2/2013

Newsletter

Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence

Content

Newsletter

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Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence

Dear Reader,

This second COE newsletter of 2013 reports on a period marred by the sudden and unexpected demise of our much respected and widely popular Hungarian colleague, the Deputy Commander of the JCBRN Defence COE Colonel Janos Zeleňák. His unstinting efforts at the COE are carried on by his former colleagues nonetheless and we are particularly honoured to be dedicating our former briefing room to his memory; The Janos Zeleňák Conference Room will be formally opened during the September 2013 Steering Committee meeting.

It has been a turbulent period in many respects for the COE following the decision to forge ahead with an ambitious programme of restructuring which was completed on July 1st, even as the experimentation period which led to the concept for the new structure was still ongoing. These actions reflect the collective determination of the COE to start to provide useful and effective support to NATO operations in addition to continuing the long-standing programme of work in support of NATO's transformation. The new structure has grouped together the COE's Modeling and Simulation Section with a new Operations and Plans Team and a new Reach Back Coordination Element (RBCE), all of which are now part of the recently created Operations Support Department (OSD).

With effect from September 2013 the OSD will be commanded by Colonel Xavier Lefebvre following another important day in the history of the JCBRN Defence COE, 23 July 2013 when the Republic of France became a new member, increasing the number of Sponsoring Nations from eleven to twelve and making our COE the fourth largest of the eighteen accredited COEs in NATO. The signing ceremony took place in Brussels, organized by our Framework Nation the Czech Republic and led by MG Jiri Baloun. All of the Sponsoring Nations Military Representatives together with the Allied Command Transformation representative and French Military Representative signed the respective Notes of Joining to participate in the two Memoranda of Understanding which underpin the COE, the Operational MOU and the Functional Relationship MOU. MG Jiri Baloun in his opening speech declared that he was "honoured that France decided to join the JCBRN Defence COE as a Sponsoring Nation", adding that the French nation's presence and technical expertise becoming available represents a significant milestone for the organization and declaring his confidence that French contributions to the COE and NATO in the CBRN arena will be significant.

Through the coming months as the new structure beds in the main focus for the whole COE will be on developing and building the CBRN Knowledge Base, a key part of our efforts to improve information management which is ultimately necessary for a comprehensive Reach Back and Fusion capability to be in place for NATO.

On behalf of the Director I would like to express gratitude to the many organizations and people throughout NATO that have supported the JCBRN Defence COE so enthusiastically and effectively in the recent months. That said there are key positions yet to be filled in order for the new structure to become fully effective and all NATO nations and eligible partners are urged to consider joining our COE at this important time.

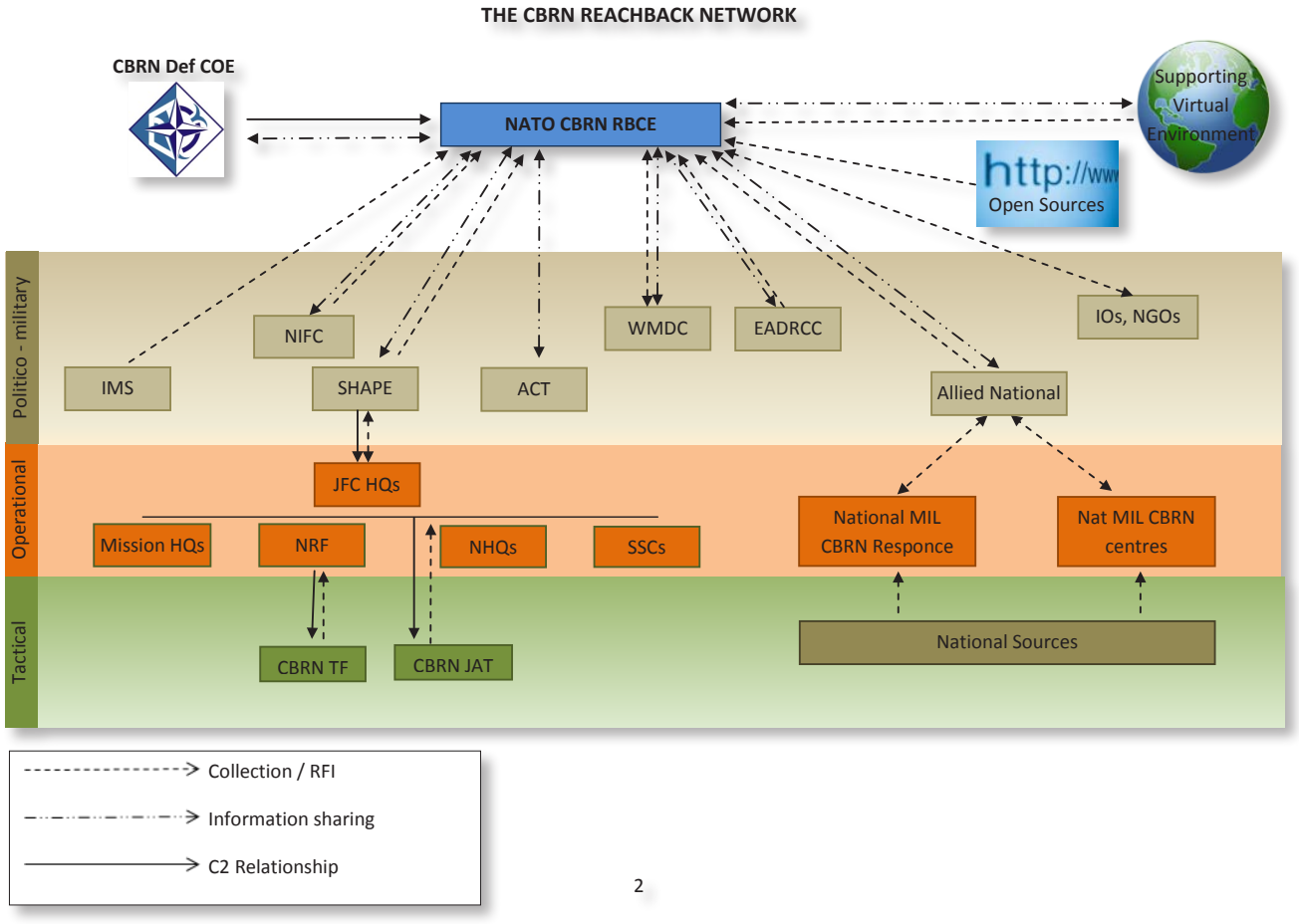
Author: LTC David Cooper OBE MSc (GBR) (on behalf of Director OSD)

Chemical, Biological, Radiological and Nuclear Reachback and Fusion – a New Capability for NATO

The requirement for NATO to have access to its own dedicated CBRN Reachback was first conceived in 2004 but it was NATO's Comprehensive Strategic-Level Policy for Preventing the Proliferation of WMD and Defending Against CBRN Threats published in September 2009 that articulated the requirement sufficiently for work to begin in earnest to implement such a capability. That policy acknowledged that comprehensive information gathering and consistent assessment is an essential aspect of WMD intelligence and CBRN Reachback which together encompass operational or tactical detection and characterisation of a CBRN threat, characterisation of WMD facilities and forensic attribution.

When the comprehensive policy was published it was widely acknowledged that an effective CBRN Reachback process provides an essential contribution to the whole spectrum of NATO's response to WMD proliferation, protection and recovery. Thus the next step towards implementation began with the publication of NATO's CBRN Reachback and Fusion Concept (MC 0590) in May 2010. By this time the Czech Republic, drawing on its long experience and acknowledged effectiveness in the CBRN field had already volunteered to act as host nation for the emerging capability. By March 2011 analysis carried out by the Joint CBRN Defence Centre of Excellence (JCBRN Def COE) based in Vyskov, Czech Republic had outlined a possible method of delivering the capability and identified that, given some structural changes and an uplift of capability, the COE itself would be an effective option for the location of the facility. The synergy between the COE's mission and tasks and the required deliverables of Reachback was clear and thus in September 2011 the JCBRN Def COE Steering Committee approved a two year period of experimentation aimed at informing the further development of the concept with a view to implementing CBRN Reachback at the COE.

The hypothesis behind the ACT-led experimentation was that a CBRN Reachback and Fusion capability at JCBRN Defence COE could enable the CBRN related issues within the NATO Crisis Response Planning Process at NATO HQ, SHAPE, JFCs and other operational headquarters to be supported effectively. This hypothesis was tested with some rigour, not least in a Maritime Interdiction Operations experiment with C2 provided by NATO's Maritime Ops Centre in 2012 which demonstrated clearly that the JCBRN Def COE was able to handle Requests for Information, outsource them where necessary and subsequently respond. During this key part of the experiment technical and scientific advice was provided by the USA's National Nuclear Security Administration, already a committed partner to the NATO CBRN Reachback effort. The importance of a secondary network of such partners was identified at an early stage and the diagram below illustrates how the network might look when developed to the full.



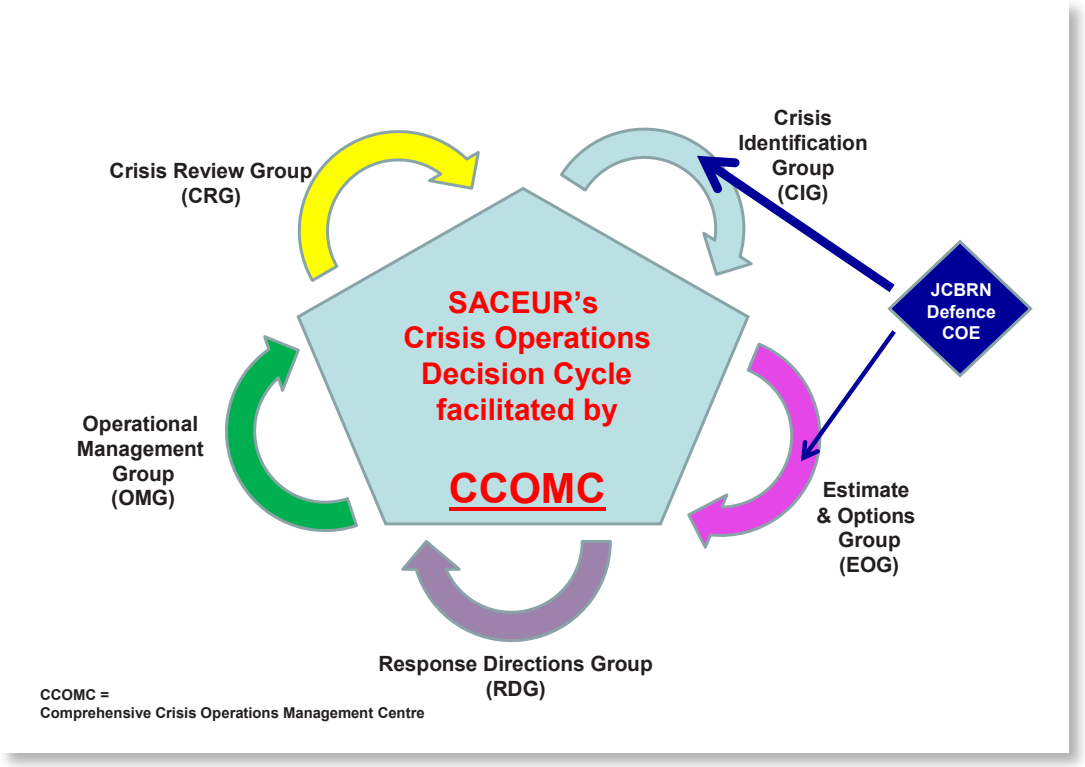
In April 2013 the JCBRN Def COE Steering Committee made a decision to forge ahead with an ambitious programme of restructuring which was completed on July 1st, even as the experimentation period for Reachback was still ongoing. These actions reflect the collective determination of the COE to start to provide useful and effective support to NATO operations in addition to continuing the long-standing programme of work in support of NATO's transformation. The new structure has grouped together the COE's Modeling and Simulation Section with a new Operations and Plans Team and a new Reachback Coordination Element (RBCE), all of which are now part of the recently created Operations Support Department (OSD). Through the coming months as the new structure beds in the main focus for the whole COE will be on developing links to partners in the Reachback network whilst also building a CBRN Knowledge Base, a key part of the efforts to improve information management which is ultimately necessary for the comprehensive Reach Back and Fusion capability that NATO requires.

External partners continue to be sought and added to the Reachback network (the supporting virtual environment in the above diagram) for the outsourcing of Requests for Information where necessary and this extensive network of partners is being established formally, through MOUs and Technical Arrangements, in order to share information and advice on all aspects of CBRN. As the network develops the coordinating element at the COE will become better advised and informed and thus migrate towards maximum effectiveness. Full Operational Capability is planned for the end of 2015. In the interim period, an initial capability is to be established at the end of 2013 by when the set up within the COE will consist of a Chief of NATO CBRN Reachback who will coordinate the activities of a staff consisting of operations and intelligence staff officers, database managers and the all important specialists - one chemist, one microbiologist and one radiological / nuclear scientist. With these personnel in place the embryonic capability will begin to deliver support to its primary customers, identified so far as the Crisis Identification Group and Estimate and Options Group. The contribution of these two groups within the crisis decision cycle is illustrated below.

It has been identified that these two groups in particular will often require specialist CBRN support to enable effective decision-making. There is already an established Request for Information (RFI) process and the Reachback element at the JCBRN Def COE will follow these common NATO procedures.

To help facilitate the Reachback operations centre which is currently being established at the COE, NATO's Defence against Terrorism (DAT) programme of work has already agreed to contribute funds as part of its annual round of allocations which followed a bidding process that took place in London, UK in April 2013. This decision reflects the importance given to countering the proliferation of WMD by the anti-terrorist community as a whole. Considerable structural changes have already been made within the COE and extra posts, not least the technical and scientific specialists already named are necessary to ensure that the COE can deliver an effective Reachback capability. The DAT money is required for IT and office equipment which will enable an operations room and offices to be established at the COE. In short, the COE provides the manpower and office space whilst the DAT funding is used to equip the operations room in order to get the capability up and running. Contractors from three different countries are already engaged in the bidding process to provide communications infrastructure and a situational awareness suite.

CBRN Reachback and Fusion is a capability that has taken time to develop in the conceptual sense but the JCBRN Def COE is now poised to begin to deliver valuable specialist support to NATO's planning and conduct of operations. ACT has provided unstinting support and advice through a lengthy period of experimentation and development to bring the capability to this point and the COE acknowledges this major contribution.



The JCBRN Defence COE is situated on the fringes of the battlefield at Austerlitz, often acknowledged as Napoleon Bonaparte's most masterful victory. It is apt then to remember what has been achieved with CBRN Reachback to date but also to be guided by the words of Le Petit General;

"Take time to deliberate, but when the time for action comes, stop thinking and go in."

Author: LTC David Cooper (GBR)

Joint CBRN Defence COE – Hub for CBRN Education and Training

NATO's Smart Defence and its initiative for the new concept for Centres of Excellence anticipates a more proactive role within the E&T Programme Framework. The need for changing the system and synchronizing the effort is driven by:

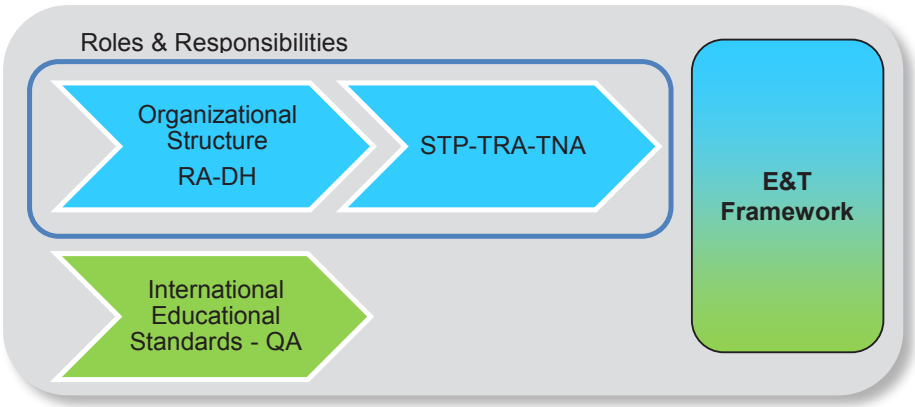
- *More strategic approach*
- *Increasing number of Training Institutions*
- *Increasing number of E&T events*
- *Alignment with international educational standards*
- *New Training Management Tools*

As of 1 December 2012 the responsibility for executing collective training was transferred from ACO to ACT. Therefore, ACT prepared a new coherent, integrated and globally programmed range of education and training for the militaries of Allies and Partners. In parallel, both strategic commands SACT and SHAPE presented NATO's WMD/CBRN Education and Training Plan as a tool for training NATO Deployable Forces ability to defend against CBRN threats and prevent proliferation of WMD.

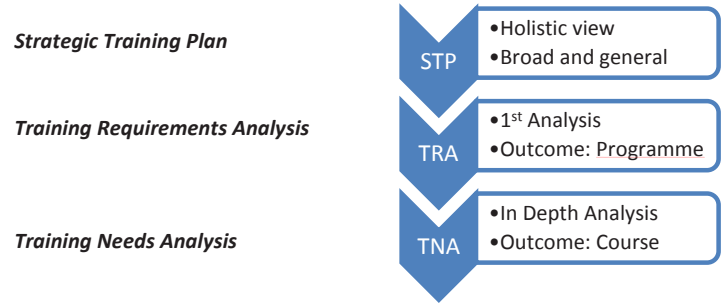
The Joint CBRN Defence COE (JCBRND CoE) has been involved in the entire spectrum of the E&T program since its recognition in 2006 and, thus, it has great experience and a long tradition in E&T. Therefore, the JCBRND CoE welcomed this new approach and analysed ways to support the new concept in the most efficient way. Ultimately, the JCBRND CoE has offered to become the "Department Head" (DH) for CBRN defence working closely for ACT Joint Force Trainer and the Requirement Authority (RA).

By assuming this role ACT sent the request for support to the JCBRND CoE in collecting information about CBRN/WMD in E&T Global Programming activities and organized a Training Requirement Analysis workshop on 8-12 July 2013 in Vyskov (CZE). This very successful workshop orchestrated by ACT JETE/SPP and supported by the JCBRND CoE, NATO HQ IS WMDC, SHAPE, JFC Naples, NMIOTC and NSO Oberammergau analysed individual and collective training needs and prepared the CBRN/WMD Training Audience Analysis combined with existing training opportunities for individual and collective training. When approved, those two documents will serve as a driver to implement training requirements through the dedicated T&E plan.

Although many important steps have been completed it is fair to say that many steps are still waiting in a queue.



New E&T Framework



Assuming the TRA is an approved document the most significant and painful next step seems to be the Training Needs Analysis (TNA) and the decision on future "NATO courses". The subsequent TNA process will define the training audience; specify its core functions and related performance objectives; and clarify the Depth of Knowledge levels required. This will be carried out by the JCBRND CoE when appointed as DH for CBRN defence. Finally, CBRN defence is a complex issue and, therefore, it can only be successful if handled "jointly" involving NATO's partners, the UN family and other IOs and NGOs. The JCBRND CoE wants to play the proactive role and be the "engine" looking into its future role and NATO expectations. With that, the aspiration for the role of DH and the leading role in the area of CBRN training is a great challenge – short in terms of time to complete but long in terms of tasks to accomplish.

Author: COL Vratislav OSVALD (CZE)

Discovering Transformation Through Experimentation

The primary mission of the JCBRN Defence COE is to support NATO's military transformation in the field of CBRN defence. Concept Development and Experimentation (CD&E) is one of the tools by which the COE carries out this task. In particular from 2010 up until now, the COE had a key role in:

- Countering Hybrid Threat Experimentation 2011 led by ACT;
- Four experiments exploring the Reach Back & Fusion (RB&F) Concept:
o the Maritime CBRN Detection, Identification and Control Operational Field Trial, led by ACT ;
o the Tactical Network Testbed Maritime Interdiction Operation (TNT-MIO) Experiments (since 2010) led by the US Naval Postgraduate School;
o The RB&F experiment 2012 led by ACT;
o A JCBRN Defence COE led RB&F Experiment which started in 2011 and ended in June 2013.

These experiments enabled the COE as CBRN key player in finding CBRN related NATO and Multinational shortfall solutions, and identifying Minimum Capability Requirements (MCRs) of future CBRN defence capabilities.
It is important to mention an adaptive capability development trend which is ongoing in our COE because of its commitment to these experiments. In April 2013 this "evolution", ended up in the establishment of a Reach Back Coordination Element (RBCE) within a brand new Operational Support Department (OSD). Additionally, the COE created a dedicated Multinational Experimentation Section under the Transformation Support Department (TSD).

However these results are not an end itself, in fact the COE proposed to develop two new CD&E experiments in the period 2014-18:

- The WMD Disablement Functional Concept and Discovery Experiment;
- Specialist CBRN Defence Sampling Using Forensic Methods to Support Site Exploitation: Validation Experiment.

These issues represent today the key areas of Capability Development in the CBRN domain for the 2020's, the current knowledge borders to prevent, protect and recover against CBRN threats. Effective experimentation will certainly lead to effective, responsive, and resilient capabilities. This is a key mission for our COE

Quotation
"It doesn't matter how beautiful your theory is, it doesn't matter how smart you are. If it doesn't agree with experiment, it's wrong." Richard P. Feynman

Author: LTC Stelian Radulescu (ROU)

Training Exercise and Education Department's Amenable Action on the JFC HQs Requirements

Many recent articles in the JCBRN Defence Centre of Excellence (COE) Newsletters were dedicated to our support to the NATO Response Force (NRF) certification exercises. As a result the reader should have a sound generic idea about overall exercise processes and the COE supportive role in them. Such a type of exercise was always described as a subject of the long preparation and extensive planning process not only for various NATO Staffs but also for the COE personnel backing numerous exercise preparatory steps.

Spring 2013 tested the COE Training Exercise and Education Department (TEED) capability in response to a last minute request for support of JFC HQ Naples One-level MEL/MIL and CAX driven Battle Staff Training (BST) - Naples Vision 2013 (NAVN 13). The goal of this event was to maintain proficiency gained during the NRF 2013 certification process and train NATO forces in planning and conducting crises response operations.
The BST was an eight day event in March 2013 and the TEED supported the MEL/MIL Scripting Workshop and Execution Phase. During the scripting in February 2013 at the JWC Stavanger, the TEED representative was responsible for scripting and injection into the Joint Exercise Management Module (JEMM) with all the CBRN related incidents in close coordination with other functional areas.

During the Execution Phase at the new JFC Naples facility in Lago Patria the TEED representative (as a part of EXCON) coordinated all CBRN related incidents from the position of CBRN SME and participated as a member of the NAVN13 Training Team in order to observe the quality of CBRN C2 activities within JFC HQ Naples during the exercise and operation itself. It is important to mention that NAVN 13 differed from common exercises due to required flexibility within the training audience (TA). All scripted incidents were adaptably tailored during execution phase according to the TA's needs. For the duration of BST only minor shortcomings were reported mainly related to coordination within EXCON caused by dynamic storyline development.
Based on the results of NAVN 13, TEED presence in Stavanger and Lago Patria will bring added value to future NATO exercise support. The COE was able to accomplish two missions at the same time. First, they ensured assistance to the JFC Naples and proved the TEED's flexibility to respond the NATO requirements by maintaining NRF experience and fixing JFC manning gaps. Second, they maintained TEED capability during MEL/MIL scripting and working in the training team. Surely, experience gained by TEED in the both NAVN13 tours will be utilized during the upcoming Steadfast Jazz 2013.

Author: LTC Jaroslav Borek (CZE)

JCBRN Defence CoE supported NATO's Science for Peace Programme with Japan

The Science for Peace and Security Programme (SPS) is a policy tool to enhance international security, peace, and stability by applying the best scientific and technical expertise to deliver solutions for issues of mutual concern to NATO Allies and Partners. It is a NATO programme which offers grants for projects, workshops and training involving scientists and experts from NATO Allies and partner countries. It is not just for the area of CBRN Defence, but CBRN Defence is one of the security challenges of high interest within NATO and Partner Nations.

Since the JCBRND CoE conducted very successful a CBRN First Responder Course with Mediterranean partner countries (Vyskov, June 2013) NATO's WMD Non-Proliferation Centre invited the CoE to another significant SPS event. As result of the NATO Secretary General's visit in April 2013, a 'Kick-off' SPS Info Day was held on 27 June and marked the first step taken by both NATO and Japan toward fulfilling some of the goals laid out in the Joint Political Declaration for strengthening NATO-Japan relations from April 2013. Japan has in the past contributed to building peace in the Balkans and in Afghanistan and to fighting piracy on the high seas. While NATO has no ambition to take on a permanent role in Asia, they see very clearly the advantage of working with like-minded partners like Japan. Japan and NATO spell out their shared strategic interests in promoting global peace, stability and prosperity, through pursuing a rules-based international order that promotes peaceful settlements of disputes.

The Info Day in Tokyo was jointly hosted by the Ministry of Foreign Affairs of Japan and the Emerging Security Challenges Division (ESCD) of NATO Headquarters to which the WMD Non-Proliferation Centre belongs. Approximately 80 subject matter experts and various representatives from the Ministry of Defence, the Ministry of Foreign Affairs, and national embassies attended the event. Prior to the event, Japan had expressed an interest in two main topics: 1. Defence against CBRN agents and 2. Cyber Defence. As a result, the event was divided into an overview on SPS Programmes and two sessions with a separate focus and objective. The first session discussed potential cooperation opportunities available on the topic 'CBRN defence'; the second session discussed possible cooperation related to 'cyber defence'. The sessions included speakers invited from both NATO and Japan.

In his opening speech, the Parliamentary Vice-Minister for Foreign Affairs of Japan, Mr. Minoru Kiuchi, welcomed the new era of cooperation between NATO and Japan as its official global partner. He referred to the intensive relationship with the EU and that Asian and Euro-Atlantic security could no longer be separated because of the interconnectedness of many threats today. The CBRN defence session was moderated by Mr. Matthew Wall from the US Delegation to NATO and opened by LtCol Stephan Jacobsen from the WMD Non-Proliferation Centre who outlined NATO's broader WMD/CBRN policy and current CBRN Defence concepts. Colonel Rainer Schulte from the CoE gave a presentation on the work of the CoE, including cooperation activities with NATO's partner nations. Mr. Masaki Takeda, Head of the CBRN Defence System and Detection Technology Section of the Technical Research & Development Institute (TRDI) as part of the Ministry of Defense highlighted in his presentation some of the research in the area of biological threat detection systems and CBRN hazard prediction software to be used in urban terrain.

The bilateral meeting showed that both NATO and Japan had much to offer each other in terms of defence against CBRN threats today. Knowledge and information sharing seems to be a particularly strong area for potential practical cooperation—especially for the development of a new CBRN reach back capability with a view on CBRN trends and threats in Asia. NATO would like to share the lessons learned and best practices in civil-military cooperation in CBRN consequence management and to understand how cooperation might be developed and what capabilities will have to be put in place, including inter-agency and international cooperation. Japan gained a lot experience from the Fukushima disaster and is therefore an extraordinary partner in sharing best practices for the future on disaster response and disaster preparedness.

The way ahead for future CBRN defence projects will be thoroughly discussed between ESCD, the JCBRND CoE and Japan. NATO's ESCD is targeting a future workshop focusing on an exchange of scientific and operational (military) views on CBRN defence and preventive technologies aimed at comprehensive and timely response to CBRN threats and incidents.

In conclusion, the NATO and JCBRND CoE representatives visit to Japan was a very successful first step to enhancing the information sharing between both partners in the area of CBRN defence. This cooperation will enrich NATO's knowledge on CBRN technology solutions and will provide a platform for experience sharing in the field of CBRN consequence management.

Author: LtCol Stephan Jacobsen (NATO HQ IS WMDC)

JCBRN Defence COE and its First Step to Contribute to The Science for Peace and Security Programme

"The Science for Peace and Security Programme, or SPS, is a policy tool for enhancing cooperation and dialogue with all partners, based on civil science and innovation, to contribute to the Alliance's core goals and to address the priority areas for dialogue and cooperation identified in the new partnership policy."

The SPS Programme funds collaborative activities on topics that are relevant to NATO's strategic objectives. Support is given for multi-year projects, technical workshops and training courses. Recently, NATO decided to support the SPS Programme by offering the services of the JCBRN Defence COE to the partners from the Mediterranean Dialogue (MD).

The JCBRN Defence COE then decided to develop and offer a course related to CBRN First Responders for three nations from MD (Kingdom of Jordan, Egypt, Saudi Arabia). It was approved by NATO and an appropriate budget developed so this course could be organized for the NATO SPS Programme.

The JCBRN Defence COE conducted the CBRN First Responders Course from 17 to 21 June 2013. 17 total participants from the Kingdom of Jordan (7), Egypt (7) and Saudi Arabia (3) took the course at the JCBRN Defence COE to enhance their knowledge in the area of first responder's tasks. It was designed to provide an overview and to highlight difficulties related to first responder's work and training in the international environment. Lecturers from various countries were invited to the JCBRN Defence COE to provide their high quality theoretical lessons. An integral part of most training is the practical exercise. The practical exercise for this course was organized in cooperation with Military Academy at Vyškov, the 31st Brigade of CBRN Protection in Liberec, and the Population Protection Instiutute located in Lázně Bohdaneč. All three participating institutes executed the training professionally and increased the quality of this training significantly.

The course was considered by participants a success and highly valuable for their future activities related to first response. Also, all of them recommended this course to others.

This course was a great challenge for the JCBRN Defence COE. Thanks to the positive attitudes of all the organizers it was sucessfully accomplished and shows the JCBRN Defence COE capabilities in the field of first response as it relates to CBRN incidents. We can proudly state that the JCBRN Defence COE did a great job and proved its ability to contribute to NATO as very qualified partner.

Author: WO Marek Nemec (CZE)

Let's Talk Weapons of Mass Destruction (WMD) – A Popular Science Oriented Essay

ITERATION 1

The aim of this Essay, as the first of a series of WMD related articles, is to provide an overview, historical fact and figures, and some basic understanding when talking WMD. It is also to better understand the idea of the articles which will be published in the upcoming JCBRN Defence COE newsletters.

Why talk about WMD? First, because basic knowledge about WMD is an integral and necessary part of the professional skill set of at least any CBRN staff officer as well as other military and civilian personal working in the CBRN domain. Second, WMD covers and touches a huge variety of neighboring domains which are of interest to all of us. For example, WMD influences national security policies, trade efforts and well-being in general.

For fruitful discussions it is useful to start with the definition of WMD. Unfortunately there is not only one definition, there are several definitions and understandings available. Within NATO, agreed by the NATO member states, the following definition is used:

"A weapon that is capable of a high order of destruction and of being used in such a manner as to destroy people, infrastructure or other resources on a large scale."(AAP 6)

The difficulty with this definition is, that it contains two ambiguous terms. One is "of high order" and the other one is "large scale". Both terms need clarification and specification to use the definition for operational purposes in the political, civil and military areas of responsibility or interest within the NATO Engagement Space. The second definition which needs to be mentioned is from WIKIPEDIA:

"A weapon of mass destruction (WMD) is a weapon that can kill and bring significant harm to a large number of humans and/or cause great damage to man-made structures (e.g. buildings), natural structures (e.g. mountains), or the biosphere in general". (http://en.wikipedia.org/wiki/Weapon_of_mass_destruction)

Again, an ambiguous term is used: "significant harm". This popular science definition might lay the ground for all general discussions beyond the NATO Engagement Space in the public arena and the strategic communications, though. Therefore this definition needs to be taken into consideration as well.

Curiously no official UN definition for WMD can be found. The UN approaches the term WMD via a teleological or canonical methodology. That means that the UN tries to define and understand the term WMD from its history, e.g. the scientific development, its use for military purposes, and its political understandings and implications. The UN SC Resolution 1540 "Non-proliferation of weapons of mass destruction" stands as an example for that.

This complex methodology which allows the development of a hybrid WMD understanding, based on the interactions between scientific developments, its military use and political implications of weapons, can be made clear with the following quote: "Who can think at this present time without a sickening of the heart of the appalling slaughter, the suffering, the manifold misery brought by war to Spain and to China? Who can think without horror of what another widespread war would mean, waged as it would be with all the new weapons of mass destruction?" (Cosmo Gordon LANG, Archbishop of Canterbury, in reference to the aerial bombardment of Guernica, Spain)

Using the current NATO-Definition, the confirmed use of WMD took place in WW I, WWII, and several other conflicts after WWII. Whether the use of "Agent Orange" and "NAPALM" must be judged as a use of WMD needs more analysis and might be tackled in a follow on article.

Especially after the development and use of nuclear bombs the term "weapons adaptable to mass destruction" has been used commonly, first in a western political communique, dated 15 November 1945.

After the fall of the iron curtain, the breakdown of the Soviet Empire and the emerging security issues like network-based terrorism, failed states, or social developments, e.g. the Arabic spring, the risk of a potential use of WMD for NON-MILITARY PURPOSES has significantly increased. These developments were acknowledged by NATO in its 2010 Strategic Concept very well:

"…This includes the proliferation of ballistic missiles, which poses a real and growing threat to the Euro-Atlantic area…

…The proliferation of nuclear weapons and other weapons of mass destruction, and their means of delivery, threatens incalculable consequences for global stability and prosperity. During the next decade, proliferation will be most acute in some of the world's most volatile regions...in particular if terrorists were able to acquire nuclear, chemical, biological or radiological capabilities… develop the capability to defend our populations and territories against ballistic missile attack… further develop NATO's capacity to defend against the threat of chemical, biological, radiological and nuclear weapons of mass destruction…"

In follow-on documents to the Strategic Concept the WMD related risks were also mentioned:

"Weapons of mass destruction (WMD) pose serious risks and challenges to the Alliance and to international security. A primary aim of the Alliance is to prevent the proliferation of these weapons or, should proliferation occur, to reverse it through diplomatic means. The Allies have taken a comprehensive set of practical initiatives to defend their populations, territory and forces against potential WMD threats."(http://www.nato.int/cps/en/SID-8D5F4F7F-2294FACE/natolive/topics_50325.htm?selectedLocale=he)

These basic WMD related threats and risks have been reiterated at the NATO Summit in Chicago 2012.

Two new terms were mentioned here: RISK and THREAT—two more ambiguous terms.

The Occasional Paper 8 – Defining "Weapons of Mass Destruction" – a nearly 100 page scientific document, released by the Center for Study of Weapons of Mass Destruction, offered more than a dozen different US centric definitions from the law enforcement domain up to National Security Strategy domain.

The following quote is from the concluding remarks of that paper:

"The confusion resulting from the adoption of inconsistent definitions creates problems with use of the term. Ideally, those who use the term should rely on the original, canonical definition developed by the UN and now enshrined in international law. It is unlikely that the U.S. Congress or the law enforcement and defence communities will follow such a path. For that reason, it is essential that the specific meaning intended is evident whenever the term is used."

This provides a good line to use when the term WMD needs to be operationalized. Before discussing WMD-Disablement at any stage or for any purpose, the achievement a common understanding about WMD is of utmost importance.

ITERATION 2 will provide ideas on how to engage the two terms "threat" and "risk" for operationalization in the current political situation when "Talking WMD".

Disclaimer:

All thoughts displayed in this article are personal and do not necessarily reflect official JCBRN Defence COE positions or national positions.

Author: COL Rainer SCHULTE (DEU)

A Web-Based Semantic Knowledge Base to Support the Future JCBRN Defence COE-Knowledge Management

Providing the right and – first and foremost – relevant information at the right time is crucial in order to put people in a position to fulfil their tasks in the required and desired quality. To achieve this, all members, the organizational structure, the entirety of the identified operational processes and procedures and the applied IT-technology of the JCBRN Defence COE have to be understood as a whole; more precisely as a system of systems (SoS). This implies the understanding, that adjusting one parameter within this constantly interacting socio-technical COE-SoS will directly influences all other components. Seen from a more technical point of view, all of this leads to the question: Which user-requirements must be met by a future COE-Knowledge Management System in order to support the COE-Knowledge Management?

Please note: To increase the readability of the text, the term "JCBRN Defence COE" will be referred as "COE", the term "COE-Knowledge Management System" and accordingly "COE-Knowledge Base" as "KB".

Initials status – Limitations and Challenges: Looking at the various facets of daily COE-work, it quickly becomes clear that here all characteristics of 'knowledge work' are present: Work which is sometimes very complex and which is not always determinable. Individual work-proceedings are highly people-dependent and require mostly a high level of communication. In addition to this, factors like distributed working environments, high turnover-rates and different individual know-how or needs influences the results. To make things worse, information, findings and working results are usually available in large numbers, different level of abstraction and in an unstructured form. As more IT-related limiting factors non-transparent database structures, a lack of data representation and easy to use data retrieval techniques have to be mentioned.

A Knowledge Base in General: A KB must be designed as a framework providing a means for information to be collected, organized, shared, utilized and searched. The KB is not to be understood as a traditional database, but as a tool, which allows its attributes to be structured and visualized. This has to be done in such a manner also, that allows it to adjust to its user's needs. In summary, a KB has to be more or less comparable to an expert-system with information/facts, sources, evaluations, and structures for problem-solving purposes - for example the "Request for Information"-Management.

Vision and Options: From the perspective of a KB-architect, the KB must support potential users with unknown issues and questions for a particular working-situation with appropriate information. This all together sounds like squaring the circle. But after analyzing the requirements in more detail, the following manageable problem-areas can be identified:

1. Even in small knowledge-domains information is often available in a huge, unstructured or unmanageable manner.
2. Users often don't know what they are exactly looking for.
3. A search will be processed by IT-systems without considering the relevance for the user or without verification of the meaning. This may lead easily to an excessively long list of hits without any information about the completeness or accuracy of the results.
4. Despite steadily improving statistical search-algorithms, full-text queries are still based on just the text strings. That means searches containing ambiguous words, entries in a different language or entries with incorrect spelling will always lead to an incorrect or rather no result.
5. The data-representation is primarily designed for humans as users. People can capture the significance of information regardless of whether it is text, image, video or audio. This information can then be transformed into a different form and/or replaced into relation to other information; machines currently can't do this.

There are strategies available to help solve these problems. A few years ago the idea that information is not only understood by people, but also interpreted and linked together (cross-linked) by machines, was inconceivable. But around the turn of the millennium, the idea of the Semantic Web was born. Today Semantic Technologies, developed in the fields of Natural Language Processing (NLP), Artificial Intelligence or Semantic Search Technologies already offer the possibility of deriving meanings out of information. This can be achieved through the use of Semantic Web Technologies in the form of algorithms, solutions and programs. For example, ontology-languages are one of those possible tools with which a semantic cross-linking of the respective knowledge domain can be implemented. Ontologies (as a blueprint or model of a knowledge-domain) then form the basis for using different visualization techniques, to allow a new form of knowledge-representation and/or knowledge-exploitation.

The future usability of the semantically linked data within the KB depends directly on the efficiency and effectiveness of the applied information visualization. The tool currently used in the KB is able to reduce complex correlations down to their essential characteristics and display them then in a variety of views (Fig 1).

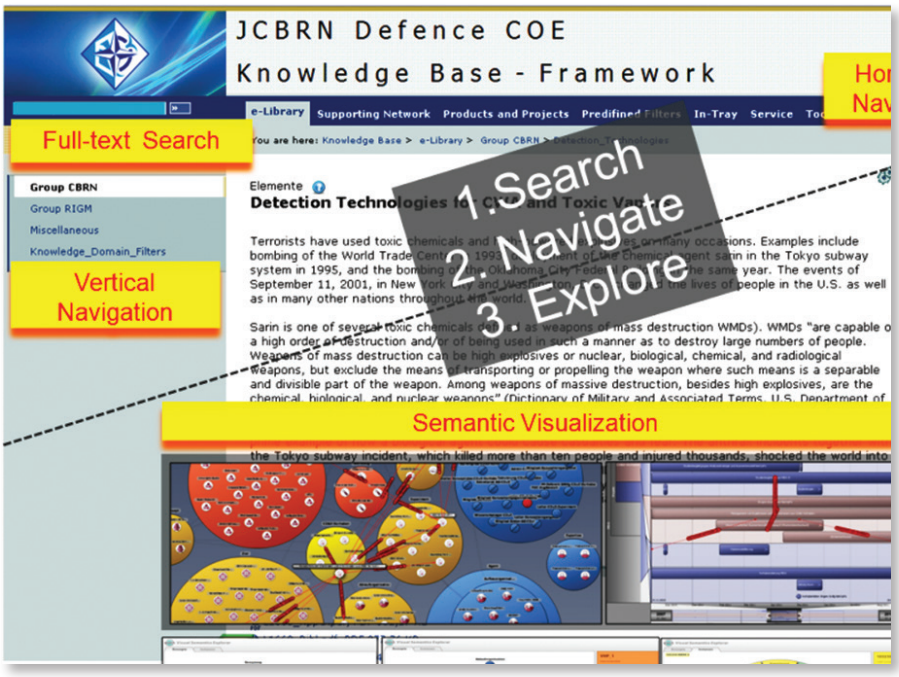


Fig 1: Usage of semantic key-technologies within the COE-Knowledge Base

The compilation of visualizations includes explorative, partial and aspect-oriented approaches. They range from the navigation

in hierarchies to overview of complex structures. The exploratory approach is appropriate to explore partial unknown data, the search for new structures and information, or the identification of new and previously unknown interrelations. The partial approach is mainly used for the visualization of search results or for tasks without the necessity of displaying the complete data-structure. The aspect-oriented approach is targeted to reduce the complexity of the information space. All three approaches are utilized within the KB-Demonstrator in the current state of development, sometimes in combination depending on the individual use-case.

The COE-Knowledge Base in Principle: Basically the requirements-profile of the new KB is specified in the NATO MC 0590 (NATO Chemical, Biological, Radiological and Nuclear Reach Back & Fusion Concept). Based on this, the design of the current KB-approach is derived and additionally optimized according to the latest findings from the recently completed TNT MIO Experiment 2013. Prior to this Experiment a four-step-implementation-plan (Fig 2) to build the future KB was agreed by the COE-Directorate.

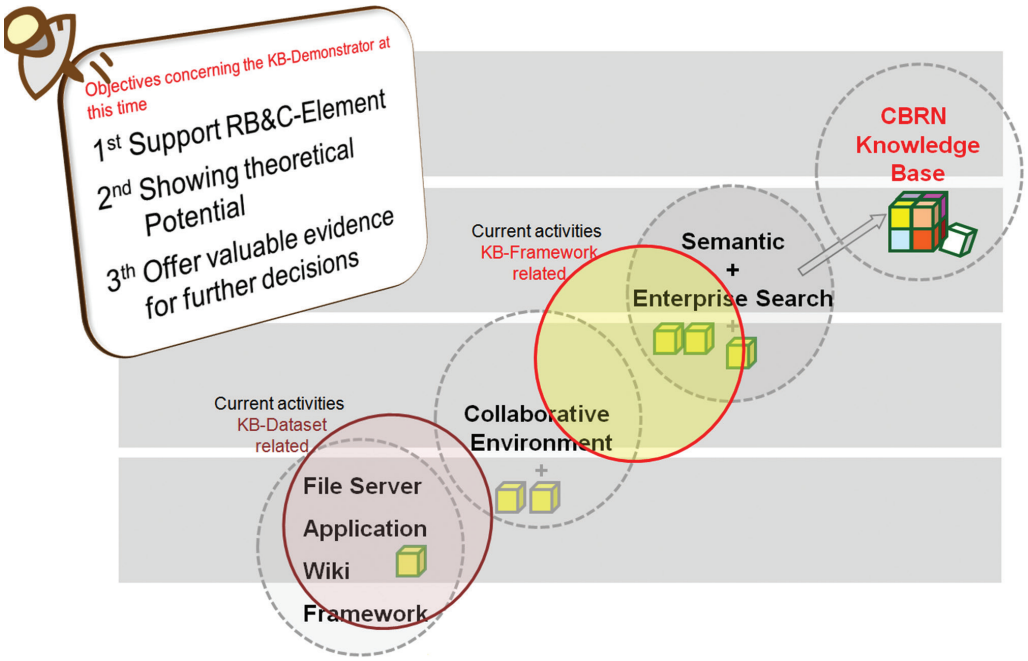


Fig 2: The four-step-implementation-plan of the COE-Knowledge Base

The plan covers the time period from Jan 2013 to Dec 2014. Each of the four steps also has a list of its key activities and decision points. These activities and decision points were also defined and scheduled. In addition to the technical (subject-specific) requirements creating the KB, internal working-rules for the further modus operandi were described. And these rules shouldn't only be seen as a funny buzzword list, but as an appeal to the attitude / philosophy towards one's work:

1. Use one big conceptual picture from the beginning up to the final state of the KB (and therefore change the course of action only in case of absolute necessity).
2. According to this, basic work activities should be carried out only once.
3. Work from simple to complex to ensure a progressive learning curve—a smooth path to success.
4. Keep things transparent to ensure a proper Change Management.
5. Involve people as often and as early as possible to assure a constant staff motivation.
6. Consider the power and effectiveness of people working together through connections and collaboration, taking responsibility individually and collectively (rather than relying on strict traditional hierarchical status).

With regard to content, the KB is subdivided into 6 sections: 1. Library, 2. Supporting Network, 3. COE-Products, Projects and Services, 4. Toolbox, 5. Interaction like semantic queries, generic search, data repositories, Glossaries, etc. and 6. Admin. During experimentation, initial findings on required additional databases were collected and are currently under evaluation.

Conclusion and Way Ahead: Data-representation- and retrieval-techniques have been successfully tested so far. Tests have shown that by using pre-defined semantic search queries, all results fully meet or even outperform all expectations. The upcoming time-period may be seen as a preparation- and test-phase for the operational implementation of the KB within the COE in the first half of 2014. The medium-term KB-goal settings includes 1st the extension of the current semantic model to include aspects from WMD, geology and meteorology and 2nd the integration of (external) SQL databases into the semantic model. The long-term vision is related to topics like the usability of social network-data and the usage of linked data-technologies in the CBRN-knowledge domain.

Author: Staff Cpt D.Trees

I-RAPTER

In accordance with the approved 2013 Program of Work (POW) the JCBRN Defence COE in conjunction with the United States Department of Energy's National Nuclear Security Administration (NNSA) conducted the pilot program for the **"International Radiological Assistance Program Training for Emergency Response (I-RAPTER),** Basic Course from 13-16 May 2013 at the COE in Vyskov, Czech Republic. This three and a half day course was also organized in cooperation with the Czech Republic's NBC Defence Institute of the University of Defence.

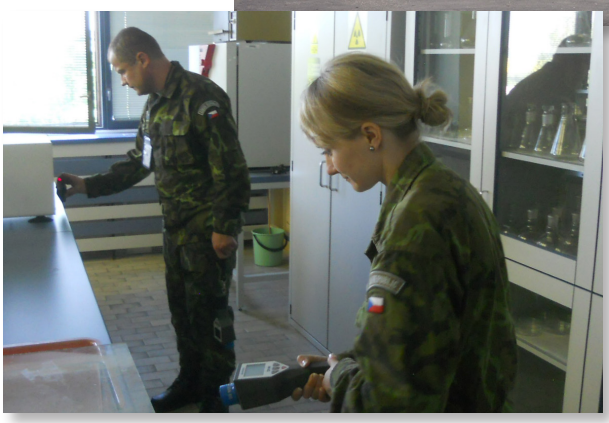
The primary aim of this course was to provide guidance on how to conduct operations where a radiation hazard might be involved. The course consisted of a variety of instructional and theoretical training combined with a robust hands-on portion utilizing a variety of radiation detection devices. After only the minimum number of hours of practical training the students familiarized themselves not only with instruments and devices used for measuring radioactive energy but also with procedures and principles for determining how radiological sources and their emissions occur in man-made and natural environments.
The practical training was divided into two parts. The instructors split the class participants into three monitoring teams. The first monitoring team moved to the Radiological Laboratory of the NBC Defence Institute where students measured differing ranges of radioactive emissions from a variety of known sources. After training on known radioactive sources, students received a task to search and determine types of radioactive emissions present in the vicinity of the laboratories.

In the meantime the second and third monitoring teams conducted radiological reconnaissance within the barracks compound under a DoE instructor's supervision. The students successfully discovered the position of an x-ray device in a local military hospital and during patrol searching they discovered the storage of various radioactive sources as well. For mobile detection the students utilized the **Spectral Advanced Radiological Computer System (SPARCS)** mounted in two vans. The SPARCS is a versatile multi-platform radiation detection system designed to be used for both ground and aerial detection.

All theoretical and practical training was conducted by the eight instructors from the Department of Energy (DoE) of the United States of America, who have countless years of practical experience with radiation protection programs. Many of the instructors have more than 17 years of experience in this specialized field.

Eleven students from three countries (CZE, ITA and ROU) participated in the course. They came from both the military and civilian domains and each had varying degrees of previous experience dealing with radioactive hazards. Based on the student input to the comment forms distributed for the course, all the participants stated that the course has a great value for their future career deployment. The next course is tentatively scheduled during the period 10-15 May 2014. This course offers twenty free slots for students who want to broaden their knowledge and acquire quality experience from real world experts who routinely deal with the detection of radioactive materials on a global scale.

Author: WO Pavel David (CZE)



Training of Military Students Enhanced by JCBRN Defence COE M&S Capabilities

"… Recce team reports detection of hazard material …"

BRAVO1- this is BRAVO21– FLASH – OVER

This message among many others was frequently heard during Computer Assisted Exercise (CAX) "Instinct 2013" which was held at the JCBRN Defence COE M&S Classroom from 29 to 30 May 2013. This CAX was created for University of Defence Brno (CZE) CBRN students. This CAX was the student's last activity before their final state examination.

The preparation for the CAX started at the beginning of January when LTC Petr Neuer (JCBRN Defence COE M&S Section Chief) and Mr. Jozef Kučík (University of Defence Brno teacher) prepared the initial scope of the exercise. The detailed plan with the main topic of the exercise, necessary documents and MEL/MIL scripting were prepared between February and May. Set-up of the M&S network to include hardware and software was also an important part of the preparation phase accomplished by MAJ Lubomír Chylík and WO Kamil Šesták—the JCBRN Defence COE M&S Section subject matter experts. The simulations used for the CAX were Battle Command for tactical events with the Federation of Chemical and Biological Simulation Suite as the simulator of CBRN events.

The topic of this exercise was "CBRN Recce Platoon Commander – Decision Making Process and Command of Platoon during CBRN Reconnaissance in the Battle Situation". The main goal of the CAX was to train students in commander's skills, improve their ability to make right and timely decisions, and to command subordinate CBRN reconnaissance teams with support of M&S capabilites.

The training was divided into two periods:

1.Planning recce routes and creating overlays, creating the order of battle for CBRN reconnaissance, and platoon preparation; and

2.Commanding reconnaissance teams during CBRN reconnaissance, receiving and transmitting CBRN messages using the warning and reporting system, command of subordinate squads via radio communication means, and the preparation of final reports for the CBRN Company commander about results of CBRN reconnaissance.

The simulation started after the first period. Apart from common CBRN issues students had to solve unexpected situations as attacks of enemies, diversionary groups, or the loss of one CBRN recce team. Those situations in accordance with MEL/MIL demonstrated the student's ability to make appropriate decisions.

The exercise showed on the one hand a good education in theory and on the other, a knowledge of a platoon commander's duties even with their minimal experience with leadership. They understandably had low practical skills concerning command of subordinated teams (e.g. the use of radio communication means to command, timely orders to recce teams).

The modern battlefield demands a high level of commander efficiency in all levels of the chain of command. Training with constructive JCBRN Defence COE M&S tools allows students to develop appropriate commander's skills, provides knowledge of practical leadership of subordinate units, and improves their ability to make commander's decisions. The students appreciated M&S tools as a modern form of education and training which can enhance their leadership skills and the leadership skills of young CBRN officers.

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Modeling and Simulation in Support of the MIO Experiment & BIOSAFE 2013

Military simulations, also known informally as war games, are simulations in which theories of warfare can be tested and refined without the need for actual hostilities. Military simulations are seen as a useful way to develop tactical, strategic and doctrinal solutions. Additionally, non-military uses of Modeling and Simulation (M&S) covering a wide range of areas

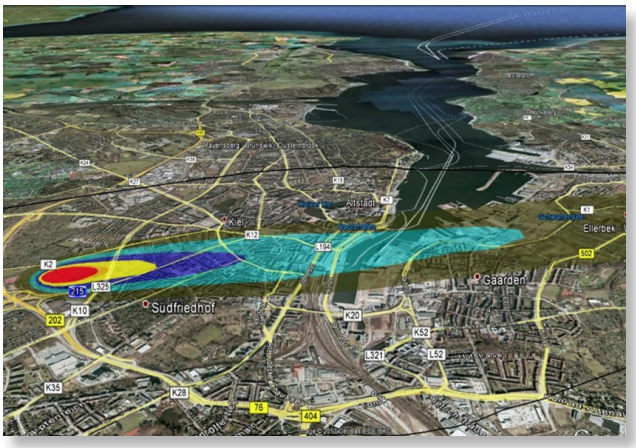

Figure 1, Explosion of small Radiological device in Kiel-populated area

such as homeland security, transportation, environmental impact, communication, energy, intelligence, interagency-coordination, training for emergency response, consequence management planning as well as an infinite number of other possible applications are being developed on a daily basis.

Recently, the JCBRN Defence COE M&S Section supported the Maritime Interdiction Operation (MIO) Experiment 2013 and BIOSAFE 2013 Field Exercise. During both exercises their main objectives were demonstrating their potential role in the JCBRN Defence COE Reach Back Element, developing use cases and appropriate Courses of Action (COAs), and demonstrating the use of various simulations and the capabilities associated with them.

The MIO Experiment 2013's main objective was to explore feasibility and major constraints associated with network-enabled detection and interdiction of maritime-sourced nuclear radiological threat to the U.S. and NATO installations in foreign countries. The main portion of the MIO 2013 was divided between the activities in Poland and San Francisco Bay. The simulation used during this experiment was the Battle Command with CB Sim Suite (BC-CBSS). The two use cases developed are as follows:

Use Case I – Vehicle Intercept. A vehicle with suspected radiological material departed the Port of Kiel and it was involved in an accident in a populated (COA1) and less populated area (COA2). As a result of the wreck, an explosion of small (See Figure 1) and large radiological material were released.

Use Case II – Maritime Vessel Intercept. A small fast boat with suspected shielded radiological/nuclear material approaches the Golden Gate Bridge in San Francisco Bay. The two COA's used were detection inside and detection outside the bay. Patrol teams received a warning message from the sensor buoys and identified the suspected watercraft. Explosions occured

Figure 2, Explosion of Radiological device inside and outside the bay

releasing unknown amounts of radiological material. (See Figure 2)

BIOSAFE 2013 Field Exercise - The Forensic – Sampling – Decontamination Workshop and Field Exercise (FSD WFE) was the primary Transatlantic Collaborative Biological Restoration Demonstration (TaCBRD) event for collecting data to support the assessment of forensic and sampling capabilities and resilience during a biological incident. The goal of the DTRA program is to enhance the US capability for interagency response and coordination in foreign consequence management.

The Use Cases developed during this exercise were:

- Use Case I – Biological Aerosol Release
- Use Case II – Biological Terrorist Lab
- Use Case III – Disease Outbreak in a Refugee Camp

Additionally, the simulations used were Battle Command – CB Sim Suite (BC - CBSS) federation, HPAC, and EDMSIM.

M&S tools and applications were used in the MIO Experiment 2013 and BIOSAFE 2013 to enhance a "common operational

Figure 3, EDMSIM-COP of BIO event

picture" "(COP) (See Figure 3) to assist decision makers in examining complex problems and allow for opportunities to develop solutions. M&S was used to conduct a series of "what-if" questions and analysis utilizing real-world capabilities. M&S can be used to assist in driving a training scenario for the Reach Back Center staff and SMEs at a variety of locations. M&S tools and applications provide a "suite of capabilities" to assist commanders and staff in their decision-making processes. The M&S Section looks forward to providing these capabilities for future exercises, operations, and the Reach Back Element.

Authors: Mr. Jiri Pail
WO Kamil Sestak (CZE)

Lessons Learned And It's Future At The Jcbrn Defence Coe

As you may know, the Lessons Learned capability of JCBRN Defence COE was moved from the Transformation Support Department (TSD) to the Training, Exercises and Education Department (TEED). Lessons Learned capabilities were incorporated into a new section called Lessons Learned and Exercise Support. The reason for this was to fully realize the evaluation abilities of the former Lessons Learned, Evaluation and Analysis Section.

This article will inform you about the future steps for the LLES section. It will use the 5W method: "What? When? Where? Why? How?"

We will begin by reviewing LLEAS' previous activities in support of NATO exercises focusing on NATO Reaction Force (NRF) preparation particularly in the CBRN Defence and Force protection (FP) space (What). We would like to transform all experiences and observations identified into lessons learned through analysis (How). These lessons learned could help avoid common mistakes (Why) both in the preparation process and during the mission. The "When" and "Where" are a little more complicated--all observations are more accurate and effective on the spot at the exercise or operations area. This must be taken into consideration as financial resources become more limited—an experienced lessons learned analyst can record and publicise the lessons learned of an exercise saving time and money for the exercise's next training audience.

There are several definitions regarding the lessons learned process:

•LL process – is an important tool to support commanders at all levels in making the necessary decisions to remedy deficiencies and to record, enhance and communicate best practices; (Bi-SC Directive No. 80-6). Lessons learned are not just focused on the negative experiences.

• Observation: (JALLC) – "Noted phenomenon (event) prior to analysis, diagnosis or interpretation".

- Issue identified for improvement
- Issue identified for communication best findings

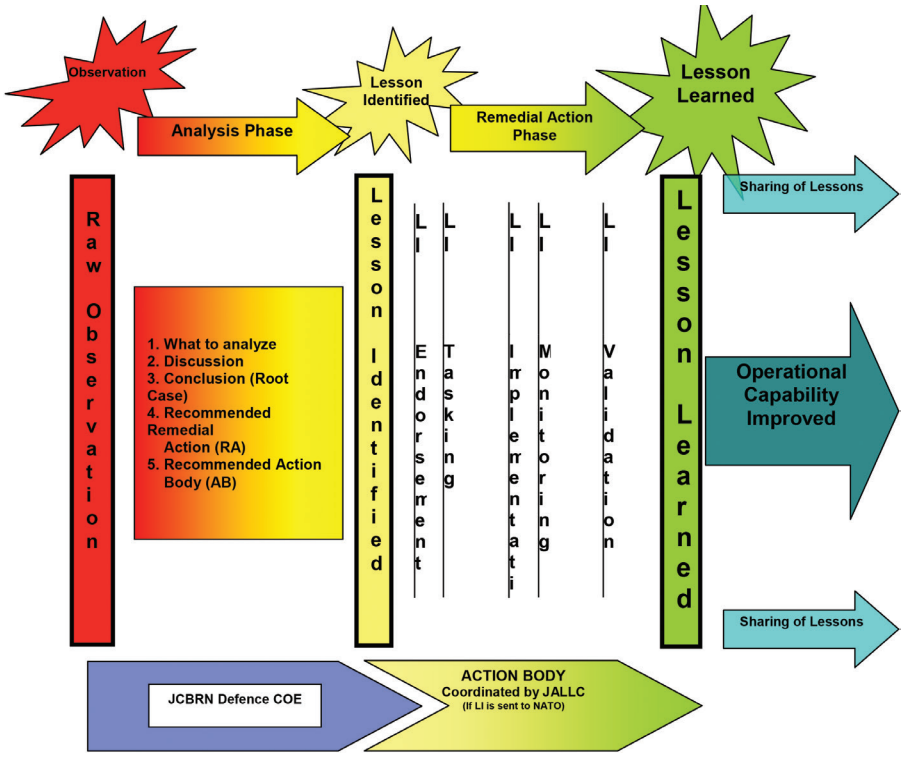

Figure 1:
Model of LL process for our COE in conjunction with NATO LL process guaranteed by Joint Analysis & Lessons Learned Centre (JALLC)

• Lesson Identified: (JALLC) – "An observation for which a remedial action has been developed and an action body to carry out the remedial action proposed

• Lesson Learned: (JALLC) – "A result from the implementation ofa remedial action that produced an improved performance or increased capability."

The LL Process works generally as follows (illustrated in Figure 1):

a) Initiation

- An observation from an event triggers the LL process;
- It is complete when the effects of the actions are recorded;
- Quality of observation deter mines the overall quality of LL.

b) Analysis

- Used to thoroughly understand areas of activity identified to have the potential for improvement;
- Result - possible courses of action are proposed to redress the causes of the observed effects;
- One course of action is selected for final approval.

c) Lessons Identified (LI)

- LIs are the desired outcomes of analyses.

d) Endorsement and Tasking

- An appropriate command approves the LI and takes the necessary (remedial) action or forwards the LI to next higher level / designated Action Body.

e) Implementation, Monitoring and Validation

- The Action Body implements the Action Plan while the tasking authority monitors its accomplishment.

f) Lesson Learned (LL)

- The final step of the process - validation proves that the Remedial Action (RA) on LI works and the problem really was solved.

The overall LL process is also described in the COE's SOP – 2000 issued in February 2011. Please feel free to review it—remember, the lessons learned process is not just a topic for senior leaders, it should be of interest for all of us as we should all strive for improvement. The lessons learned process is here for you! Please contact us for assistance and questions.

Author: LTC Adolf Labak (CZE)

Head of WMD Non-Proliferation Centre Visited JCBRN Defence COE

On 27 August 2013 the JCBRN Defence COE hosted a rare visit of Director of Nuclear Policy Directorate and Head of WMD Non-Proliferation Centre Mr. Fred S. Frederickson. The Ambassador was accompanied by the delegation led by the Director of Defence Policy and Strategy Division of the Ministry of Defence of the Czech Republic Mr. Jan Havranek.

Ambassador was informed by the Director of JCBRN Defence COE COL Jiri Gajdos about all achievements and current activities of the JCBRN Defence COE. The meeting continued with presentation focused on the future and the way ahead for CBRN support to NATO conducted by the JCBRN Defence COE. COL Jiri Gajdos introduced the proposed changes in organizational structure that would allow JCBRN Defence COE to be more proactive to meet the expected challenges. He stressed importance of CBRN Reach Back Coordination Element, Department Head and Quality Assurance ambitions. After the Director briefing visit continued by overview of COE´s Modeling and Simulation Capabilities with small demonstration of possible M&S outputs. After lunch CBRN RBCE and Information Knowledge Management (IKM) update was provided to Ambassador.

Final point of the agenda of visit was discussion about future cooperation between the WMD Non-Proliferation Centre and the JCBRN Defence COE and the resulting draft of the Technical Agreement.

Authors: MAJ Elemir Kurej, Mr.Zdenek Hybl (CZE)

Sign up for CBRN Courses Autumn 2013

1. International Consequence Management Course (1 – 4 OCT)

The aim is to provide assessment specialists, emergency response personnel, and emergency managers with the tools and techniques to develop and execute plans for responding to complex issues related to the release of radiological materials. Established strategies will be presented that cover the response elements required to respond to such events. Additionally, interaction and coordination between those response elements will be explored.
Through discussion and practical hands-on applications, students will gain knowledge and experience with prioritizing response need; monitoring and sampling strategies; and data assessment methodology to assist in determining protection actions. At the conclusion of the course, students will understand the methods and coordination necessary to respond, gather radiological data, and assess the consequences of the release. Responders will have an understanding of how plans and response actions change as a response transitions from emergency to recovery phases and what actions are required to move that transition forward.

2. CBRN Warning and Reporting Specialists Course (14 – 18 OCT)

The aim is to train students in warning, reporting and hazard prediction of the CBRN incidents and strengthen the foundation for integrity, good governance and management within members of the CBRN Warning and Reporting Centre by sharing experiences, challenges, and CBRN Warning and Reporting exercises in order to enhance professionalism.
The attendees will become fully qualified in manual operational procedures in the NATO CBRN Warning and Reporting System.

3. Crisis Management after CBRN Incident Course (11 – 15 NOV)

The aim is to introduce and describe EU and NATO Crisis Management concept, organization, systems and procedures including Cooperation and Partnership initiatives in Crisis Management to EU, NATO and Partner Nation officers and their civilian equivalents.
Through discussion and practical hands-on applications, students will gain knowledge and experience of Crisis Management after CBRN attack in relation to current national and international security concerns. The course is developed for key elements of consequence management structures including the police, fire fighters, health services, hospitals, military, civil defense (if applicable), emergency management authorities, public information, and specialist teams such as counter terrorist units or investigation
For more information or initial registration, visit www.jcbrncoe.cz, where you can also download the Registration Form. Registration must be done 4 weeks before the course starts.

Author: CPT Petr Valenta (CZE)

Sign up for CBRN Courses Autumn 2013

Newsletter

Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence

Newsletter

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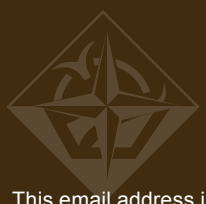

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Partnership for Peace

Newsletter

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