



Newsletter^{1/2012}

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



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Director's Farewell



Dear Reader,

“May you live in interesting times”. So states the ancient Chinese proverb that some even identify as a curse. I suppose I prefer to think of living in interesting times as more of an opportunity to face new challenges and overcome new obstacles. From the collection of articles and the myriad of subjects they address included in this edition of the JCBRN Defence COE newsletter one must conclude that we truly are living in interesting times. Through these volatile times the COE continues to mature as a vital advocate and agent of transformation within NATO. Our ambitions and contributions to the CBRN Community of Interest expand with every passing day.

One thing my six months here taught me is that no single organization obtains greater visibility and awareness of all the things occurring throughout the CBRN Community of Interest than the JCBRN Defence COE. We provide support at every level of NATO. From strategic level participation in critical Work Groups and Conferences to simple requests for support or information from anywhere in the world, the COE always answers the call and delivers singularly outstanding results. Our involvement in the Joint CBRN Capability Development Group and its accompanying Sub-Groups, our ability to provide modeling and simulation support to everyone from the smallest user all the way up to the North Atlantic Council are just a few examples of our versatility and our unique capabilities and our value to NATO and its partners. They also bare testament to the wide range of skill sets developed by our subject matter experts and their individual nations.

We accomplished a great deal over the last half year, but even more challenges await us in the future. As the NATO Command Structure transforms it requires us all to examine ways that the JCBRN Defence COE can better provide support and to develop innovative ways to become more effective agents of change. The future necessitates we take on an increasing role in training and support to operations while at the same time not only maintaining our contributions to transformation but actually increasing them as well. None of these challenges offers simple solutions. They involve the continued dedication of the capable COE staff as well as the stalwart support of all of our Sponsoring Nations. We have shown time and time again that together we can complete any task and overcome every obstacle and I truly believe that in the future the same will be true.

I want everyone to know how proud I am to be the first US officer in the Czech Republic and in the JCBRN Defence COE. I stand in awe of all that you accomplished so far, but know in my heart that our most outstanding achievements are still ahead of us. From conducting meetings ensuring harmonized NATO doctrine and terminology to searching for radiological sources on the high seas the JCBRN Defence COE does it all. We accomplish every mission with a degree of expertise recognized as the “Gold Standard” throughout the Alliance. It’s our solemn mission to continue to do so in the future.

*Colonel Randy Lee Smith
JCBRN Defence COE
Chief of Staff*

Interview with LTC Jiří Chrástek



As I have realized you are one of officers who established the JCBRN Defence COE, aren't you?

Yes, you are right, even though I would prefer to say that I belonged to the team which contributed to the COE establishment. Whilst that time director colonel Mikes drove his attention to international issues I was responsible especially for cooperation with the host nation, thus, I cooperated mainly with the Czech Ministry of Defence and other relevant Czech institutions.

I know that your institution is deeply involved in some maritime activities. It sounds me strange that any institution situated to middle Europe is engaged in such business. Can you familiarize our readers with reasons and history of your engagement?

I agree it can sound strange when any institution located in a landlocked country, contributes to maritime business. But JCBRN Defence COE is an international military organization which is hosted by the Czech Republic. Moreover the first letter in our name means "Joint" therefore we embrace all military forces – the Ground and Air ones, as well as the Navy. This is the reason why we have been involved in maritime business since 2007 when we participated in two limited objective field trials. These trials, which were running under responsibility of ACT, took place in Crete and Norway. This phase resulted in a "Bi-SC Concept for the Joint Prevention of Trafficking Chemical, Radiological and Nuclear Material in the Maritime Environment" published 2010. Later on, in 2011, ACT decided to launch another phase and challenged us to participate again.

Meanwhile we were also contacted by United States Naval Postgraduate School (NPS) in Monterrey, California. They were searching for potential partners for conducting a very similar type of experiment. Therefore we currently cooperate with both organizations ACT and NPS to further investigate how NATO can improve its capabilities in preventing the proliferation of radiological and nuclear materials.

By the way, can you explain to our readers what Maritime Interdiction Operation stands for?

Such operation, which is sometimes called even naval interdiction, is aimed to interfere with enemy forces action. Simply, you want to delay, disrupt or destroy their maneuvers or supplies. In our particular case we explore ways to interdict trafficking of radiological materials by sea.

Thus, your COE cooperates on two different projects which are practically alike. Is it worthwhile to run similar experiments? Could you specify some differences, if there are any?

You are absolutely right when having concerns about duplications but fortunately this is not the case. Whilst NPS is focused rather on use of networks, advanced sensors, and collaborative technology, ACT project is dealing especially with tactics, technics and procedures. In my opinion both projects complements one another and both ones need scientific support therefore we are playing the role of the regional Reach Back and Fusion Center.

You mentioned Reach Back and Fusion which is frequently discussed topic in the CBRN community. Is there any relationship between MIO projects, you are working on, and this activity?

As you said Reach Back and Fusion is the capability which is considered a component of the comprehensive NATO policy for preventing WMD proliferation and defending against CBRN threats. Our COE was tasked to run an experiment focused on this capability development therefore we can take advantage of both MIO projects. When supporting these MIO projects we are getting more experienced in this particular area, we can identify gaps and weak points as well as strong points. All identifications contribute to our Reach Back and Fusion Experiment that can, hopefully, result in the delivery of new capability to the Alliance.

From everything I heard from you I think you are frequently abroad. It is really

nice to spend so much time especially on the seaside, isn't it?

It would be nice to spend more time on the seaside but current technologies enable us to be in touch with our partners also via video-tele-conferences, e-mail or Skype. So if it is possible we are exploiting these possibilities to save not only our time but also money.

And what about your plans for future, are these plans connected with military and the JCBRN Defence COE?

I have been serving in Czech Armed Forces almost for 27 years and during my career I acquired a lot of knowledge not only in area of CBRN Defence but also in another related subjects. Therefore I would like to express my willingness to continue in my work at JCBRN Defence COE in the near future. However that depends on circumstances.

Thus we wish you these circumstances were advantageous not only for you, but even for the whole COE. Thank you for the time you gave us.

LTC Jiří Chrástek

Born: 31 August 1965 Czech Republic
Married, 2 children

1996 – 1997 – CBRN Chief of 6th mechanized brigade, Army of the Czech Republic

1997 – 2003 – Chief of training, CBRN department of Military Academy in Brno, ACR

2004 – 2004 – CBRN department Chief of Military Academy, ACR

2005 – 2006 – Deputy Commander of National NBC Defence Centre in Vyškov

2006 – 2007 – Force Planning and Capability Development Section Chief of the Joint CBRN Defence COE

2007 – Force Planning and Capability Development Section Deputy Chief of the Joint CBRN Defence COE



Author: LTC Martin Pešča

JCBRN Defence COE engaged in TNT MIO Experiment

Participation in the Maritime Interdiction Operation (MIO) activities stands as one of the keystone elements of the JCBRN Defence COE Program in 2012. One of the critical activities involved in this effort is the continued cooperation between the JCBRN Defence COE and the US Naval Postgraduate School. Their Tactical Network Typology (TNT) experiment primarily focuses on network development, and in turn the JCBRN Defence COE provides the complementary CBRN Subject Matter Expertise (SME) and knowledge base critical to the success of the experiment.

The cooperation amongst these two institutions commenced in June 2011 when the JCBRN Defence COE participated in their first Maritime Interdiction (MIO) Limited Objective Experiment conducted by the US Naval Postgraduate School. The JCBRN Defence COE played the important role of a Regional Reach Back Centre responsible for conducting spectroscopic adjudication of an unidentified radiological threat. This experiment involved numerous

other NATO and national co-operating institutions including: US Lawrence Livermore National Laboratory (LLNL); NATO Maritime Interdiction Operational Training Centre (NMIOTC), Souda Bay, Greece; Swedish Defence Research Agency (FOI), Stockholm; Czech Military Technical Institute of Protection (MTIP),



Brno, and the University of Bundeswehr, Munich, Germany (UoB).

This year the JCBRN Defence COE continues our cooperative effort with our participation in this year's iteration of the

TNT MIO Experiment with a number of dynamic interactions. This year's activities already included several video-teleconferences as well as participation in the Final Planning Conference (FPC) held at University of Bundeswehr in Munich from 24 to 26 April 2012. Finally, the main effort focuses on the execution phase of the experiment scheduled from 11 to 15 June 2012, again the JCBRN Defence COE provides a Regional Reach Back Centre. Reach Back will include analysis of spectroscopic data and photographs/video, assessment of ship manifests, available transit information and assessment of other available unclassified information. The Subject Matter Experts (SME) will advise the boarding teams or boat crews on the threat and request additional data or information as required. The numerous technologies developed as a result of this collaboration may pay dividends for any future NATO Reach Back and Fusion capability.

Author: LTC Jiří Chrástek



Maritime Interdiction Operation “Train the Trainers” Course

The JCBRN Defence COE remains committed to supporting Allied Command Transformation's (ACT) Maritime Radiological and Nuclear Detection, Identification and Control Field Trial 2012. As a result we sent a contingency to Crete in order to attend the Maritime Interdiction Operations (MIO) Train the Trainers Course. ACT sponsored the course held from 14 to 16 Feb 2012 at the NATO Maritime Interdiction Operational Training Centre (NMIOTC) in Souda Bay, Greece. All JCBRN Defence COE participants involved in this dynamic training event gained additional knowledge and skillsets that enhance our overall capability to support the entire experiment.

The primary purpose of this Prototype Training entailed previewing the experimental support training requirements for key tactical, operational and strategic watch staff personnel and Reach Back Subject Matter Experts (SME) participating or contributing to the experiment. This event also aimed at gathering constructive feedback from participants and then utilizing that feedback to modify and improve the training as required. The NMIOTC intended to incorporate final modifications into the objective training scheduled to be conducted prior to the beginning of the actual field trial execution.

The training consisted of one day of theoretical lessons and two days of practical training provided on a shipping container stack and aboard a ship. The first day was

focused on course overview, potential threats, legal issues, radiation theory and safety, sensor use, experimental data collection, information flow, as well as on reporting requirements. The second day was dedicated to container stack search procedures and familiarization with some of the equipment used for detection of



day started with practical training on-board an actual ship that allowed operators to employ their detectors in a realistic environment. The final day ended with participants providing detailed feedback and a series of productive discussions on how to improve the training content. These discussions identified several limitations and constraints related to legal issues involved in the ship boarding process, the equipment used for detection, identification and communication as well as numerous other challenges needing to be addressed before and during the conduct of the experiment.

The training proved helpful to the participants, with limited or sometimes even no maritime operational experience, in understanding the conditions that boarding teams will face during the Experiment and in any future Maritime operation.

The 2012 Field Trial Experiment is a long-running event to assess a prototype process for information exchange from a boarding team or boat crew to a 'mother' ship, from the 'mother' ship to a Maritime Operations Centre (MOC) and from a MOC to a Reach Back SME and back to the boarding team or boat crew. This assessment is planned to identify Command and Control (C2) Doctrine, Organisation, Training, Materiel, Leadership Development, Personnel, Facilities and Interoperability (DOTMLPFI) requirements along that entire pathway.

Author: LTC Jiří Chrástek

radiological sources. The trainers utilized the Personal Radiation Detector (PRD) and IdentIFINDER as the primary means of radiological source detection. The third



The JCBRN Defence COE's Role in the NATO Capability Development Process

NATO developed a unique task organization able to shape the transformation while at the same time maintaining its operational capabilities. To facilitate this endeavor NATO differentiated these core competencies at the strategic level. The resultant split created two separate but equally important command organizations. The first, Allied Command Operations (ACO) focuses on operations – or what I would term the “routine”-military business that most of us are familiar with. The second Command, Allied Command Transformation (ACT) develops capabilities to face future scenarios, trends and emerging challenges. Operations are run on standards, procedures and specifically designed organizations. The Capability Development Process on the other hand represents innovation and is based on ideas, creativity, art, discontinuity, evolution and new ways and means of interaction. This makes it much more difficult to standardize.



JCBRN Defence COE was created in 2006 as a flywheel of CBRN competencies able to support NATO transformation efforts led by ACT. The JCBRN Defence COE organized its Transformation Support Department (TSD) tailored to accomplish this function. The COE offers support their functions all NATO bodies through a system of Request For Support (RFS) coordinated through ACT's Transformation Network Branch (TNB). These RFS's are then negotiated with the COE for inclusion into a proposed program of work which must be approved by the JCBRN Defence COE Steering Committee. The JCBRN Defence COE houses the largest pool of CBRN expertise within the NATO Support Structure.

So it's easy to understand why and in what measure the work carried out by COE directly affects NATO Transformation. What is less “intuitive” is how this direct and multiple interaction is realized and managed. In fact this COE is directly involved in the nearly every aspect of CBRN Defence Transformation.

NATO developed the NATO Defence Planning Process (NDPP) as the primary tool for identifying and developing future

capability requirements. All of the other cycles or processes have direct or indirect link to this complex development cycle. All NATO bodies dealing with transformation must use the language, the means, and the resources of this powerful instrument in order to be truly effective. The final deliverables are Capabilities or “capability packages” which can be implemented by NATO or one or more of its member Nations.

In particular the JCBRN Defence COE directly supports ACT in the so called “step2+” of the NDPP. This step identifies the Minimum Capability Requirements (MCR) in the CBRN mission area, the corresponding Capability Shortfalls and determines Capability Solutions in the mid-long term. NDPP is supplemented by a series of parallel cycles such as Lessons Identified/Lessons Learned (LI/LL) Process and the Concept Development and Experimentation (CD&E) Process. The Transformation Support Department within the COE contains sections dedicated to both LI/LL and CD&E. Currently; CD&E represents one of the most critical lines of effort for the COE. In fact recent Steering Committee decisions propelled the experimentation of brand new NATO Capabilities and Concepts to a high priority of the Centre throughout the period 2011-2013 timeframe in support of the two year Reach Back and Fusion (RB&F) Experimentation process. One potential method for conducting this experimentation involves support of an ACT sponsored experiment designed to identify MCR's for the NATO CBRN RB&F Element. A demanding task for a Centre not designed for this kind of effort. This type of effort illustrates the relevant role the Centre plays within NATO.

ACT is not the only leading body to run NATO transformation. In a like manner the Conference of National Armaments Directors (CNAD) operates as the senior NATO committee responsible for promoting the cooperation between countries in the armaments field and the NATO Military Committee serves as the primary source of military advice to NATO's civilian decision-making bodies – the North Atlantic Council and the Nuclear Planning Group. These two strategic level bodies share a subordinated group named Joint CBRN

Defence Capability Development Group. Its mission is to support the development of CBRN Capabilities focusing on Doctrine, Materiel and Training Lines of Development taking into account Long Term Aspects in Minimum Capability Requirements (LTACR) and the Land Armament Management Plan (LAMP). The COE functions as the custodian of a document which identifies the Program of Work of the working Group and its six subordinate panels.

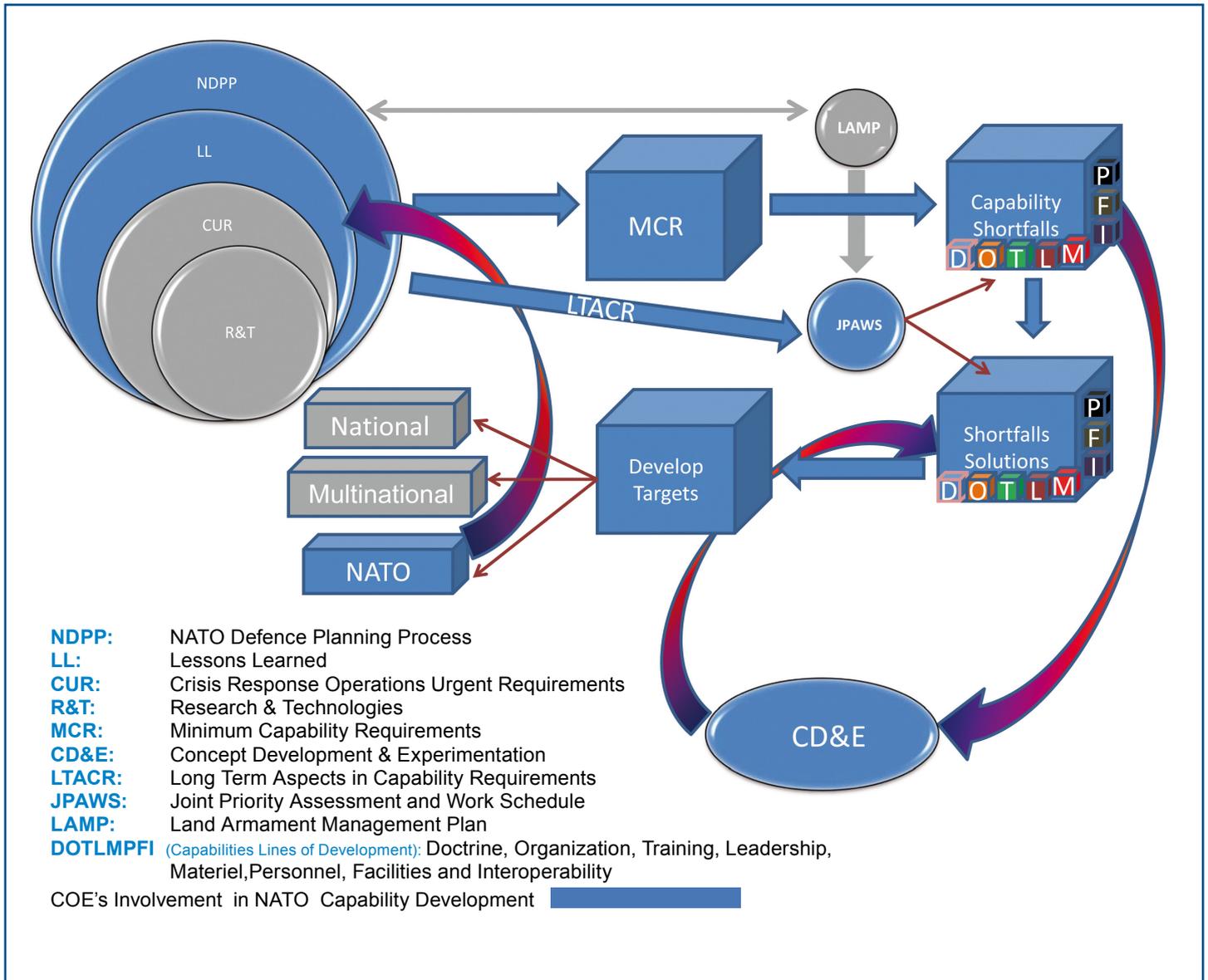
Capability Development represents the future of NATO and its Defence posture. Therefore it is paramount to invest appropriate resources to identify and to predict, “best possible” solutions to overcome future challenges. If innovation is really about creatively re-combining ideas, people and objects from the past in ways which spark the development of new revolutionary capabilities, then in times of increasing economic constraints for the Nations, one of the possible solutions to support and better run transformation within NATO is to rely on inclusive, transparent and professional Organizations, such as the COEs, which could represent the think-tank of tomorrow's NATO specialized capabilities.

¹Since 2011 The JCBRN Defence COE has been dealing with Countering Hybrid Threat Experiment, Maritime Radiological and Nuclear Detection Identification and Control Experiment 2012 (both led by ACT), TNT Maritime Interdiction Operations Experiments (these ones led by US Naval Postgraduate School). In all these experimentations the COE plays the role of SME expertise and/or Experimental Unit. The COE also participates in the CD&E working Group meetings.

²The document is a living document and it is titled Joint Assessment Priority Assessment and Work Schedule – JPAWS.

Author: LTC Romeo Tomassetti

NATO Capability Development



JCBRN Defence COE's Courses 2012

CBRN Warning and Reporting Specialists Course / Pilot Course 15 - 19 October 2012

The aim is to train students to be qualified 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.

First Responders' Trainers Course 4 - 8 Jun 2012

The aim is to prepare and execute "CBRN First Responders' Trainers Course" in order to enhance the quality and shorten timelines of the response to CBRN incidents and the interoperability of first responders

CBRN Unit Evaluator's Course 17 – 21 September 2012

The aim is to prepare evaluators responsible for evaluation of CBRN Defence units to achieve common standard on field of CBRN certification.

Transforming NATO CBRN Defence



Introduction

NATO's Strategic Concept states that: "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"¹

With the strategic concept NATO Allies committed themselves to "...ensure that NATO has the full range of capabilities necessary to deter and defend against any threat to the safety and security of our populations. Therefore, we will further develop NATO's capacity to defend against the threat of chemical, biological, radiological and nuclear weapons of mass destruction"².

In the summit declaration issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Lisbon, Allies emphasised that: "We will continue to implement NATO's Comprehensive Strategic-Level Policy for Preventing the Proliferation of Weapons of Mass Destruction (WMD) and Defending Against Chemical, Biological, Radiological and Nuclear (CBRN) Threats". Further the North Atlantic Council (NAC) was tasked to assess and report, before the meeting of Defence Ministers in June 2011, on how NATO can better counter the proliferation of Weapons of Mass Destruction and their means of delivery.

With the adoption of the NATO's Comprehensive Strategic-Level Policy for Preventing the Proliferation of WMD and Defending Against CBRN Threats by Heads of State and Government at the NATO Strasbourg - Kehl Summit 2009, NATO's thinking about CBRN Defence has fundamentally changed. One cannot read the policy without being profoundly struck by this fact.

The policy tasked the NATO Military Authorities (NMAs) to "be prepared to defend our territory, its citizens and their armed forces against both State and Non-State actors. The approach must account for every stage of an adversary's potential

acquisition and development as well as their intention and preparation to employ WMD.

HQ SACT – Roles and Responsibilities

As one of NATO's Military Authorities (NMA), NATO's Allied Command Transformation (ACT) serves as the leading agent for change, driving, facilitating, and advocating continuous improvement of Alliance capabilities to maintain and enhance the military relevance and effectiveness of the Coalition.

ACT's three primary roles within the NATO **Command Structure are:**

- *supporting operations*
- *leading NATO's military transformation;*
- *engagement and cooperation with others to enhance interoperability, effectiveness and efficiency*

Don't think of these roles as separate or stand-alone. They are not. What happens in one informs all, so that all areas are effectively mutually supportive.

Identifying the capabilities necessary for successful operations in the future is a function derived from ACT's responsibilities under NATO's defence planning process. In essence, ACT works with the nations, ACO, and staff members in NATO HQ, including force planners and the armaments community, to determine NATO's future capability requirements and identify priority shortfalls. ACT then works with nations individually, as well as the international staffs in NATO HQ, to identify the capability contribution each will commit to deliver. As NATO's primary concept developer, ACT is constantly looking for new ways to operate.

The new NATO Comprehensive CBRN Defence Concept

With the endorsement by Heads of States and Government of NATO's Comprehensive WMD/CBRN Policy at the 2009 Strasbourg-Kehl-Summit, NATO adopted a new 3 pillar comprehensive approach to CBRN defence. The new policy states that NATO will work actively to:

- *prevent the proliferation of WMD by state and non-state actors*
- *protect the Alliance from WMD threats should prevention fail*
- *be prepared for recovery efforts should the Alliance suffer a WMD attack or a CBRN incident*

Essentially this requires a full spectrum

of measures and capabilities to prevent the spread of WMD and defend against CBRN threats. These range from non-traditional activities such as NATO support to reinforcing arms control regimes, promoting nuclear and conventional disarmament and supporting multilateral non-proliferation agreements, to more traditional military undertakings such as ensuring NATO provides appropriate military capabilities to conduct missions and tasks designed to prevent the proliferation of WMD and defending against CBRN threats. With regards to proliferation it needs to be emphasized that the principal goal of the Alliance and its member states remains to prevent proliferation from occurring or, should it occur, to reverse it through diplomatic means.

To reflect this full spectrum approach the policy aims to reflect upon existing guidance for Alliance CBRN Defence³ and identify new concepts and policies that should be introduced. Furthermore, it intends to provide a roadmap for the transformation of the Alliance's CBRN defence posture, aimed at the prevention of WMD proliferation and improving coordination and integration of military and civilian protection and recovery from CBRN threats. This must all be accomplished within the competencies of the Alliance.

In line with the policy recommendation that NMAs, "... review and revise, as appropriate, the relevant strategic-level guidance, analyses, defence and force planning documents, as well as develop required concepts for preventing, protecting against and recovering from WMD attacks or CBRN events"^{4,5}, ACT, as NATO's agent for change, began development of a new NATO Comprehensive CBRN Defence Concept in 2010⁶.

The new NATO Comprehensive CBRN Defence Concept addresses the requirements for a full spectrum capability to prevent the spread of WMD and defend against CBRN threats. Additionally it addresses military support to the prevention of WMD proliferation and improving coordination and integration of military and civilian protection and recovery efforts involving CBRN threats. The concept establishes the link between strategic-level policy and capability development. From a hierarchical perspective the concept is a capstone document implementing the NATO Comprehensive Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats as well as the MC Guidance for Military Operations in a CBRN Environment including the

Potential Military Contribution to NATO's Response to the Proliferation of Weapons of Mass Destruction (MC 511).

The aim of this concept is to:

- provide the conceptual framework for a credible and coherent CBRN Defence capability development out to the year 2020
- draw upon the collective competencies of all NATO Bodies through a comprehensive political, military and civilian approach
- inform NATO and national authorities at all levels (political, military and civilian) of the potential implications within their own planning domains, including civil-military interoperability aspects

The concept once approved requires a great deal of follow-on work. The revision of existing and development of new operating and functional concepts, the publication of new doctrinal terms and publications, a thorough review and adaptation of current CBRN task lists, capability and training requirements, as well as potential investment in new technologies and equipment represent just some of the additional efforts the Alliance must commence in the future.

The underlying notion addressed by the concept in its current form is that the 3 pillars covered by the NATO Comprehensive CBRN Policy cover the pre-, during- and post- periods of a CBRN Incident as defined and agreed in the AJP 3.8. This process oriented approach creates the so called CBRN Incident Chain. The purpose of CBRN Defence shifts from focusing on the latter two links (during and post incident) in the incident chain to concentrating on all three and attempting to break the CBRN Incident Chain as early as possible. NATO accomplishes this through planning, preparing and executing appropriate CBRN Countermeasures such as information collection, contributing to intelligence development, establishing situational awareness, conducting sensitive site exploitation and CBRN render safe operations.

When approved the concept stresses new and innovative solutions to CBRN defence. Any future solutions must change the emphasis from the notion that CBRN Defence is merely an enabler for force protection and produce innovative methods that NATO's military capabilities support preventive measures for countering CBRN threats.

ACT CBRN Defence Programme of work

ACT CBRN defence programme of work is focused on implementation of the policy, specifically on the tasks resulting from the report on "How NATO can better counter

the proliferation of Weapons of Mass Destruction and their means of delivery", which was noted by NATO Defence Ministers at their meeting on 08 June 2011.⁷

The report provided by the Committee on Proliferation in Defence format reviews current CBRN defence requirements and policy guidance and identifies areas of progress as well as gaps. It recognises that the NATO Defence Planning Process is an important mechanism by which NATO identifies capability gaps and ensures that the Alliance can respond effectively to future threats. Moreover, realistic and challenging exercise play involving CBRN is essential for enhancing coordination, identifying weaknesses and ensuring effective response to CBRN crisis. Finally operational capabilities to deter, detect, disrupt and prevent WMD proliferation and respond to CBRN crisis can impede proliferation and better posture the Alliance for effective response.

Let me in the following highlight a few issues ACT is currently working on. ACT has and continues to contribute significantly to the above mentioned areas. Predominately ACT has developed a new NATO Comprehensive CBRN Defence Concept.

Over the past 4 years ACT has worked to provide NATO with a practical capability to detect, identify and control the trafficking of illicit radiological and nuclear materials by sea. To date, ACT has conducted a technical demonstration and 2 Limited Operational Experiments (LOEs), drafted Tactics, Techniques and Procedures (TTP) and developed a concept which includes a capability development 'road map'. The technical demonstration showed that it was possible to detect and potentially identify containerised and/or shielded radiological materials from safe distances. However, this was not technically possible for biological or chemical agents. ACT therefore decided early in the experiment to move forward with radiological detection immediately, and then adapt it if/when the technology becomes available to detect containerised/sealed biological and chemical agents. The two Limited Objective Experiments showed that boarding teams could detect the presence of radiological materials without significantly changing their existing TTP's. However, identification required expert intervention that would most likely never be on board of an individual ship. In 2012 ACT is planning to conduct an extended field trial experiment to define the command and control and subject-matter-reach back requirements needed to facilitate NATO counter-trafficking efforts in support of the Alliance's stated desire to support international efforts to curtail the proliferation of WMD and their means of delivery. Together with ACO,

ACT has supported the development of the NATO CBRN Reach Back and Fusion Concept⁸ and is currently contributing, with support by the Joint CBRN Defence Centre of Excellence, significantly to the implementation of a NATO CBRN Reach Back and Fusion with a 2 year experiment starting in 2012.

As a first step to the establishment of a NATO CBRN Reach Back and Fusion capability ACT has already conducted a CBRN related Intelligence Trainings Needs Analysis (TNA). The TNA will lead to the establishment of a WMD Indicators and Warnings Course for Intelligence analysts at the NATO School.

As overall responsible NATO body for Centre of Excellence (COE) coordination and employment within NATO⁹, ACT coordinates the requests for support for the Joint CBRN Defence COE. For 2012 overall 52 requests are listed in the programme of work. Primary customers are currently ACO and ACT. Main focus of the requests are in support of training and operations, support to concept development and experimentation and providing subject matter expertise.

Conclusion

The Article has hopefully given the reader the impression that ACT is taking on its role in the area of CBRN Defence as NATO's leading agent for change and the importance of the J CBRN Defence COE in this process.

¹NATO Strategic Concept, Para 9.

²NATO Strategic Concept, Para 19.

³MC 0511 (Final) with Change 1 (NC) – MC Guidance for Military Operations in a CBRN Environment, including the Potential Military Contribution to NATO's Response to the Proliferation of WMD

⁴Note the AJP 3.8 uses the terminology CBRN incidents as agreed by NATO Allies ratifying the AJP 3.8.

⁵NATO's Comprehensive Strategic-Level Policy for Preventing the Proliferation of Weapons of Mass Destruction (WMD) and Defending Against Chemical, Biological, Radiological and Nuclear (CBRN) Threats, para 37.c.

⁶MCM<-0075-1988, Multi-Service Operational Concept for NBC Defence of NATO forces, 3 Nov 88.

⁷C-M(2011)0041

⁸MC 0590

⁹MCM-236-03

*Author: LTC Frank Kämper
HQ SACT Staff Officer Plans and Policy
WMD/CBRN*

CBRN Modeling & Simulation (M&S) Today (part 1)

Modeling & Simulation Fundamentals

The importance of M&S and its impact on training, experimentation and analysis in NATO and nations is well-known and continues to grow. M&S is an effective tool for analysis, training and acquisition.

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. Optimal utilization of M&S technologies is inevitable for the armed forces of modern world to overcome the new kinds of threats based on unconventional warfare. Military simulations are seen as a useful way to develop tactical, strategic and doctrinal solutions. Even the process of embedding simulation capabilities within weapons systems started to emerge in order to better support the forces on the battlefield. Additionally, non-military uses of M&S covering a wide range of areas 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. The use of M&S in civilian areas aids decision makers in examining complex problems and allows for opportunities to develop solutions with limited resource expenditures compared to utilizing real-world capabilities.

Common M&S Terms

Model - "A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process." (DoD M&S Glossary, Jan 98)

A physical model is a model whose physical characteristics resemble the physical characteristics of the system being modeled.

A mathematical model is a symbolic model whose properties are expressed in mathematical symbols and relationships.

A process model represents the procedural steps of a task, event or activity performed by a system.

Simulation - A method for implementing a model over time

Types of Simulations:

- *Live Simulation* - A simulation involving real people operating real systems.
- *Virtual Simulation* - A simulation involving

real people operating simulated systems.

• *Constructive Simulation* - Simulations that involve simulated people operating simulated systems.

Advantage and disadvantage with M&S

Using M&S assists commanders in making better tactical, operational and strategic decisions. M&S allows them to modify important variables like weather, terrain, and enemy capabilities in a way the physical world cannot duplicate and over a much shorter period of time. This allows commanders at all levels to better assess the impact of a changing operational environment on a plan. This single attribute of M&S provides one of the single greatest advances in modern warfare and offers rapid feedback on many operational and structural issues. It also provides a methodology for focusing on very specific aspects of a plan and allows for multiple variations of a complex problem to be played out in a virtual world. In essence it allows commanders to learn many of the painful lessons of war, without the inherent risk of combat. This fact alone created a revolution in how we prepare for the uncertainties of the future.

M&S should not be used, if the costs exceed the value gained. If resources, time, data or estimates are not available or when the problem can be solved analytically using manual methods or common sense. Limitation for effective use of M&S capabilities include: lengthy preparation time for complex problems or new simulations, inadequately trained staffs in the use of M&S, the need for full-time, long-term contractor support and the requirement to link different simulations in order to develop the desired effect. All of these issues present obstacles to the M&S community and most solutions demand the capabilities of a high demand low density work force.

JCBRN Defence COE M&S contribution to NATO

Since end 2003, the NATO Research & Technology Organization (RTO) Modeling and Simulation Group (NMSG) identified interoperability problems in modeling & simulation between different nations and different services participating in emergency response exercises such as earthquakes, floods, forest fires, chemical accidents, nuclear accidents and the transport of dangerous goods. Additionally M&S supports Critical Infrastructure Protection simulations which are one of

the highest priorities in the context of Defence against Terrorism (DAT). M&S also supports interoperability aspects and analyzed them for the future CBRN federation development and an initial federation (see p. #4) prototype was specified and tested during the Bulgaria exercise PHOENIX 2010.

The overarching aim of MSG-096 - Consequence/Incident Management for Coalition Tactical Operations as one of the NMSG is to further develop the interoperability of such systems within NATO and to demonstrate the added value of such a federation to NATO coalition training and preparedness for Consequence Management, specifically that of Chemical, Biological, and Radiological incidents.

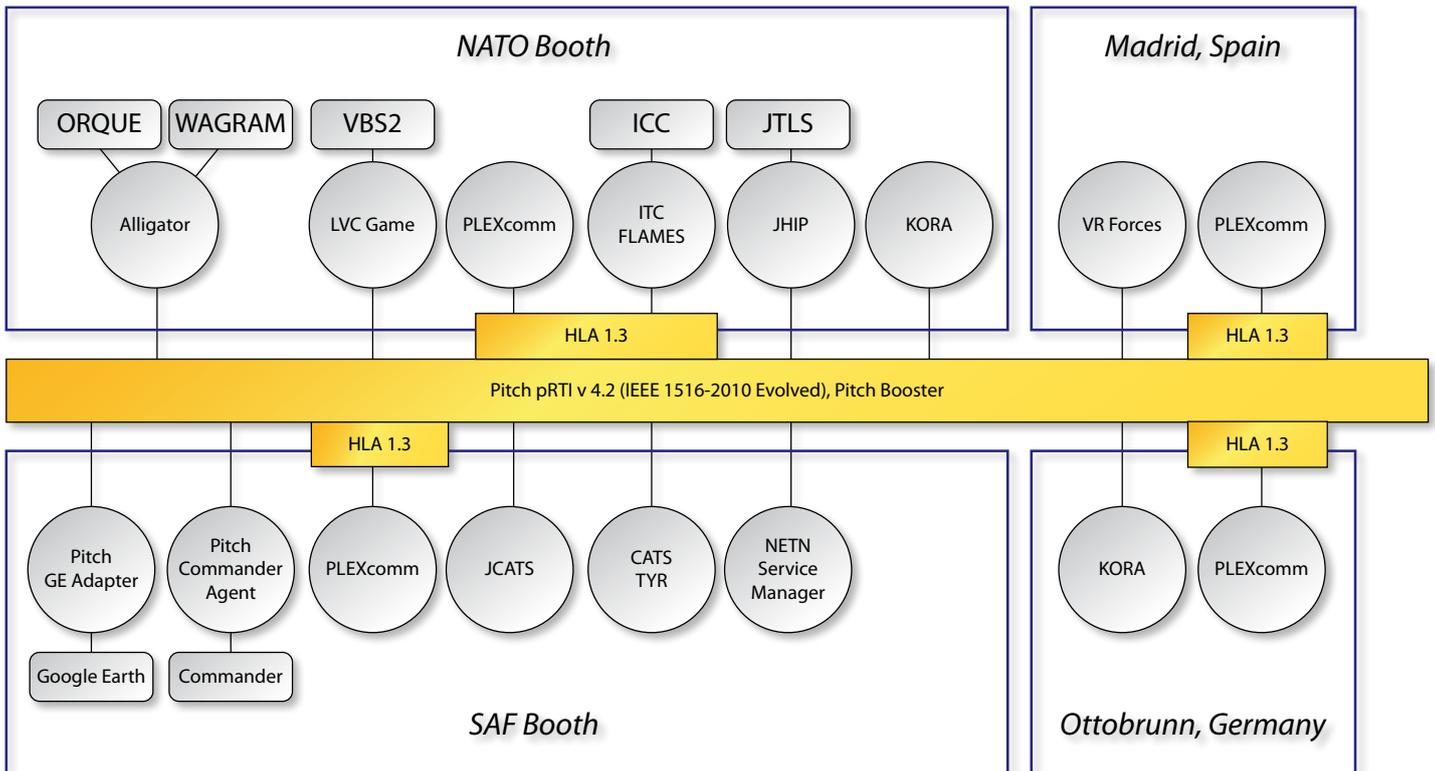
The MSG-096 2013 POW proposed a demonstration of the following features:

- *CBRN simulation system federation architecture*
 - *Ability to exchange data through common NATO standards, between the CBRN simulation federation and generic CAX (Computer Assisted Exercise) simulation systems*
 - *Ability to support CBRN scenarios relevant to NATO operations i.e. maritime interdiction operations, large urban fire, missile interception, high visibility events, pandemic disease, and asymmetric events*
- MSG-096 2013 POW expected products and/or deliverables include:
- *Development of CBRN interoperability standards including a CBRN High Level Architecture (HLA) Federate Object Module (FOM) and a set of Web Service Schemas for Simulation to C2 interoperability.*
 - *Experimentation of standalone prototype CBRN federation system.*
 - *Experimentation of prototype CBRN federation system interoperating with generic CAX simulation systems during a NATO Live, Virtual and Constructive (LVC) training exercises.*
 - *Technical report.*

The JCBRN Defence COE M&S serves as a valuable member of MSG-096 and has done so since 2008. We remain committed to providing CBRN Subject Matter Expertise in order to ensure that the CBRN functional area is well represented in any future NATO M&S effort.

Author: Mr. Jiří Pail

Example:



Federates

All federates participating in a NETN (NATO Education and Training Network) federation must be clearly identified and described. Agreements with respect to federates include:

- Federate Name, Federate Type, Federate Application Name and Id (name of the application hosting the federate, note that the same application can host several federates, e.g. a bridge application)
- Application ID – The application Id is used when exchanging information to create unique identifiers assigned to entities.

• Interface used to connect to the RTI (Run-Time Infrastructure) (e.g. HLA 1.3, IEEE 1516-2010 ...)

- Federation Name (the name of the federation which the federate joins)
- Description (Information about the main role in the exercise and any additional important information)

For clarity, a figure describing all federates connected in a federation (so-called lollipop picture) should be included in the federation agreements.

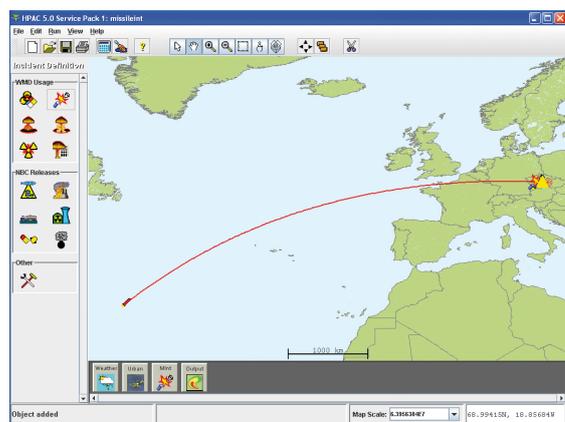
In a federation the responsibility of modeling and simulation of the synthetic environment is distributed. Each federate have intrinsic capabilities to represent certain aspects of entities, events and

other phenomenon in the simulated environment. During federation design the roles and responsibilities of all federates are described and documented. The responsibility of modeling certain aspects can only be assigned to a federate with a capability that meets specified requirements. Initial modeling responsibilities and capabilities of dynamically transferring modeling responsibilities shall be documented in the federation agreements.



JCBRN Defence COE Participation in the Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX)

The Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) is an annual NATO Military Committee approved event designed to bring about continuous improvement in interoperability for the Alliance. Allied Command Transformation (ACT) provides direction and management



to the programme, while NATO and Partner nations sponsor interoperability capability demonstrations engineered to fulfill specific objectives defined by ACT and National Leads.

For the first time in its short but illustrious history, the JCBRN Defence COE intends to participate During CWIX 2012 in support of the NATO Ballistic Missiles Defence (BMD) POW. The Final Coordination Conference (FCC) outcomes stressed, in accordance with the Lisbon Summit, that Missile Defence occupy a robust presence in the upcoming CWIX endeavor. Multiple missile defence related commands expressed a strong desire to participate in testing. The JCBRN Defence COE provides a critical level of support to the NATO Command structure, including NATO HQ (SITCEN), SHAPE and AIRCOM in this vital new capability by offering a key component for future BMD competencies and civil response planning. The JCBRN Defence COE's ability to identify potential CBRN effects for both Consequence of Engagement (COE) and Consequence of Intercept (COI) delivers a valuable tool to NATO and civilian planners. To accomplish these vital missions the JCBRN Defence COE employs two modeling and simulation tools - Hazard Prediction Assessment Capability (HPAC) and CBRN-Analysis.

During a NATO BMD crisis, the JCBRN Defence COE could provide CBRN hazard modeling and simulation capability from its location in Vyskov, Czech Republic or could deploy with a portable version of the BMD Consequence Mitigation toolset to support NATO decision makers and operators in their headquarters.

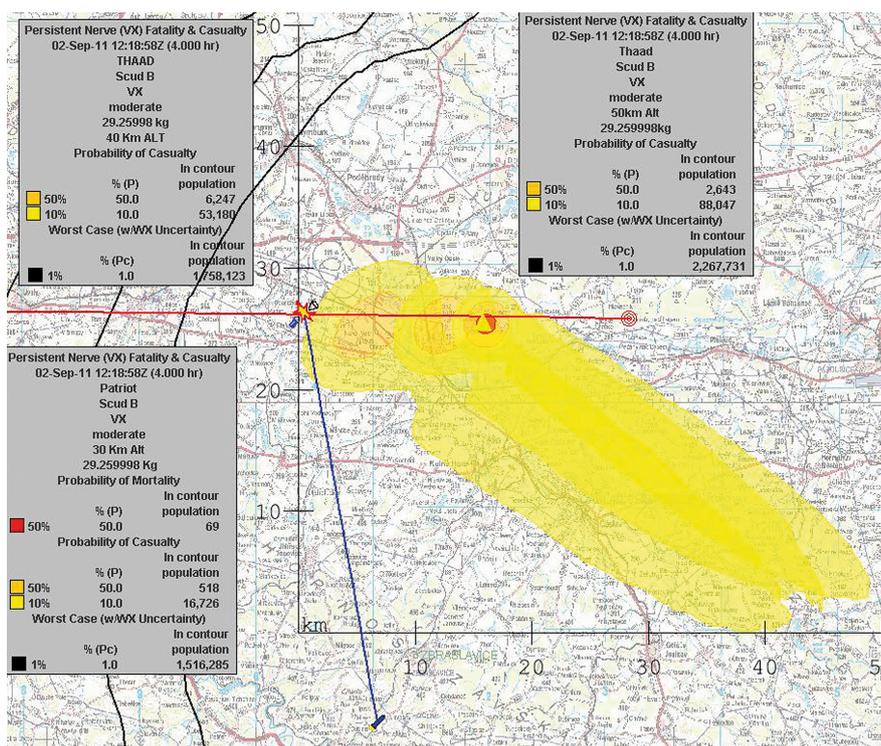
The JCBRN Defence COE will investigate interoperability issues and work to develop future capabilities using NATO CWIX architecture. Potential Capabilities include extracting Enemy Order of Battle (EOB) and Enemy Courses of Action (EOA) from NATO Intell Toolbox in order to assist the development of CBRN hazard predictions before and after BMD attack. JCBRN Defence COE utilizes HPAC and CBRN Analysis tools to provide predictions to be used for both Military Operational and Civil Emergency Planning. CBRN hazard plots are shared

with both military and civil Command and Control (C2) elements. The capability will include the ability to obtain Intelligence on EOB and ECOA, obtain weather data and create 2-D consequence prediction plots to military and civilian authorities in a timely manner.

During FCC JCBRN Defence COE Focus Areas were also discussed with the HQ SACT, Command, Control, Communications and Computers, Intelligence Surveillance and Reconnaissance (C4ISR) and NATO Network Enabled Capability (NNEC), the Head Interoperability Assessment & Reference Facility Section and the r CWIX Director. The CWIX Director reiterated in his closing remarks that as outlined in the Lisbon Summit, Missile Defence will continue to be an important part of the CWIX community. He expressed great interest in the JCBRN Defence COE active participation and its CBRN related tasks during CWIX 2012. He will convey JCBRN Defence COE contributions to this exercise to the NATO Military Committee

NATO CWIX 2012 execution will be held in JFTC in Bydgoszcz, Poland, from 04 -21 Jun and JCBRN Defence COE will be a critical participant in the BMD portion of the experiment.

Author: LTC Zdeněk Vrabel



How to Integrate Partnership for Peace Nations into a COE's Program of Work.

At the beginning of this article I would like to mention several things that will help us understand the full content of the commentary. Although these items are very well known within the tiny confines of the 16 Centres of Excellence (COE), and many of those readers would consider mentioning these facts as redundant, I think reiterating them for those unfamiliar with how COE's are formed and their administrative, functional and operational procedures offers a unique opportunity to expand our audience and repeating them will not cause any harm. A COE is a nationally or multi-nationally sponsored entity. This entity offers recognised expertise and experience to the benefit of NATO and at the same time is not part of NATO Command Structure (NCS) but rather forms part of a framework supporting the NATO Command Arrangement (NCA).

Once we identify what a COE is, it is next important to return back to the main topic of this article which is the process, or more appropriately, the possibility of a new partner joining a particular COE. The basic principal ruling the COE joining process is that involvement in COE activities is open to all Allies. Nations which agree to establish and operate a particular COE correspondingly sign two Memoranda of Understanding (MOU). These are the Operational and Functional Relationship MOU. Once a nation agrees to join a COE they become what are known as a Sponsoring Nation (SN) of the designated COE. We can further

define the term Sponsoring Nations as Nations that are collectively proposing the COE to the Alliance and have consented to be represented in the COE providing personnel, equipment, funding and other support or resources to the operation of that particular COE.

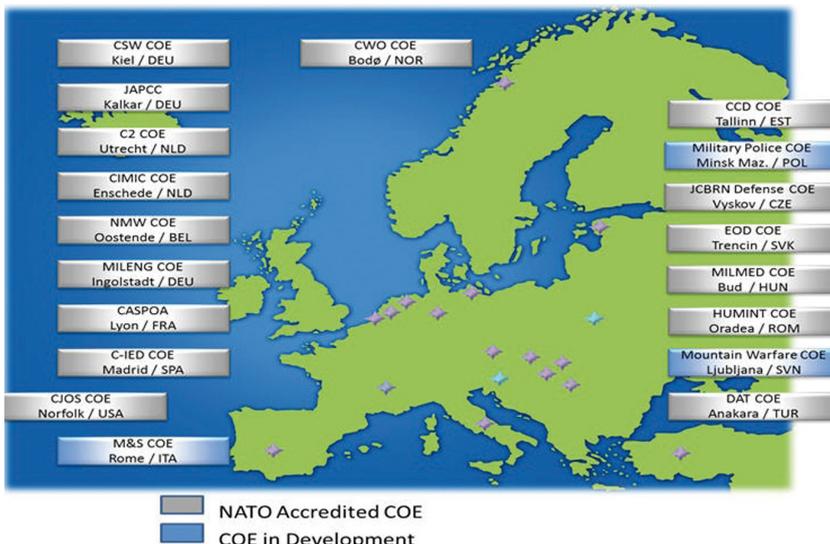
In accordance with provisions of the Concept for Centres of Excellence there exist limited opportunities for Non NATO or Non NATO Partnership nations to become Sponsoring Nations. As we know, the Partnership program remains an integral part of NATO's outreach and assists in the development of capabilities outside the formal NATO Command Structure (NCS). Many former PfP nations eventually joined the Alliance as full members (see map). Current PfP nations potentially provide a wealth of capabilities or occupy a unique strategic, geographical or historic position within the European continent. Thus these nations are often uniquely suited for membership in many of the current COE's. Thus, these facts normally facilitate a discussion on how Partnership nations can more effectively participate in the work of a COE. This appears especially true in a case where a Partnership for Peace (PfP) Country expresses its interest for deeper cooperation with the COE and obtaining the status of Contributing Participant (CP) is not enough. A Contributing Participant identifies any nation, organization or agency that is not a SN but provides a contribution in kind to the COE and uses the services or products provided by the

COE as agreed upon on a case by case basis by the SNs and the CP. In many cases a PfP nation as well as other countries or entities may bring additional value to the COE and there is certainly adequate reason for discussion on whether or not their participation can be covered by an agreement between them and the SN's.

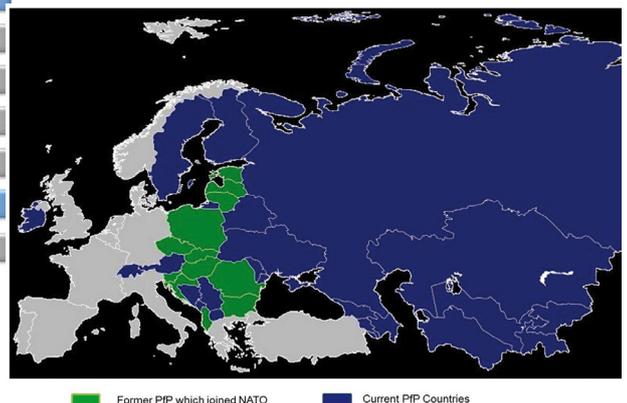
Within the COE, several discussions took place in this regard involving the identification of potential partners for conducting CBRN Reach back & Fusion (RB&F) Experimentation. Numerous PfP nations offered their services to assist in developing this required capability and the COE sought innovative ways to include them in the process while following all the rules of the COE as well as NATO information sharing procedures. The Operations in Confined and Shallows Waters Centre of Excellence (CSW COE) illustrates a practical example of how to deal with a situation of this type. In this particular case the PfP Country executes its involvement with COE work as a CP. This requires an agreement signed by the SN's and CP. Although this could be a time consuming process, there seems to be no other effective way to legally involve the PfP Country or national/international organization/institution more seriously into the daily work of the JCBRN Defence COE.

Author: Zdeněk Hýbl

Centres of Excellence Overview



Partnership for Peace Countries



Vilnius Training Synchronization Conference Brings New NATO Education Training Exercises and Evaluations (ETEE) Approach

Chilly February weather in Lithuania greeted the more than 200 participants of the Alliance as they gathered for what would be a very productive and informative conference. Members of the NATO Command Structure (NCS), as well as other NATO entities and Partnership for Peace (PfP) nations attended the Annual NATO Training Synchronization Conference held in Vilnius from 7 - 9 February 2012. For the first time in the history of the Conference, delegates from 15 NATO Centers of Excellence (COE), including the JCBRN Defence COE took part in the event.

The Supreme Allied Commander Transformation (SACT) - GEN Stéphane Abrial provided opening remarks to the Conference. He highlighted the many accomplishments of the Alliance over the past year and noted that the past year proved and extremely active one for NATO and her Partners. In particular he credited NATO's robust training program for the reduction in casualties and fatalities from Improvised Explosive Devices in Afghanistan throughout 2011. He also mentioned emerging changes in both Strategic Commands responsibilities for Education Training Exercises and Evaluations.

One of the most critical changes announced during the Conference was the completion of transfer of Collective

Training and Exercises management from SHAPE to HQ SACT by December 2012. This signals a monumental shift in how NATO conducts this key pillar of the Alliance's capability and may subsequently change how COE's, particularly the JCBRN Defence COE, supports these important events particularly our support to NATO exercises and the certification of the Combined JCBRN-Defense Task Force as part of the larger NATO Response Force (NRF) effort.

NATO also introduced the future policy for NATO Course accreditation and their Quality Assurance based on the Bologna Declaration (Standards for higher education). The policy focuses on Institutions vice individual courses and allows delivery of a Quality Seal to a greater number of institutions and providers through a detailed and transparent process. This is another important change effecting the future operation of the COE. NATO plans full implementation of the new strategy by 2015 and this modification will certainly bring additional challenges and opportunities in the accreditation process of the JCBRN Defence COE Courses. From a practical perspective, this means that courses introduced by the JCBRN Defence COE after 2015 might be delivered to a training audience significantly sooner than by current lengthy bilateral directives process. The Training, Exercise and Education Department (TEED) plans to

investigate the requirements to obtain the Quality Seal by 2015. Future efforts must focus on developing an implementation plan to take advantage of this new tool to enhance our CBRN training capabilities prior to the 2015 timeframe.

As a critical member of the NRF certification process and major supporter of NATO exercises, the JCBRN Defence COE remains extremely interested in the Military Training and Exercise Plan (MTEP) development cycle. Both SHAPE and the Joint Force Headquarters (JFHQ) provided briefs for 2013-2017 campaigns that identified the aims, dates and locations for all major exercises throughout the mid-term planning cycle. This data provides vital inputs to inform the Program of Work (POW) planning efforts within the COE and offers much greater fidelity to the Steering Committee in future budget deliberations.

The NATO Training Synchronization Conference offers an invaluable forum for sharing information and providing better insight in the diverse education, training and exercise issues existing within NATO. It also provides important information to the COE leadership to allow them to make necessary decisions to better utilize our scarce resources. We can expect even more changes in this dynamic area when the JCBRN Defence attends the next Conference in Riga in February of 2013.

Author: LTC Jaroslav Borek





Director's Farewell

After four years, my appointment as Director of the Joint Chemical, Biological, Radiological, and Nuclear Defence Centre of Excellence will end on 31 July 2012.

Although my upcoming posting is not surprising and I have spent much of the last year training and preparing for it, I must say that leaving this wonderful organization leaves me somewhat conflicted. Much of me would like to stay longer in my present position to continue to see the organization that we have nurtured together to flourish even more. I would love nothing more than to continue this important work with this outstanding team that you the nations have assembled here. As you all know since the beginning of 2008 when I took over, the COE has endured many dramatic changes. For certain, there is still much work to accomplish and there remain many issues still to be resolved within the JCBRN Defence COE. That, however, would always be true of any organization. The JCBRN Defence COE is exceptional body within the NATO and CBRN communities, and I am honored to be a COE member.

Beyond the daily work in our COE I would like to mention milestones achieved during past years even though I know in my heart that your greatest achievements still lay ahead.

1. Eight NATO nations and NATO's strategic commander for transformation signed the memoranda on 26 October 2006. ACT accredited the JCBRN Defence COE and it was activated as a NATO Military Body by the North Atlantic Council on 31 July 2007. Present, at the JCBRN Defence COE Opening Ceremony on 22 November 2007 were the Minister of Defence of the Czech Republic, the British Ambassador to the Czech Republic, and other important guests officially opening a new period of the JCBRN Defence COE development.

2. The JCBRN Defence COE is not a rigid body and continues to seek out new members. Its initial accomplishments in the field of CBRN defence convinced other NATO countries to join the COE. Our Polish colleagues signed the Note of Joining in September 2008, followed by Hungary in 2009 and USA in June 2011. The COE now proudly displays eleven flags, and as our activities and our reputation for superior contributions to the CBRN community continue to grow, I believe that the number of Sponsoring Nations will increase soon.

3. I have been extremely fortunate to witness many of the most visible and important developments in the COE undertakings. The JCBRN Defence COE's Program of Work transformed from a few activities in 2008 to the wide-spectrum of tasks it appears today. We progressed from passive participation at the many CBRN events we attended to an active role and many times a leading role in some of the most critical CBRN forums. The COE has taken the Chairmanship of the CBRN Doctrine and Terminology Panel and a COE representative chairs the CBRN NTG TG WTI. Additionally the COE Training Department supports training and certification of the JCBRN Defence Task Force for NRF and is a vital component to ensure NATO CBRN forces are ready and that important NATO exercises contain CBRN related objectives. Now the COE staff involves itself into a wide range of experiments all aimed to improve NATO's future capabilities to include identifying the requirements for implementation of a NATO CBRN Reach Back and Fusion Element and CBRN aspects in Maritime Interdiction Operations. The COE accredited CBRN courses and intends to increase their number most notably in the field of warning and reporting and potential aspects of CBRN modeling and simulation. The COE staff also devotes a part of its activities to support other COEs in their accreditation process. In this area COE SMEs cooperated with the MILMED COE in Hungary, EOD COE in Slovakia, HUMINT COE in Romania, Military Police COE in Poland and Modeling and Simulation COE in Italy.

The JCBRN Defence COE staff is professionally educated, dedicated, and competent. It was my pleasure to lead such an illustrious organization. Its achievements are something to be proud of. I am proud of every member of the JCBRN Defence COE staff and their unparalleled accomplishments. Its abilities fortify me and each member of the staff merits my admiration.

I am sure that the improvements and developments will only increase in the future, so that my successor will experience even greater success in the future. I know he is looking forward to being a valuable member of the JCBRN Defence COE, and with your continued support to further its current efforts and ultimately progress to even loftier heights of achievement on NATO's behalf.

I want to thank you all for cooperation and support during my mission at the JCBRN Defence COE. Especially to all my colleagues and their families I wish the best and I am looking forward to meeting and working with them in the future.

Colonel Zdeněk Cížek
JCBRN Defence COE
Director

This email address is ready for your
comments or questions!
newsletter@jcbrncoe.cz
JCBRN Defence COE Newsletter Team

JCBRN Defence COE
Víta Nejedlého
Vyškov
682 03
Czech Republic
Assistant phone: +420 973 452 805
Fax: +420 973 452 800
Mobil: +420 724 605 020
IVSN: 925 4200 452 805
E-mail: assistant@jcbrncoe.cz
Web: www.jcbrncoe.cz

*Editorial Committee: COL Randy Lee Smith, LTC Martin Peša, CPT Ilona Bain
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