulation has different media affinities, that means that some groups can be informed over certain channels better than over others. In a crisis situation it is important for the disaster authorities to know the amount of information saturation that can be reached through each media channel. Because this depends on the respective subpopulation, one has to consider the population affinities of the subpopulation that should be reached. The population that needs to be reached is based on the area that is affected by a disaster, so we not only need to know which subpopulation can be reached through which media the best, but also where they live.

In this presentation we will present the different media affinities of German milieus. We will also illustrate a method with which we are able to predict the milieu composition in a given area based on the infrastructures in the according neighborhood.

COLPRO: Idea - Requirements - Reasonable Integration

Dr. Elke Reifer

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The idea of Collective Protection (COLPRO) is to provide purified breathing air under mission conditions. The technical requirements highly depend on the scenario and the scope of deployment. The scenarios vary from the classical NBC protection of a combat vehicle to the protection of a full medical facility within a wide range of possible CBRN threats. While a modern combat vehicle is equipped with an air conditioning system and has to cope with the dust loading and the other threats of the operational environment (including flue gases of its weapon system), a medical facility has to be provided with a sterile and controlled atmosphere during its whole operation time and at any CBRN threat. These different scenarios cause a wide range of requirements. The increasing requirements demand modern concepts and innovative technical solutions. The precise definition of the specifications is required for the integration of an economic reasonable solution and therefore leads to an accepted COLPRO concept.

CBRN COLPRO in Modern Conflict

James Davidson and Simon Reed Smiths Detection

What is CBRN Collective Protection (COLPRO) and where does it fit in modern conflict. There are a number of types of COLPRO that I will address later, but the aim of my presentation is to provoke thought and discussion about a particular aspect of COLPRO - transportable COLPRO. In my presentation I will reiterate why COLPRO is required, what type is apparently deficient, highlight the view of an integrated system approach to COLPRO then hand over to my colleague who will give an example of a modern, deployable, integrated transportable COLPRO system. The apparent lack of modern expeditionary, or transportable COLPRO in national and international inventories might suggest that transportable COLPRO is a subject of fairy tales; an imaginary product that is often talked about, but seldom seen. A quote from the British (Unofficial) Army Rumour website does little to dispel the myth: "COLPRO or COLlective PROtection. An almost mythical item of equipment that would make working in an NBC environment feasible. The reality is that the British Army possesses approximately enough COLPRO to protect one very small mouse' Is COLPRO the fairy tale clinderella(Aschenputtel, Cendrillon, Cenerentola, 3onyuka, 灰姑娘) of the CBRN domain? The word "Cinderella" has, by analogy, come to mean one whose attributes was unrecognised, or one who unexpectedly achieves recognition or success after a period of obscurity and neglect – perhaps an analogy that could be ascribed to COLPRO.

A new CBRN-suit for the future infantry(wo)man (Infanterist der Zukunft IdZ)

RDir Friedrich Hesse

Bundeswehr Research Institute for Protective Technologies and NBC Protection (WIS)

It is impossible to encapsulate a soldier being exposed to a CBRN or TIM contaminated environ-ment completely (including external air supply) during military missions, a "remaining risk" needs to be taken into account. The most effective solution used by many forces around the world is per-meable CBRN-protective clothing. A durable oil and water repellent treated cover fabric is attached to an adsorptive layer containing activated carbon. This fabric combination repels liquids and ad-sorbs dermal toxic vapours while still allowing the transfer of human heat and moisture to the ambi-ent. Small airborne particles (aerosols) are subjected to a different separation mechanism and will (up to a certain diameter) pass the fabric almost unimpeded. The "Bundeswehr" is doing research to improve aerosol protection for years. At the beginning the threat to the skin caused by aerosols needed to be addressed (under consideration of environmental factors) in a quantitative reliable and reducible way. With a wind channel specifically developed for fabric testing and tests on whole suits lots of investigations were done. The "Wehrwissen-schaftliches Institut für Schutztechnologien" (WIS) got enough information on the penetration be-haviour of aerosols through fabrics to address a capability gap of permeable protective materials. With the test results available so far a new permeable material was created adding a nonwoven fab-ric containing fibres with a diameter down to the micrometer-scale size to the carbon layer which is capable of effectively separating smallest particles. The heat and moisture transfer properties and the air permeability of the fabric as well as the total weight will not be impaired significantly at the meantime. Using the optimised aerosol barrier fabric, developing aerosol tight seams and seals to mask, boots and gloves a new CBRN-protective suit for the IdZ was created. System tests and wear trials on the new suit indicated, that the wear comfort of the suit is comparable to that one of the "Lightweight Overgarment" (especially developed for missions of German forces in hot climate areas) while the protection against hazardous aerosols is significantly enhanced.



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CBRN Protection by Selective Permeable Membrane vs. Active Carbon

Dr. Samuel Wu

President, Perfect Defense Technology Co., Ltd.

Chemical weapons have been used since World War I. Conventional wisdom for soldier's chemical protective suits has always been the use of active carbon suits for about a century. In order to give sufficient protection, these suits are relatively heavy, bulky, and sweaty, with limited absorption capability. They can usually be used in the field for < 24 hours after contamination, and < 45 days after seal bag open if not contaminated. However, when under mild windy condition, chemical warfare agent vapor could be blown by wind through the active carbon suits to attack human body, as active carbon may not have sufficient time to absorb chemical agents under mild windy situation. Ironically, current chemical agent permeation tests for active carbon suits were not properly designed to simulate real windy situation. Unfortunately, without alternative technology, soldiers have no choice but to wear heavy bulky sweaty active carbon suits. Many soldiers complain that they would rather die by chemical poison than by wearing active carbon suits, which causes great discomfort, too much heat stress, and simply too hot to survive! Furthermore, active carbon suits cannot properly protect wearers from biological warfare agents or radioactive particulates. Selective permeable or semi-permeable membrane has been proposed for CBRN applications in about a decade. The concept is to use organic polymer membrane that is light weight, flexible, moisture vapor permeable for comfort, with ultra low CBRN agent permeation. Commercial gas separation membranes are inorganic ceramic type membranes which are too stiff and fragile to be suitable for CBRN protective suit applications. Life-Savior™ fabric laminate is based on our patented revolutionary selective permeable organic polymer membrane technology, not relying on short life and many shortcomings of active carbon technology, intelligently designed to save life under any weather and environmental circumstance. It provides > 48 hours of chemical protection after contamination, continuous wear > 45 days, and > 10 laundries. It is very thin with lowest heat stress, lightest weight (< 1/2 weight of active carbon suit), comfortable to wear with high moisture vapor permeability, flexible, waterproof, liquid-proof, wind-proof, particulate-proof, and most durable for CBRN agent protection. It can be optionally flame-resistant or knife-resistant properties if face fabric is also chosen to have such flame-resistant or knife-resistant properties. Life-Savior™ fabric laminates can also be used to make shoes, hats, tents, sleeping bags, and gloves, for a complete set of whole body all-in-one protection.

This report will cover chemical agent test of Top 8-2-501 method to compare active carbon fabrics vs. Life-Savior™ laminate under no wind and windy conditions.

Civil – Military collaboration in CBRN: fulfilling the capability requirement for detection of chemical warfare agents and toxic industrial chemicals

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In the Netherlands, the armed forces are building capabilities for structural crisis support in case of incidents with chemical, biological or radiological (CBRN) agents. These include systems for Detection, Identification & Monitoring (DIM). This paper describes R&T support for procurement of DIM systems for chemical warfare agents and toxic industrial chemicals. The following major questions have been dealt with:

Which are the most relevant chemical compounds that must be detected, considering inherent toxicity? The basis for answering this question was to down-select existing large agent databases on the basis of inherent agents hazard and likelihood of exposure.
Which compounds are most relevant, considering abundance in the Netherlands, realizing that military crisis support capabilities will either be present in a 'preventive' fashion or be present later than 2 h after release? The most important aspect taken into account was transport volumes of chemicals in the Netherlands.

• Which C-DIM technologies would be feasible to detect the selected compounds? This was achieved by combining knowledge of the chemistry of agents and underlying detection technological principles.

• Which operational considerations must be taken into account? This was done by expert assessment of operational draw-backs and limitations of the selected technologies and by analysis of the concepts of operational use by letting end-user allocate weight factors to a set of criteria. The criteria comprised functional performance as well as physical, operational and logistic aspects, Answering the questions mentioned above has been done in a sequential approach. The first result of the study was a list of 96 compounds that shall be detected, including chemical warfare agents, all satisfying the above criteria. A short-list of C-DIM technologies, all having custom-of-the-shelf products, has been delivered. An assessment was made of the compounds that can be detected by each of the technologies. A method, in the form of a software tool, was then developed to make a balanced analysis of relevance of compounds, compliance with user needs, practical applicability of C-DIM technology and detectability. Next, an operational, staged, approach was designed to provide coverage of the agents list by a limited number of detection technologies. It turned out that smart combinations are feasible that would almost completely cover the list of agents to be detected with sufficient reliability. Such combinations appear capable to fulfill the operational and requirements under the criteria mentioned above.

Field-Portable GC/MS for the Rapid Identification of Chemical Threats

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The rapid and accurate detection and identification of chemical warfare agents and toxic industrial chemicals is critical to the protection of military and civilian personnel. The use of gas chromatography/mass spectrometry can provide both the sensitivity and selectivity required to identify unknown chemicals in complex (i.e. real-world) environments. While most widely used as a laboratory-based technique, recent advances in GC, MS, and sampling technologies have led to the development of a hand-portable GC/MS system that is more practical for field-based analyses. The GUARDION[™] GC/MS uses a low thermal mass GC column coupled to a unique toroidal ion trap mass spectrometer (TMS), both of which are keys to providing a system that is small, relatively lightweight, provides fast start-up and analysis times, and can operate on battery power. In addition, the system has been ruggedized and sealed against contamination, which is required for field use in harsh environments. The system has been optimized for use with a unique solid phase microextraction





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(SPME) sampling device that can be used with gas, vapor, liquid, and dissolved solid samples and simplifies sample collection and introduction. Novel approaches to mass calibration, baseline correction, peak identification, deconvolution, and library searching enable this GC/MS system to provide results that are approaching, if not comparable to, those from much larger stationary systems found in the laboratory. This presentation includes an overview of the unique technology within the GUARDION GC/MS along with experimental evidence of its analytical capabilities, including improved chromatographic separation, extended temperature and mass ranges, and the ability to automatically deconvolve and identify closely-eluting substances.

Design and assessment of two new chemical (CWA, TICs) and toxins agents identification systems based on mass spectrometry S. Morel and L. Dudragne

Thales Communications & Security, stephane.morel@thalesgroup.com, laurens.dudragne@thalesgroup.com

The emergence of asymmetric warfare / terrorism and the development of chemical threat has heightened the need to widen the spectrum of chemical agents to be identified and the concept of use of identification devices.

Since more than twenty years, Thales is building on its operational analysis capabilities to enhance the performance, mobility and usability of CBRN identification devices. Covering the most recent operational needs, Thales is currently developing two identification systems

A portable device to be used by first responders on the field to identify broad spectrum of CWA & TICs (VOC and inorganic compounds)
 A fixed device to be integrated in deployed laboratory to identify broad spectrum of CWA, TICs and toxins

(protein/peptide toxins and low molecular weight toxins).

Based on state-of-the-art of mass spectrometry and sample treatment, main functionalities of these new systems are :

- · Identification of chemical agents in vapor, aerosols, liquid and solid phasis;
- Identification of chemical agents and toxins in complex matrix (environmental samples: stagant water, mud, soil, ...) without laboratory sample treatment;
- Fast and fully integrated sample treatment for toxins identification (less than 30 min);
- Mass spectrometry technology compatible with the use of common standard mass spectral libraries and software (NIST/EPA/NIH, SwissProt, NCBI, AMDIS, Mascot, SEQUEST...)
- Use of common subunits for both devices to simplify logistics and maintenance costs.

This paper will focus on the on-going technological developments and their concept of use. This development is supported and financed by the French Ministry of Defence (DGA).

A New Robotic Solution for CBRN Defence

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New threats and growing CBRN risks have highlighted the advantages of using robotic systems for inspection or intervention purposes, in particular in harsh environments.

As in many countries, France benefits from direct government funding for various research programs; this has led to the development of a land robotic system named Cameleon®, which offers significant advantages to emergency services facing unusual missions.

As an end user, the Bouches-du-Rhône fire and emergency brigade is both the initiator and operational leader of this program. A 'topdown' analysis and various studies on threat scenarios have enabled the definition and assessment of this robot concept. The fruit of 5 years of research and development, the solution consists of a modular robot incorporating a large array of sensors and task

modules, including infrared imaging, a high-definition camera, liquid and gas samplers, a gamma spectrometer, etc. The idea was to integrate the CBRN sensors already used by emergency services, rather than developing new, dedicated detection systems.

Various partners have contributed to this achievement, including the specialist robotics company ECA, the CEA (national alternative energies and atomic energy commission), which contributed its knowledge of gas and radioactivity detection technologies, and the INERIS research agency which assisted in improving the safety of the device in potentially explosive atmospheres. A new program is currently in progress to optimise the robot's heat resistance, create and test new mission modules, and enhance the human-machine interface. This new tool is already used by various specialist squads and provides good support during human CBRN missions. It has also helped to improve the safety of first responders.

Localization of Radioactive Source Carriers in Person Streams

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The localization and tracking of radioactive sources in public facilities like airports or stations is a problem of highest security relevance. The accumulation and the severity of terrorist attacks during the past decade give reason to the assumption that future attacks could also involve radioactive material packaged with conventional explosives. The only way to avoid such kind of attacks is to localize and arrest the person carrying the material to its destination. But since radiation is not perceivable by human beings, the security guards are largely dependent on technical decision support to perform this task. We consider a security assistance system consisting of gamma scintillation detectors that are distributed along a corridor wall to check passing people for radioactive material. Furthermore, the system consists of a set of tracking sensors simultaneously providing the positions of all persons during their walk through the corridor.



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In this talk we present and evaluate techniques to estimate the assignment of radioactive detections to person tracks. With these techniques the security assistance system continuously analyzes the surveillance area; it alerts the security guards only in case of detections and it indicates which of the persons have a high probability of being the source carrier. The system is demonstrated in a real experimental environment.

Search Procedures for Illicit Nuclear and Radioactive Material

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The recovery of fissile or radiological material illegally removed from its site of operation or storage is tremendously important in the context of the possible threat of nuclear terrorism. The process of tracking the material during transport or storage by means of a covert search is preferable to an open search as it does not draw the attention of civilians, thus preventing counter-productive reactions of panic by the general public or even early release by the terrorists. The Fraunhofer-INT has engineered a measurement system with an additional battery powered energy supply which can be integrated in a standard car, featuring built-in gamma and neutron detection techniques as well as portable detection devices. It is therefore well-suited for covert search routines with respect to nuclear or radiological material which is transported across or stored in residential or industrialized areas. Realistic case scenarios were investigated where nuclear or radioactive material was concealed on a test area, partly even inside buildings. At first, the rough location of the material was determined by means of the car's built-in detection system from inside the vehicle. Then the search for the exact location was continued on foot, using a portable detector which provides the opportunity to locate and subsequently identify the material in question. This way a thorough search of an area was conducted. This approach demonstrates a real life scenario. The search strategy as well as the results of these search procedures will be presented.

Imaging Standoff Detection of Explosives by Infrared Backscattering Spectroscopy using Quantum Cascade Lasers

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Optical techniques based on laser spectroscopy represent a promising approach for contactless investigations from safe distances. Organic chemical compounds typically exhibit strong characteristic absorbance patterns in the mid-infrared (MIR) within the range of the third atmospheric transmission window (8 μ m - 14 μ m). Quantum cascade lasers are compact, robust and wavelength-versatile MIR-semiconductor lasers and provide ideal illumination sources for this purpose. We developed a mobile system for the detection of solid traces of explosives on surfaces using hyperspectral image analysis. The system relies on active laser illumination, synchronized with the collection of the backscattered radiation by an infrared camera. The key component is an external cavity quantum cascade laser with a tuning range of 300 cm-1 that enables us to scan the illumination wavelength over the characteristic absorption features of a large number of different explosives using a single source. The technique is eye-safe and enables concealed observation. For hyperspectral image analysis we combine the adaptive matched subspace projection with an Adaptive Target Generation Process. In such a two-step process the algorithm separates the uncontaminated area from contaminated area and identifies the chemical species. We investigated traces of various explosives including e.g. PETN, TNT and RDX on different real world substrate-materials. For medium distances (< 3 m), concentrations down to some 10 µg/cm2 can be detected. For higher material concentrations, we demonstrate detection distances up to 28 m. The large tuning range of the laser proved to be crucial both for the ability to identify most of the known explosives used in the fabrication of IEDs. We obtain high detectivity with acceptable false alarm rate.

Green Decontamination: A new approach to efficient CBRN decontamination.

Dr David Crouch

Product Manager, PDX

New approaches to the remediation of contaminated atmospheres surfaces and solutions by Chemical, Biological, Radiological and Nuclear (CBRN) materials are important for protection of human health and the environment. For example the safe containment of a large scale release of biological agents into the environment is an extremely challenging undertaking. The clean up of a 4 hectare area of Gruinard Island, located off the coast of Scotland and was contaminated with anthrax spores during world war II required an estimated 2 million litres of 5% formaldehyde in sea water (Manchee et al., 1994). As part our environmental remediation portfolio we report on a combined approach for delivering environmentally friendly biocides, with state of the art atomization technology, to remediate infrastructure contaminated with biological agents. PDX atomization technology generates supersonic gas flow into which decontamination media can be delivered producing extremely small droplets. Rapidly projecting these droplets in the form of a dense and turbulent mist PDX technology is capable of delivering decontaminants to all non-line of sight surfaces. Drastically reducing both the chemical footprint and time required for effective decontamination. This combination affords minimization of decontaminant mass per unit of application whilst maintaining an efficient surface and airborne decontamination capability.

Wastewater Treatment after CBRN Decontamination, Possibilities and limitations in mobile deployment — An inspection of principles

Siegmar Mühlenbrock,

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In Bundeswehr peacekeeping missions, erecting and operating field facilities is the responsibility of the defense administration, not the field units. This division of responsibilities distinguishes the Bundeswehr from most other armed forces. Field units are therefore seldom outfitted with mobile wastewater and waste treatment equipment. As a result, every operation requires one-off solutions that have to be tailored to its requirements. To ensure mobility, the armed forces currently employ container solutions fitted with biological treatment and





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downstream microfiltration stages developed. These are designed to treat wastewater of a composition similar to that of domestic households. In the event of insufficient wastewater treatment capacities during construction phases or due to a sudden increase of personnel in the field facilities, the directives on the handling of wastewater prescribe irrigation across large areas with an appropriate distance to open waters, groundwater, habitations, and agricultural fields. The illustration highlights the importance of effective water pollution control and shows the limits of arable space along a water flow in Afghanistan. However, the planning of wastewater treatment technology has hitherto neglected to consider integrating treatment systems for decontamination wastewater. The presentation will address this aspect in the following questions: Can the technology that is currently available handle metered addition? What special features are necessary? What further considerations must be taken into account? What substances require investigation? In this context, the combat agents that decontamination facilities may be faced with will no doubt play a central role. These are, however, difficult or even impossible to determine beforehand. The basic principle here is to eliminate or destroy the active principle of the combat agent by way of a decontamination agent or to transfer the combat agent from the contaminated material to a washing or rinsing solution. The imperative of a successful decontamination usually involves an excess use of decontamination agent, since it is hardly possible to precisely measure the success of decontamination in the field. In the further deliberations, we will therefore take for granted a degree of dilution that has no negative effects on the further wastewater treatment.

CBRN Decontamination / Detoxication Operation in High Visibility Event and SX34 System for CBR Decon of Sensitive Equipment

Dr. Stefano Miorotti,

Cristanini

As former Commander of CBRN specialized unit I would like to start from my operational experience (Balkans, Iraq and Afghanistan) where I was called to find solution directly in the field. As you know unexpected situations always happen and these are situations where you have to adapt the doctrine from books to the terrain. These are situations in which you can test capabilities, flexibility and limit of the equipment in service. Today the strongest army is not necessarily the one equipped with more tanks, aircrafts and submarines, but rather the one which has got the capability to handle the latest weapons and to protect at some time the life of the soldiers and the equipment.

Operational Aspects of the CBRN Decontamination of sensitive equipment

Hans-Joachim Töpfer

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Regarding the CBRN threat the quick elimination of CBRN contamination will be of remarkably high importance. In this context, some essential operational aspects of this subject will be analysed and presented from a practical point of view. The aim of thorough CBRN decontamination is above all to render further actions possible without wearing personal CBRN protection equipment. Therefore the decontaminated material shall not present a source of danger which surmounts the acceptable residual risk. Different kinds of sensitive equipment can be mission critical. The CB decontamination of optical and electronic equipment which cannot be treated using aggressive liquid decontamination chemicals can be carried out by special vacuum procedures. The vacuum decontamination technology for chemical warfare agents represents practically a chemical-free "dry" decontamination of CWA. After the vacuum chamber is being loaded with the relevant sensitive equipment the decontamination procedure runs practically automatically so that the personnel requirement is low in comparison. The vacuum B decontamination is a new patented technology for this purpose. The procedure is carried out by degrading biological warfare agents by pressure induced impact of gaseous biological decontaminants. The described vacuum B and C decontamination procedures are fast becoming the decontamination technology is currently available with the serial decontamination systems TEP 90 and other systems of the German Bundeswehr.

Medical Countermeasures Against Chemical Warfare Agents: Challenges for the Future

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Despite the entry into force of the international chemical weapon convention in 1997, chemical warfare agents and related compounds still represent a credible threat because of their potential use in military operations or during terrorist attacks. Organophosphorus compounds, either the classical chemical warfare agents often referred to as the nerve agents - e.g., soman, sarin, VX - or the pesticides, or the vesicants, sulfur mustard and lewisite, are among the agents of most concern. After more than 70 years of considerable efforts, research on medical countermeasures against nerve agents marks time. Major progresses were achieved between the 50s and 70s with the demonstration of the efficacy of anticholinergic drugs and carbamate-based treatment enhancers, the introduction of oximes as antidotes and benzodiazepines for the prevention of seizure-related brain damage. The main challenges we are now facing are the reduced efficacy of oximes against some of the main threat agents, their inability to reactivate the inhibited enzymes in the brain, the difficulties to treat nerve agent-induced status epilepticus and prevent the long-term neurological consequences. Dermal exposure to these nerve agents induce therapeutical challenges that were not foreseen some years ago such as time-to-treat. The consequences on nerve agent poisoning of the operational constraints faced by our soldiers are almost totally unknown. Research then focus on: a) detoxification of organophosphorus molecules before they react with their biological targets by the administration of bioscavengers; b) protection and reactivation of central acetylcholinesterases, c) improvement of immediate and delayed therapies to prevent death and neurological sequelae, using regular or alternative routes to optimize drug delivery. Vesicant-induced pathophysiology remains poorly understood limiting therefore the design of appropriate countermeasures. For skin injuries, current strategy consists of symptomatic management designed to relieve symptoms, prevent infections, and promote healing. Pulmonary and eyes insults remain difficult to treat. Against lewisite, the historical antidote presents untoward effects but the replacement candidates may not be as efficacious. After an overview of current strategies, some possible new avenues for an efficient management of chemical casualties will be presented.



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Therapy Monitoring of Nerve Agent Poisoning in the Field

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Nerve agent poisoning is a challenging threat for military and civilian health care systems. Numerous victims with respiratory insufficiency will face limited capacities for ventilatory support. Therefore, medical measures have to be directed to restore respiratory insufficiency immediately. To this end, atropine and an oxime (e.g. obidoxime) can be administered by soldiers during self and buddy aid. While atropine is able to cope with a variety of signs and symptoms only oximes are able to remove the impairment at respiratory muscles, namely the diaphragm. This important effect can be ascribed to the specific mechanism of action of oximes, comprising in removal of the nerve agent from its primary target, acetylcholinesterase (AChE). However, if poison persists in the body while the antidote is eliminated, initial successful therapy can subside resulting in delayed death. Thus, an appropriate parameter for on-line and on-site monitoring of oxime effects appears necessary. As red-blood-cell AChE (RBC-AChE) is an appropriate parameter a portable test system (ChE check mobile) was developed that is able to determine this parameter within 4 minutes on-site. In pigs poisoned with lethal VX doses a marked decrease of RBC-AChE activity preceded the development of severe symptoms. When an oxime was administered, RBC-AChE activity increased but dropped down again when the oxime concentration decreased. Repetitive oxime administration was again correlated with an increase of RBC-AChE activity. In conclusion, the commercially available ChE check mobile can be used on-site to monitor oxime effectiveness in nerve agent poisoning.

Human Biomonitoring - a versatile Tool in the Aftermath of a CBRN incident

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Human biomonitoring (HBM) is a well established tool in occupational and environmental medicine. It allows to determine the internal dose of a chemical absorbed by an individual after acute or chronic exposure. Moreover, biological reference and treshold values may be used to evaluate the internal dose and to estimate potential damage to the health of the exposed person in the future. HBM and its advantages have not been broadly recognized from a civil protection point of view, therefore we have designed a compendium to define state-of-the-art HBM sampling after a release of chemicals in a civil protection scenario. The compendium integrates the sampling of B agents as well as the sampling of RN target isotopes, to be analyzed by HBM, in a single sampling approach, thus reducing stress for the potentially exposed persons and facilitating comparison of their individual exposure to different CBRN agents. In addition, human HBM analysis methods are evaluated and basic toxicity data (including biological reference and threshold values) are given for a list of substances, previously identified as relevant in civil protection. In the hands of on scene commanders and health care professionals the new compendium may help to generate HBM and BRN exposure data after a CBRN incident. These data may be used to improve crisis and risk communication and - if necessary - the somatic together with the psycho-social rehabilitation of the potentially exposed disaster relief forces and parts of the general population.

Forensic Aspects in Medical Bio Reconnaissance

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Since the 1990s, a broad spectrum of regional conflicts and crises have evolved that have been accompanied by a growing threat of international terrorism. How vulnerable our modern societies would be towards a covert biological attack became evident in the 2001 anthrax letters attack in the United States. The delay in the diagnosis of the first cases and the long duration of the molecular traceback analysis which finally led to the identification of the perpetrator revealed the gaps in responding to unusual biological events. Against this backdrop, NATO has to consider biological warfare and bioterrorism as a serious threat to its forces. Biothreats are currently associated with asymmetric warfare scenarios and non-state actors rather than with state-driven biowarfare facilities. In such scenarios the deliberate release of a biological agent will most probably remain undetected until a cluster of cases will suggest an unusual outbreak of disease. Major goals of medical bio reconnaissance are to rapidly identify the causative agent of the outbreak and to differentiate between natural and deliberate outbreaks. In contrast to the investigation of overt natural outbreaks, forensic aspects have to be considered and implemented quite from the beginning when unusual outbreaks are to be investigated. All operation should be performed by specially trained medical staff only. The history of patients should be explored and documented on-site. Thorough photographic documentation of the sampling situation and the use of pre-controlled lots of sampling devices are necessary. Samples must be taken in duplicate, sealed, handled and transported to the laboratory following chain-of-custody procedures. Throughout the sampling, transport and subsequent laboratory analysis processes, the legal integrity of samples and data must be guaranteed. Therefore, it is necessary to have an accurate written record to track the possession, handling, and location of samples and data from collection through reporting. If a biothreat agent is detected and unambiguously identified, it may be necessary to enter bioforensic analysis in order to differentiate between natural and intentional outbreaks and to trace back the origin of the agent. Microbial forensics is a relatively new discipline which is mainly concerned with taking molecular fingerprints of biothreat agents by means of sophisticated molecular typing techniques enabling the investigator to identify and trace back a particular strain by comparing it with the fingerprints stored in a typing database. The bioforensic approach may well be capable of elucidating the source of an outbreak as has been evidenced in the Amerithrax case in 2001. In order to detect molecular differences of microbial strains, a number of sophisticated typing techniques are currently employed by the typing laboratories. The data is fed into databases, for example into the Bionumerics database, together with other, e.g. geographical, information on the investigated strains. In the near future, the major challenge in bioforensics will be the development of large databases with internationally standardized typing data and the implementation of guality management.



Product Guide: Bruker

BRUKER CBRNe Detection Equipment and integrated System Solutions

Bruker Daltonics is a leading global specialist producing Chemical Biological Radiological Nuclear Explosive (CBRNe) detection equipment and total solutions. Established 30 years ago, we strive to provide a constantly improving range of sophisticated products. Our instruments are built to the highest standards using state-of-the-art technology, ruggedised designs and supplied with modular accessories. This combination permits ultimate flexibility and wide ranging practical application. We understand that complex scenarios require an integrated system approach and as one of the most experienced players on the market we can provide the right solutions.

The complete product line for detection

CBRN technology is our core competence and Bruker was the first company to provide the complete spectrum of detection equipment. We specialise in developing, engineering and manufacturing military hardened, easy-to-use analytical and integrated system solutions and are ISO9001 certified. The product line includes Mobile Mass Spectrometers, Ion Mobility Spectrometers, FTIR, Radiation Meters, novel explosives and narcotics detection instruments and systems to counter biological threats. Our comprehensive range of products can be used stand alone, fully integrated in to land, air or sea platforms and controlled by software providing a simple and complete common operating picture. Bruker equipment is in service with Military, Homeland Emergency and Civil Defence Forces worldwide.

Mobile and stationary chemical detection

Our RAID series of detectors are multirole, providing personal or collective protection, point, platform or infrastructure Detection, Identification and Monitoring. They use well-established Ion Mobility Spectrometry and all of the important CWAs and TICs can be monitored.

The stand-off detector RAPID is a compact, mobile infrared detector for the real-time remote sensing of chemical agent clouds. CWA and TICs can be automatically identified and monitored at up to five kilometres whilst stationary or on the move. Latest developments link two or more RAPIDs to setup a triangulation system and allow tomographic reconstruction of CWA clouds. With the SIGIS 2, based on the same core technology, Bruker addresses the special requirements of



Emergency Responders providing security at high visibility events.

The MM2 sets a milestone in Gas Chromatography/ Mass Spectrometry (GC/MS) technology with a volume of 43 litres at just 35 kg. Equipped with an improved GC/MS technique it represents the new generation of quadrupole mass spectrometers. The MM2 is optimised for mobile detection and long-term chemical reconnaissance and survey missions in armoured vehicles.

Safety, Security and Environmental protection

The enhanced environmental mass spectrometer E2M is a mobile, compact and lightweight GC/MS system for fast, reliable onsite identification and quantification of organic chemicals from any medium (soil, water, air). The instrument has been developed in close conjunction with the German fire brigade and disaster management authorities. Typical applications of the E2M are Environmental Protection, Mobile On-site Analysis, Event Monitoring, First Responders and Critical Infrastructure Protection.

Each chemical substance has its own infrared signature, just like a finger print. With the new Mobile-IR, it is

BRUKER

Federal Ministry of the Interior



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easy to rapidly identify unknown chemicals, even in the most arduous conditions. Unlike other portable instruments, Bruker's Mobile-IR offers benchtop FT-IR performance, providing wider spectral coverage and higher spectral resolutions. The Mobile-IR is available as a powders and liquids analyser or a dedicated liquid analyser. Its embedded computer with large touchscreen display makes operation easy and OPUS/Mentor software guides the users in every step of the analysis and rapidly identifies the unknowns from the built-in library. Additional libraries can easily be added.2

Biological detection

There is an evident danger from the use of biological agents as weapons and the reliable and fast identifica¬tion of microorganisms is a challenging task in mobile or stationary laboratories. Biotype microorganism identification based on Bruker MALDI-TOF mass spectro¬metry is a software tool that allows the reliable identification of unknown micro¬organisms from their protein fingerprint in the MALDI-TOF mass spectrum by comparing their individual peak lists to the available database. Based on a flexible database approach the data obtained by MALDI-TOF mass spectrometry from cultivated bacterial colonies can be easily analysed.

The pTD, the portable Toxin Detector, provides detection of 5 Toxins in parallel with unmatched sensitivity. The basic technology of electrical sensing of Immunoassays is a unique approach in this market.

Radiation Detection

The Radiation Sentry Backpack provides fast and accurate nuclide identification, dose and dose rate information utilising Bluetooth. The innovative RAID-AFM and RAID-XP provide dual chemical and gamma radiation detection for the operational environment providing CRN evaluation in a single system.

System integration & data visualisation

Our detectors can be easily integrated into any system or platform. We have over 20 years' experience of working with our customers to develop effective system integration and multi-platform solutions. Software tools based on 32bit Windows systems are available for all Bruker Detectors. Graphical User Interfaces are adapted to the customers' needs enabling user-friendly data evaluation visualised by bespoke software programmes adapted for each role.

Customer service and after sales support is taken seriously The production of high quality equipment re-



quires equally high standards of customer service and after sales support. We ensure that all aspects of our service, whether that is supplying consumables, training or technical support; is given equal priority. Efficiency, readiness and flexibility are requirements of our processes and staff alike. The Bruker motto "innovation with integrity" applies to all aspects of the business.

Further Information

Visit our website for full details on our products, solutions and the company www.bruker.com/cbrn

Product Guide: Futuretech

Decontamination systems from Kärcher Futuretech GmbH form the object of a large number of patents and are based on the most modern decontamination and cleaning technologies in addition to highly effective CBRN decontamination agents. These have proven their worth worldwide in many series production standard systems.

TEP 90

With the TEP 90 decontamination system, the German Federal Armed Forces are equipped with the most modern and most efficient system of this type currently available which includes outstanding worldwide leading technologies.



Due to state-of-the-art decontamination methods and agents, the TEP 90 meets all technical requirements and the respective parameters required of a high-performance decontamination system. It has a consistent modular construction and includes all necessary components in the independently usable decontamination modules for mission-optimised thorough decontamination close to the affected troop.

The built-in hydraulic crane system of the carrier vehicle is intended for unloading the individual decontamination modules at the respective decontamination stations. For the decontamination of large vehicles (tanks, etc.), decontamination module 1 remains on the carrier vehicle. For decontamination, a crane basket is attached to crane arm. From this basket, all kinds of vehicles (including ae-

roplanes) can be decontaminated even from above. Decontamination module 2 is fitted with a highly effective vacuum decontamination device for the B and C decontamination of sensitive optical and electronic equipment, etc. Decontamination module 3 is used for the decontamination of persons and, in addition to the shower section, has a special thermo-electrical energy module, a water tank, an air-conditioning unit and an

inflatable tent for undressing and dressing which automatically ensures proper decontamination. The Decon Shuttle (decontamination module 4) is used independently for the decontamination of the interiors of battle tanks, vehicle cabs, helicopters and transport planes, etc.

The TEP 90 was designed in such a way that it can be used at temperatures from -30 °C to +49 °C in the climate zones determined by STANAG 2895 without any restriction. The desired decontamination result can also be achieved under winter conditions using CBRN decontamination agents (RDS 2000, BDS 2000 and GDS 2000) which are suitable for this temperature range.



CBRN decontamination agents

The family of highly effective rapid-action agents developed by Futuretech for the removal of radioactive contamination, inactivation of relevant pathogenic micro-organisms and detoxification of highly toxic chemical warfare agents ensures at the same time a sufficient level of storage stability, agent handling safety, good compatibility with the material to be decontaminated and a minimized impact on the environment. This family of products includes the following decontamination agents:

- **RDS 2000** (N decontamination agent) specific combination of an aqueous surfactant system with appropriate complexing agents, oxidants or other auxiliary substances
- **BDS 2000** (B decontaminant system) based on a special thermally stable peracetic acid; applied in the form of an aqueous foam for the decontamination of surfaces, or in the form of a thermal aerosol for the decontamination of compartment air (interiors)
- **GDS 2000** (non-aqueous C decontamination agent) for the quick and effective detoxification of all known chemical warfare agents (including thickened chemical warfare agents); manufactured industrially, ready for use; with a storage life of over 10 years



FUTURETECH



2012: European Perspectives in an interantional Environment

Product Guide: Futuretech

The new decontamination agents clearly represent the state-of-the-art in the area of CBRN decontamination. They are biologically degradable and suitable for application even under harsh winter conditions.

Lightweight, air-transportable decontamination systems for special forces

For supporting rapid operations involving necessary NBC defence tasks, highly mobile mission forces (airborne units) can use lightweight decontamination systems (LDS - Lightweight Decon System), which are as mobile and tactically flexible as the units to be supported.

This family of lightweight, air-transportable decontamination systems for special forces includes the following four units for the decontamination of

- Persons and personal equipment (LDS/P),
- Sensitive equipment sensitive electronic and optical devices, etc. (LDS/S),
- Material ground vehicles, aeroplanes (LDS/M), and
- Infrastructure (LDS/I).

Using the lightweight decontamination systems, the basic performance requirements of CBRN decontamination can be fulfilled. For example, a paratrooper company (100 soldiers, 15 vehicles) can be thoroughly decontaminated within three hours.

Protected multi-functional vehicles (MUNGO multi-purpose vehicle including loading device) with the respective system trailers are used as carrier vehicles. The decontamination units are specifically designed in such a way that they can also be transported in CH 53 helicopters and other kinds of cargo aircraft.

To ensure water supply for decontamination measures using the lightweight decontamination units, special water transport and supply modules or water transport and energy supply modules are available.

DSSM – Franco-German decontamination project

The procurement of the systems for the decontamination of sensitive equipment for the French Army and German Federal Armed Forces represents an essential contribution of Futuretech in cooperation with a French partner company to bridging the gap caused by the increasingly strong demand for the decontamination of sensitive equipment (as a result of the introduction of modern infantry equipment IdZ1/D and FÉLIN2/F).

The highly mobile decontamination system DSSM ensures the thorough decontamination of sensitive equipment (optical and electronic devices such as radio sets, personal digital assistants, optronics, etc.) and parts of personal equipment (e.g. handguns, combat helmets and parts of the IdZ / SiE3 equipment); decontamination may also be carried out independently when the system has been unloaded from the carrier vehicle.

The system is designed and built for worldwide missions in all climatic zones, for transport on suitable all-terrain vehicles as well as by rail, sea and air. As it consists of proven sturdy modules and assemblies, easy maintenance and repair are ensured, which guarantees that downtimes of the system are reduced to an absolute minimum. In addition, a sufficient stock of decontamination agents and fuel allows autonomous operation for three hours. Thanks to the modular structure of the entire system, the application of the most modern decontamination methods and agents as well as the appropriate integration of standard components, the system for the decontamination of sensitive equipment also fully represents the state-of-the-art in this specific area.

With these examples and an even wider range of decontamination products Futuretech is a specialized system provider of decontamination solutions for any circumstances and offers those according to customer's wishes and requirements. Complete and innovative appliances and perfectly concerted decontamination agents can be combined highly effective for every need. All products are highly mobile, quickly ready for use in all climatic zones, long-living and economical.



2012: European Perspectives in an international Environment

Product Guide: Mirion Technologies

Protection of the public, safety for personnel and obeying the regulations are the fundamental rules that are applied to all organisations working in nuclear industry. It is our mission to supply the means that enable our clients to follow these rules.

Mirion Technologies (RADOS) GmbH in Hamburg is part of the Health Physics Division operating worldwide as one of the five divisions of Mirion Technologies.

With the knowhow of almost 60 years, we develop and produce devices and systems for the measurement of ionising radiation – with particular focus on contamination and clearance systems for nuclear industry.

Further product lines are concerning the detection of radioactive sources in transport or by people.

Our product portfolio is ideally complemented by the spectrometry and dosimetry products of our sister companies in Finland, France and the US.

Of course all our products are coming with the relevant service offer.

Our success is based on innovation, first class research and product development, and on many years continuous cooperation with specialised research laboratories, with independent experts, certification and calibration organisations and customer service on the highest level.

The CheckPoint:Gate[™]-Family

The monitors of the CheckPoint:Gate[™] Family prevent the unauthorised transport or introduction of radioactive or nuclear material.

On one hand the highly sensitive portal and truck monitors detect any radiation above background on passing vehicles or persons. At the same time position and type of radiation are identified.

On the other hand body and luggage monitors on entrance or exit check for possible previous contamination or the unauthorised transport of radioactive material.

Truck Monitors

The RADOS vehicle monitors are flexible and universally deployable measurement systems for gamma sources (optionally extendible to neutron detection) for the round-the-clock monitoring for radioactivity in and around vehicles.

Their most convincing features are the extremely fast data processing. They protect nuclear facilities, national borders, ports or industrial installations, such as steel plants.



FastTrack-Fibre™

The FastTrack-Fibre[™] is no conventional gamma portal monitor. He combines the unique fibre detectors with the FastTrack technology in a compact design and sets new standards for the gamma monitoring of personnel.

The FastTrack technology, i.e. the special configuration of detectors and application of filter algorithms will detect reliably under conditions where a conventional monitor will produce a false alarm or detect a source but is unable to localise it. Thereby the detection process is much accelerated in comparison to conventional technology without compromising detection limits or false alarm rates.

FastTrack-Vehicle™

The FastTrack-Vehicle[™] monitor uses the same technology as developed for the FastTrack-Fibre[™]. This allows detection of radioactive sources at high speed and the filtering of radiation events that are not related to the truck moving through the monitor.

The compact design of the monitor allows the deployment of the monitor without the need to use special lifting gear such as cranes.

DnD-Portal™

The DnD-Portal[™] is based on an extraordinary deployment concept: a modular and transportable monitor is able to be configured for either personnel or vehicle monitoring including trucks. Depending on the scenario he is deployed in very short time. The applications range from reaction to terroristic threats to first screening after a radiologic accident or the ordinary monitoring of entrance or exit of nuclear facilities.

The SPIR-Family

The SPIR products of our sister company Mirion Technologies (MGPI) SA in France have been developed for the monitoring of areas and infrastructures against radiological dangers, such as the migration of nuclear ma-







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Product Guide: Mirion Technologies

terials or the spread of radioactive contamination. They differ from the CheckPoint:Gate™ products in that they are able to identify various isotopes through spectroscopic measurements.

Spir Detect

The SPIR DETECT works on the basis of the HDS-100G/GN and can be used to deploy a network of gamma and neutron detectors. The system offers the discrete and central integration of entrance points and is because of its mobility ideally suited for the deployment inside or outside buildings.

The inconspicuous SPIR DETECT has been used in airports for the personnel or luggage screening in train stations or for large events.



HDS-100G/GN

The handheld HDS-100G or GN detects gamma and neutron radiation. The detected isotopes are identified and can be associated with medical or industrial use or be classified as naturally occurring or fissionable, nuclear material.

It has been used for customs purposes or by other organisations fighting the unauthorised transport of radioactive materials. It can be used for the localisation and identification of sources that have been detected by a portal monitor.

SPIR ID

The Spir ID is a robust handheld device for the efficient search for radioactive materials or the detection of threats such as dirty bombs in passing. It is suitable for the use by border police or customs, security personnel of critical infrastructure or large area surveys after nuclear incidents.

- Real time identification
- Large Nal(TI) and LaBr3 detector versions
- · Gamma and neutron channels
- Simple user interface
- Robust design
- · Integrated GPS and wireless options

PDS – radiometer in pocket format

The PDS-100G or GN and PDS-100G/GN-ID have been developed for the use by police, fire brigades and customs for the quick localisation and quantification of radioactive materials.

The PDS-100 are gamma and gamma/neutron detectors with the ability to identify nuclides (PDS-100G/GN-ID, or PDS-100G/GN + Software SMI) and collection of spectra which can be displayed via the PDSmass Software.

The devices are very compact and can be worn on the belt. Their main feature is the high sensitivity to radiation, where they perform much better than demanded by ANSI specifications (N42-48 SPRD). The high sensitivity serves the quick detection (and identification - PDS-100G/GN-ID).

SPIR IDENT

The SPIR Ident is the best performing device of the SPIR-Family. He is also detecting and identifying gamma sources and fissionable materials. Thereby he can automatically distinguish between false alarms and genuine alarms in real time.

The SPIR Ident is available as SPIR Ident Vehicle, SPIR Ident Pedestrian or SPIR Ident Mobile.

Software for spectrometric products

SMI (Spectrum Management and Identification)

SMI is software for the handling and analysis of spectra recorded by the Mirion spectrometric products. It can be run offline and displays the spectra generated by SPIR Ident, HDS and PDS and analyses them. Spectra can be displayed simultaneously.

RadiaMap

RadiaMap is a software for the handling of spectra a displaying them in a cartographic context. It can be used with all SPIR devices, HDS and PDS. A network of various installed and mobile devices can be deployed for area monitoring. RadiaMap is based on Google Maps and Google Earth.



Product Guide: PDX

COMPANY:

Pursuit Dynamics Plc. (PDX) is a UK based intellectual property and Technology Company that is actively commercialising its Vapour Jet Technology and Raptor Technology based products within multiple market sectors. Our patented products and technologies provide efficient and innovative industrial processes that help meet today's sustainability and economic goals.

CBRN GENERAL:

The modern CBRN threat faced by the military is now basically the same CBRN threat faced by the civilian populace. As nations find themselves tackling a more asymmetric type of CBRN warfare that transverses national and corporate boundaries, the threat of CBRN attack has increased.

The need for fast, flexible and responsive detection and decontamination systems is omnipresent. The contamination requirement is particularly important if nations are to safeguard their populace from significant physiological and financial burden. Given the lethal effects that CBRN materials can have on the human anatomy which are wholly disproportionate to their size future CBRN decontamination systems need to be flexible and mobile enough to respond to any terrorist and limited release level threat.

PDX decontamination products support emergency responders across the globe, providing rapid and effective full spectrum CBRN decontamination with minimal liquid use.

Broad chemical capability, coupled with super-fine droplet generation and complete non-line of sight coverage, affords complete CBRN threat mitigation within a single PDX system.

We provide portable and mobile decontamination solutions both being equipped with our patented Vapour Jet Technology that generates micro droplets to ensure even and consistent coverage. Covering the entire CBRN threat spectrum PDX Vapour Jet Technology is compatible with diverse range of decontaminants including:

Liquid Decontaminants (Chemical & Biological Applications)

- Alkoxides (0.1-5%)
- Hydrogren Peroxide (0.1-30%)
- Hypochlorous Acid (0.1-1%)
- Peracetic acid (0.1-5%)
- Peroyxgen acid esters (1-5%)
- Chlorine Dioxide (0.1-1%)
- Sodium hypochlorite (0.1-20%)
- Potassium Peroxymonosulfate "Oxone" (0.1-1%)

Polymeric & Radiological Complexants (Radiological & Nuclear Applications)

- Strippable Coatings (e.g. PVA-PVP with "Chelating-agents")
- · Fixatives [e.g. Sulphated Butyl esters or vinyl acetates
- Sequestering liquids (e.g. EPTA or DTPA)

Chemical

Capable of delivering all standard CBRN decontaminants, PDX Vapour Jet Technology has independently proven decontamination capability against most chemical warfare agents: high log kill effectiveness against a range of airborne and surface contaminants (line-of-sight and non-line-of-sight surfaces), including Sulphur Mustard (HD) and Organo-Phosphorous nerve agents.

Biological

Capable of delivering all standard CBRN decontaminants, PDX Vapour Jet Technology has independently proven disinfection and decontamination success against most biological warfare agents: high log kill effectiveness against a range of airborne and surface contaminants (line-of-sight and non-line-of-sight surfaces), including Swine flu and other viruses, MRSA and Anthrax. Illustrated below are typical microbial reduction levels afforded by PDX Vapour Jet Technology when challenged against various anthrax simulants. The chemistry used in these test was 0.25% Peracetic acid.

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Federal Ministry of the Interior



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an interantional Environment

Product Guide: PDX

Test Organism Bacillus cereus Bacillus subtilus Bacillus pumilus Bacillus globigii Bacillus thuringiensis

Average Log Kill (15Mins) 8.01 (99.999999%) 5.94 (99.9999%) 5.65 (99.999%) 6.97 (99.99999%)

3.64 (99.99%)



Radiological

Capable of delivering a range of polymeric materials (strippable coatings) which can be used to decontaminate radio chemically contaminated surfaces. PDX Vapour Jet Technology is being utilised for the simultaneous knockdown of airborne radiological particles and surface tie down. These could be both short range particulate hazards e.g. 1311, 137Cs, 241Am, Pu and isolation of highly mobile species such as 137Cs, 90Sr etc. It has particular application for the treatment of large volumes, or for spaces involving complex shapes and hard to reach areas.

PDX PRODUCTS:

First Response System (FRS-C)

Offering lightweight and cost effective decontamination the FRS-C is a highly mobile and robust back pack designed for maximum operational flexibility. Designed to allow emergency personnel to work effectively in both confined and remote environments the FRS-C incorporates PDX Vapour Jet Technology creating a superfine mist to ensure even and consistent coverage. Rapidly projecting these droplets in the form of a dense and turbulent mist the FRS-C is capable of delivering

CBRN decontaminants to all non-line of sight surfaces. The FRS lance can be easily directed and controlled. The superfine mist ensures haptic dry surfaces. There is no damage to sensitive and electronic equipment which can stay functional throughout decontamination process. Drastically reducing both the chemical foot-print and time required for effective decontamination.

This combination affords minimization of the decontaminant mass per unit of application whilst maintaining an efficient surface and airborne decontamination capability

The perfect CBRN decontamination solution for localized environments, light vehicles and personnel the FRS-C has the following features and functions:

- · Robust, lightweight and easy clean design for tough environments
- 4 litre fluids vessel
- Powered by a standard 6 litre 300 bar air cylinder
- · Gas and fluid re-fill in position capability
- Less than 20kg total weight (full)
- 2 minute run time
- · Compatible with a wide range of decontamination chemistries

Area and room decontamination (D800)

Our larger integrated wide-area (~2000m3) solution combines our technology with true operational level decontamination capability and excellent rapid room filling capacity.

Suitable for large scale infrastructure and heavier items of military equipment the mobile stand-alone system compliments the FRS in providing the end user with a complete CBRN capability. PDX continues to contribute to important advances in aerosol delivery and decontamination technology. The D800 is portable, requiring minimal operation (maximum two people). Ground clearance (> 200 mm) is adequate to allow all terrain usage including ramped entry into buildings and movement over rough ground (e.g. battlefield and urban environments) etc. Removal wheels allow a skid-capability version. A Brake facility is provided to allow to be positioned securely during use and storage. The system has separate delivery hoses to minimize cross-contamination in hot-zone. The D800 is suitable for lifting with conventional forks, trucks and associated military-emergency response vehicles (carriage hook).



Product Guide: Smith Detection

Smiths Detection is a security and defence company that provides government regulated technology products and services for the detection of chemical, biological, radiological, nuclear and explosive threats as well as other dangerous or illegal material such as narcotics. Over the last few years, the company has invested over \$500m on research and development to address challenges confronting leading organisations, including the US Department of Energy (DoE) National Laboratories, the UK Health Protection Agency (HPA), the International Atomic Energy Agency (IAEA) and National Defence Agencies around the world.



In 2012 Smiths Detection released GUARDION[™], the next-generation miniaturised chemical threat detector and identifier, combining high speed, high-resolution gas chromatography (GC) and a miniaturized toroidal ion trap mass spectrometer (MS) in a portable device.

The revolutionary GUARDION, which greatly enhances military and emergency response capabilities in the field, can confirm the presence and identity of chemical warfare agents and toxic industrial chemicals in gases, vapours, liquids and solids.

In 2011 Smiths Detection released RadSeeker[™], a result of a successful collaboration with the US Domestic Nuclear Detection Office (DNDO). RadSeeker is the next-generation radionuclide identifier with enhanced capability to distinguish radiological and nuclear threats and eliminate the background "false positives" produced by naturally occur-

ring radiation or other legitimate everyday radiological materials. Its advanced performance, small size, durability and communications capabilities provide defenders and first responders with the most advanced handheld system to perform search operations, screenings at port and borders and respond to emergency situations that include nuclear material or "dirty bomb" threats.



Also released in 2011 was Sensa-LINX[™] an easily deployable, wireless communications system for Smiths Detection chemical warfare agent and toxic industrial chemical sensors, including the LCD 3.3 - the most widely deployed personal detector in the world. Sensa-LINX improves both situational awareness and early-warning response to chemical attacks by transmitting sensor data to a Command and Control (C2) post. It also enables deployed sensors to be controlled remotely, minimising risks of exposure. Smiths Detection's continued investment in R&D, collaboration with leading worldwide organisations and their flexibility to enhance technology and engineer solutions to integrate into fielded systems, play a key role in helping armed forces and responders confront CBRNE threats today, as well as prepare them for emerging threats in the future. Visit Smiths Detection on stand no. B23. www.smithsdetection.com





Product Guide: Thermo Fisher

Innovative Radiation Measurement Technology

Thermo Fisher Scientific Messtechnik GmbH as a part of Thermo Fisher Scientific Inc., – for more than fifty years – has been working in the development, manufacture and sales of radiation and environmental monitoring and measurement technology. Radiation protection in all sectors, the stationary measuring networks of the Deutscher Wetterdienst (= German Meteorological Service), the federal offices and authorities for environmental protection or the measuring networks of nuclear power plants – all these authorities and industrial facilities are equipped with systems manufactured by Thermo Scientific. Ever since the Bundeswehr (Federal Armed Forces) came into existence, the Erlangen based company has been partner of the NBC-defence and has been covering the equipment

needs regarding military and civil defence radiation measurement technology.

The modular SVG2 system represents the technical response to a nuclear threat – a threat that could possibly arise out of terrorism or of other regional conflicts. The SVG2 system is now the third generation of military radiation detection systems that is now use in the German Federal Armed

Forces and other NATO forces.

SVG2 System



The SVG2 system consists of the SVG2-Kit, the Radiation Protection Kit for SVG2, the Supplementary Kit for SVG2 and the tracking instruments SVG2 for vehicles (e.g. TPz1 NBC reconnaissance vehicle, scouting vehicle le 4 Rad Fennek, le A/C scooting vehicle Mungo 3, PATRIA and others). With this kind of application, two external probes mounted to the vehicles are controlled by the SVG2 basic unit via a switching electronics. The intelligence of the SVG2 systems allows the measured quantities to be automatically converted into values H+t. A specially modified SVG2 is used on frigates and submarines. The SVG2 system detects α , β , γ and n- radiation. The NBR- detector of the Radiation Kit detects very sensitively "artificial" gamma radiation. The α - β - γ probe

detects simultaneously α , β and γ radiation. A typical application is investigation of drinking water, nourishment or discovery of contaminated surfaces.

SVG2 Training System



The new radiac training system is a scenery based simulation of radiological events for realistic training with radiacs without use of radioactive sources or radios. The system is now realized for the SVG2. The training scenarios will be created in a scenario software platform using a movable map.

Three scenarios can be constructed: 1 up to 3 radioactive point sources or the plumes of a dirty bomb or of a nuclear detonation. The grid of the coordinates with local values of dose rate will be converted to a data file and transferred to a PDA via SD card. Connected to the SVG2 the PDA software selects the trai-

ning data in compliance with the GPS coordinates of the PDA. The PDA software converts the dose rate data to a statistic pulse distribution. These pulses will be finally transferred to the SVG2 via the IR interface. The simulation mode of the SVG2 uses these data as if they came from the detector directly. Realistic training scenarios in LLR as well as in tactical dose/dose rate modes for single or group training can be easily performed with this advanced mobile training system.

The design of the SVG2 training system was supported by the German Armed Forces Scientific Institute (WIS), Munster.

MDS GN: LLR Detection from Helicopter or Vehicle

Another modern tool used for detecting and tracking artificial gamma radiation out of a helicopter or a vehicle is the MDS GN (Mobile Detection System). A highly sensitive scintillation detector detects a significant artificial gamma radiation on the ground even if the helicopter is travelling at high speed. The GPSaided system visualizes the measured values on the moveable map display on the screen of a notebook every second. The colours of the continuously entered points represent adjustable alarm thresholds. This way, location and intensity of an unknown radioactive source or a radioactive contamination can be determined very quickly.







Product Guide: Thermo Fisher

The NBR-technology which is used here as well leads to expressive measurement results differentiating between artificial and natural gamma radiation. Additional He-3 detectors allow simultaneously the detection of neutrons.

MPMS for stationary neutron and gamma detection

The Modular Portal Monitoring System MPMS is used for the detection of radioactive hazardous material to monitor entrance areas and field camps. This dual sensor system for the detection of neutrons and gamma radiation is the result of a co-operation between the Federal Armed Forces Scientific Institute in Munster (Germany) and Thermo Fisher Scientific Messtechnik GmbH. The system is either used for personal surveillance or to check vehicles. The NBR (Natural Background Rejection) method enables the fast detection of artificial gamma radiation in the range of few nSv/h independent of the natural background. With the tripod of the MPMS it is possible to set up the system even in rough terrain up to a height of 2.5 meter. Via radio or cable the measurements are then sent to a Computer. The software allows the management of up to 20 MPMS systems in parallel in pairs of two each.

On-site Identification of Explosives and Hazardous Substances



Rapid, precise identification of explosives and chemical hazards is one of the key tasks for homeland security, military and public safety personnel, especially with the marked increase of improvised explosive device (IED) usage worldwide. Instruments that can be used in the field to rapidly and accurately identify various explosives – and their precursors – are essential tools for bomb technicians responsible for the safety and security of the community. Thermo Scientific and their exclusive distributor for Germany and Austria analyticon instruments gmbh offer a chemical identification toolkit with complimentary analytical possibilities: FirstDefender RM/ RMX, based on Raman spectroscopy, and TruDefender FT, a Fourier Transform Infrared (FTIR) spectroscopy

unit. Each instrument and technology offers distinct advantages in specific ex-

plosive applications, and when used together extend the capabilities of the bomb technician's toolkit providing more rapid and specific identification results that a responder can rely on.

Key Benefits include:

• Fast, accurate identification,

• Non-contact measurement through transparent containers (Raman only),

- Vast substance library, easy to update in the field,
- Automatic mixture analysis,
- Built for field use; rugged and MIL-STD 810F tested,
- Lightweight, ergonomic design; flexible use modes,

• Multiple power sources: rechargeable battery, wall plug, or SureFire disposable batteries,

• Easy to use; clear output – no user interpretation required,

- Point-and-Shoot analysis, non-destructive testing,
- No scheduled maintenance or calibration required,
- Robot mountable, remote controlled (Raman only) and
- Wireless transfer of data (TruDefender FTi only.)

Raman for Explosives

Raman spectroscopy enables users to safely analyze explosive materials through sealed translucent containers without disturbing the sample. This capability is especially important for bomb technicians who want to avoid contact with a sample wherever possible.

New Detection & Identification Technology #1 time in Europe !







Product Guide: Thermo Fisher

The instruments are able to recognize thousands of potential explosives including but not limited to: TATP, ammonium nitrate, TNT, RDX and HMTD. Additionally, FirstDefender RM/RMX capable of identifying explosive precursors in liquid mixtures. FirstDefender RM/RMX collects the molecular fingerprint of an unknown sample, then compares the substance against the onboard chemical library (>11.000 chemicals), often providing results in a matter of seconds.

FTIR for Explosives

Certain explosive materials and their precursors have the potential to display fluorescence which can "disguise" the spectral fingerprint of a material. FTIR is ideal for potentially fluorescent samples because of the way FTIR spectroscopy interacts with an unknown sample. TruDefender FT will not cause a material to exhibit this phenomenon.

TruDefender FT does not generate energy during the sampling process, which makes it an ideal tool for verifying substances such as: Red Dot, smokeless powders, Pinkor Green Detasheet, Semtex, or hundreds of other colored materials. Since contact is required between the sample and the instrument, pressure sensitive materials should be measured noncontact e.g. with a Ramanspectrometer.

About FirstDefender RM/RMX



FirstDefender RM/RMX is a lightweight, MIL-STD-810F rugged Raman instrument for rapid (typically within 30 seconds) and accurate non-contact identification of thousands of chemicals, including explosives, narcotics, chemical weapons, toxic industrial chemicals (TICs) and more. Weighing less than 1 kg, FirstDefender RM/RMX is a ground-breaking addition to a first responder's toolbox, and deployed around the world by military, EOD/IED specialists, hazmat teams, and law enforcement

organizations.

FirstDefender RM and RMX are the next generation Raman instruments, with about half the size and weight of the well-known FirstDefender, measuring up to five times faster. FirstDefender RMX has a fixed fiber optic probe to measure in hard-to-reach locations, and can ea-

sily be connected to tactical robots through the integrated RS232 port.

About TruDefender FT and FTi

TruDefender FT is a handheld FTIR system designed to identify unknown chemicals directly in the hot zone. Built for first responders, TruDefender FT weighs only 1.3 kg and is rugged enough to withstand the rigors of field use.

Using industry proven FTIR technology, TruDefender FT complements FirstDefender to maximize in-the-field coverage of an even broader range of unknown chemicals. Its onboard hazard database includes thousands of unique substances, and provides full safety and treatment information. TruDefender FT is designed for use by first responders, bomb technicians, hazmat teams, homeland security, military and law enforcement personnel.

TruDefender FTi is based on the well accepted FTIR technology and is equipped with the possibility of wireless communication. Data can be sent by text message or E-mail out of the "hot zone" to operation control or other assistance.



Refreshments / Lunch / Dinner

Dienstag, 23. Oktober		Mittwoch, 24. Oktober	
Zur Begrüßung:	Plundergebäck (süß und herzhaft) Bircher Müsli	Zur Begrüßung:	Vanillejoghurt mit Amarenakirschen Schokocroissant
1. Kaffeepause:	Bagel mit Tomate und Mozzarella luftiger Joghurt mit Maracuja	1. Kaffeepause:	Quiche mit Speck und Zwiebeln Mini-Donut
Mittagessen:	Berliner Gurkensalat hausgeräucherter Butterfisch auf Linsensalat Rindfleischbällchen auf Basmatireis mit Tandoori-Dip Graupenrisotto mit sautierten Waldpilzen Marillenguiche mit Zimtschaum	Mittagessen:	gegrilltes mediterranes Gemüse Streifen vom Wiener Backhändl mit Kartoffel-Gurken-Salat Rindergulasch mit saisonalem Gemüse und Butterspätzle überbackene Cannelloni mit Spinat und Ricotta Apfel-Ricotta-Kuchen
2. Kaffeepause: Abendessen:	Latte-Macchiato-Creme Erdbeer-Tiramisu im Glas Blattsalate mit Kirschdressing und Kräutercrostini	2. Kaffeepause:	Tiramisu im Glas Blechkuchen mit Kirsch und Schokolade
	Warm geräucherte Putenbrust mit Sellerie- Karotten-Salat Gulaschsuppe mit Brötchen Schnitzel "Wiener Art" mit Kartoffel- Gurken-Salat Kartoffelsouflee mit geschmorten Waldpilzen und Schnittlauch New York Cheesecake	Getränke (ganztägig):	Kaffee / Tee, Apollinaris Vio, Apollinaris Selection Granini Apfelsaft, Granini Orangensaft
Weine:	Grillo Terre dell`Isola, Merlot Terre dell`Isola.		
Bier:	Beck's Pils		



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Federal Ministry of the Interior



The 2nd International Symposium on Development of CBRN-Defence Capabilities 2012: European Perspectives in an interantional Environment

Upcoming Conferences

Perspektiven der Verteidigungswirtschaft



Das Symposium "Perspektiven der Verteidigungswirtschaft" geht im Jahr 2013 in seine 6. Auflage. Es hat sich bestens bewährt, findet große Resonanz und hat seinen festen Platz als Auftaktveranstaltung im Kalender der DWT gefunden. Das Symposium spricht seinem Format folgend unverändert eine Reihe wichtiger, zukunftsorientierter, nationaler sowie internationaler Themen an, die für sich alleine meist keine eigene Veranstaltung begründen würden. Das Symposium wird 2013 durch eine Ausstellung begleitet.

Modellbildung und Simulation



Modellbildung und Simulation (M&S) unterstützt umfassend und querschnittlich sämtliche Fähigkeiten der Bundeswehr und trägt somit zur Verbesserung der Fähigkeiten im gesamten Fähigkeitsprofil – Führungsfähigkeit, Nachrichtengewinnung und Aufklärung, Mobilität, Wirksamkeit im Einsatz, Unterstützung und Durchhaltefähigkeit, Überlebensfähigkeit und Schutz – maßgeblich bei. Das Forum soll sich mit dem Sachstand, den Perspektiven und Chancen und den Realisierungsmöglichkeiten von Vorhaben und Entwicklungen befassen, die zum Fähigkeitsprofil der neuen Bundeswehr beitragen. Wie auch bei den vorherigen Veranstaltungen wird Unternehmen die Möglichkeit geboten, die eigenen Fähigkeiten im Rahmen der Ausstellung zu präsentieren.

Veranstaltung mit Dt. Militärattachés 2013

Die Veranstaltung findet am 21. Mai 2013 im Weingut Kloster Marienthal im Ahrtal (in der Nähe von Bonn) statt. Mit diesem Event eröffnet sich erneut die Chance, mit deutschen Militärattachés ins Gespräch zu kommen, entsprechende Kontakte aufzubauen oder zu pflegen. Da die letztjährigen Veranstaltungen in kürzester Zeit ausgebucht waren – es stehen nur eine begrenzte Anzahl an Ausstellungsständen und Teilnahmemöglichkeiten zur Verfügung – ist in jedem Fall eine zügige Anmeldung angeraten. Die Veranstaltung der DWT und des AKM wird durch die SGW organisiert.



Unmanned Vehicles IV

Die Charakteristika der militärischen Konflikte und Bedrohungen haben sich in den letzten Jahren dramatisch verändert. Die Einsätze der Bundeswehr erfordern hochflexible und hochmobile Streitkräfte. Um diese Herausforderungen zu bewältigen, müssen immer ausgereiftere Technologien eingesetzt werden, damit bei weniger Personal die gestellten Aufgaben mit der höchstmöglichen Effizienz und Effektivität gelöst werden können. Vor diesem Hintergrund kommt unbemannten Systemen in Luft/Raum, zu Lande und auf See sowie den dafür erforderlichen Technologien eine immer größer werdende Rolle zu, die im Rahmen des Forums umfassend besprochen werden. 2011 nahmen rund 600 Besucher und 45 Aussteller an dem hochkarätigen Forum teil.



Neuausrichtung LogSysBw

die Neuausrichtung der Bundeswehr führt zu nachhaltigen Reduzierungen bei Strukturen, Umfängen und Anzahl von Produkten. Die getroffenen Strukturentscheidungen lassen eine deutlich veränderte Nachfrage nach Versorgungsartikeln, geänderte Mengengerüste für Lagerungs- wie auch Transportbedarf erwarten. Die Maßnahmen zur Weiterentwicklung der Logistik müssen all diese Auswirkungen auf das Logistische System der Bundeswehr (LogSysBw) bewältigen können. Das LogSysBw wird sich daher künftig auch vermehrt auf Leistungen nationaler und multinationaler Agenturen sowie der gewerblichen Wirtschaft abstützen. Schwerpunkte werden "Sachstand Neuausrichtung Logistik", "Gewerbliche Leistungserbringung" und "Ausgestaltung der Betriebs– und Versorgungsverantwortung" sein.



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