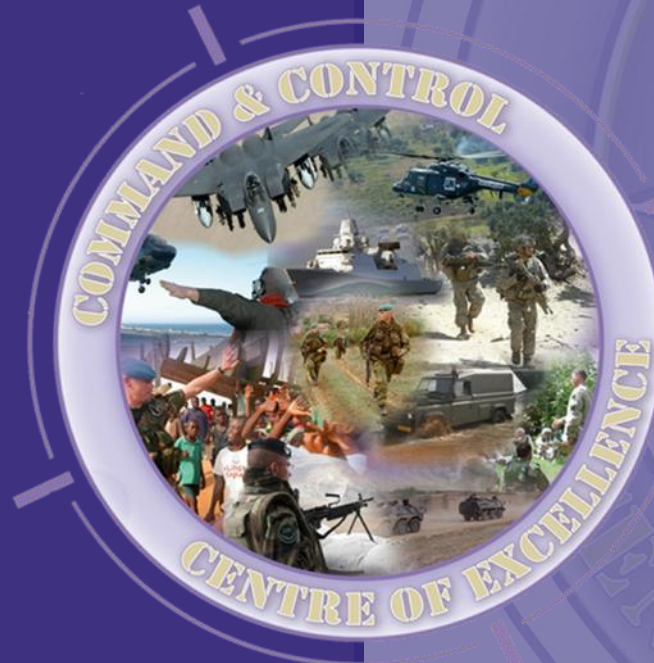




NEW COMMAND AND CONTROL CHALLENGES SEMINAR

19 - 21 March 2013, Bratislava, Slovakia

Catalysing the art of C²



www.c2coe.org

Review Document # 19

Seminar date: March 19 – 21, 2013



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Introduction

Dear Reader,
the Command and Control Centre of Excellence (C2COE), in close cooperation with the General Staff of the Slovak Armed Forces, organized from 19th to 21th of March 2013 the first seminar of 2013 on "New Command and Control (C2) Challenges" in the facilities of Hotel Mercure in Bratislava, Slovakia.

As a catalyst in the field of C2, we aimed to enhance the overall awareness of the new C2 challenges we have to face and to offer a forum for C2COE Sponsoring Nations (SNs), other Nations, NATO entities and other organisations to discuss seminar topics and sharing theoretical and practical experiences. We were very pleased with the offer by Slovakia to host this seminar and the opportunity to organise this seminar in Bratislava, as this supported our ambition to reach out to our SNs.

I am very happy to conclude that we reached our seminar goal. An international audience consisting of a wide range of organisations supported by high-level speakers presenting very informative and challenging lectures made this seminar very beneficial. This seminar would have never been a success without great speakers and audience; therefore I would like to convey my sincere thanks to all of you, to speakers and to all participants too. All constructive suggestions that were



provided have a great value for our centre in organizing future events.

I would like to express my special thanks to the General Staff of the Slovak Armed Forces for the outstanding support and the warm welcome we received during this seminar in Bratislava. We have received very positive and insightful feedback from participants about this excellent support.

Concluding this short introduction, it is an honour for me to offer you this Seminar Review Document. I wish you a good reading and hope that we will welcome you at upcoming events organized by our centre.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'A.P.P. Visser', written over a white background.

A.P.P. Visser
Director C2CoE
Colonel NLD A



You are being presented with the Seminar Review Document the Command and Control Centre of Excellence publishes after each seminar. These Seminar Review Documents give the reader an overview of the event, highlights, the main topics and provide some of the lessons identified. This document will provide only the key themes of the seminar and is not an entire summary of all the briefings.

Executive Summary

The C2 seminar was held in the facilities of Hotel Mercure in Bratislava, Slovakia, from 19th to 21th of March 2013. As many different C2 challenges were addressed, this C2 seminar was a great success.

Seminar presentations covered a wide variety of topics and issues related to current C2 challenges, including introduction of the theory of Network Enabled Capability (NEC) and the development of the new NATO NEC criteria, our experiences from NRF assessments and recent NATO operations (OUP, ISAF, Ocean Shield), the impact of Comprehensive Approach (CA) and Information Management (IM) on C2, the new NATO Command Structure and NATO Force Structure, critical aspects of C2 such as cyber security, social media as well as the C2 way ahead.

For a follow-on seminar the participants are mostly interested in human factors and aspects in C2, Future Mission Network (FMN), C2 in NNEC and Comprehensive Approach. For consideration there are other possible topics such as: the impact of the financial crisis on

C2/NNEC, new C2 systems currently in development, future challenges and solutions for C2.

The audience underlined that this seminar provided an excellent overview on the development of C2 from a different perspective and situational awareness on C2 challenges NATO is facing. It was also a great opportunity to learn about C2, improving the military knowledge and background as staff officers. The diverse background of participants provided interesting insights and a good discussion forum. Moreover, the seminar was a great opportunity for networking, exchange of C2 ideas and views, and to enlarge the C2 community.

Some attendees suggested that this seminar should be a part of an educational program for all personnel before their deployment to NCS or EU structure.



Seminar facts

Background

New technology and the accelerating rates of change profoundly altered command and control within a military and also between military and civilian leaders. Cultural change also involves a radical shift in the way of information sharing: moving from a "need to know" to a "need to share" culture. Cyberspace and Social media will play a particularly important role in the years ahead. The future security environment is likely to be more unpredictable, complex, and potentially more dangerous than today and requires greater speed in the planning and conduct of military operations. This new operational environment leads to more C2 challenges.

Seminar Aim and Objectives

The aim of this C2 Seminar was to enhance the overall awareness of the new C2 challenges we have to face and to offer a forum for C2COE Sponsoring Nations, other Nations, NATO entities and other organisations to discuss seminar topics and share theoretical and practical experiences.

The Seminar objectives:

- present and discuss the current C2 challenges in recent or ongoing operations, NRF and C2 way ahead,
- introduce the theory of Network Enabled Capability (NEC) to the audience and the development of the new NATO NEC criteria,

- share the C2COE experiences from NRF assessments and operations (OUP, ISAF, Ocean Shield),
- present the new NATO Command Structure (NCS) and NATO Force Structure (NFS),
- inform the audience about the impact of Comprehensive Approach (CA) and Information Management (IM) on C2,
- identify possible critical aspects of C2 such as cyber security, social media etc.

The Seminar was also aimed at the possibility to extend or maintain social networks.

Seminar agenda

The focused three days seminar sought to achieve its aim through a combination of presentations and discussions. Detailed information about seminar topics are available in the program of the seminar in Annex A.

Moderator of this seminar was LtCol Achim MUELLER (DEU AF), Deputy Director C2COE.



Seminar attendance

The seminar's primary audience consisted of individuals working in C2 and NEC related positions within NATO Nations. Nevertheless, we attracted some non-C2-experienced personnel too.














14 speakers from nine different countries (CAN, DEU, ITA, NLD, NOR, SVK, ESP, UK, USA) and nine different organisations (NATO HQ/IMS, NATO HQ SACT, SHAPE, EUMS, Defence R&D Canada, DEU

Joint Signal School, NLDA, CCD COE, C2COE) provided 15 briefings for 80 participants from 13 NATO countries and 42 organisations.

58 attendants were high rank officers (OF3-OF5) with various backgrounds and experiences. This all contributed to fruitful discussions related to C2 not only during the briefings but also during networking breaks and a social event.

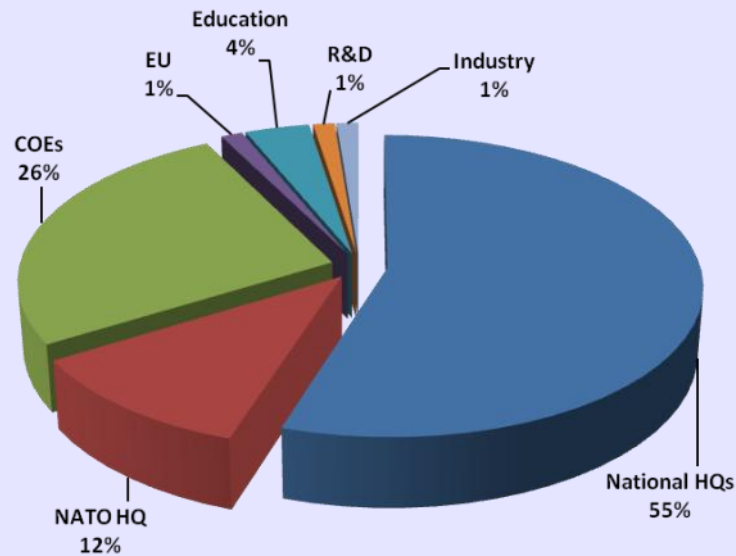


Audience Breakdown - Nations

Belgium		4	Norway		2
Canada		1	Romania		1
France		2	Slovakia		15
Germany		15	Spain		3
Italy		9	United Kingdom		2
Lithuania		1	USA		5
The Netherlands		20	Total		80



Audience Organisational Breakdown



Evaluation of the Seminar

The seminar was evaluated by the participants by filling a short evaluation form at the end of the seminar. Out of 80 seminar participants, 41 answered the questionnaire with their assessment of the quality of the seminar.

On the question about the overall quality of the seminar, 49% of the respondents rated the quality as excellent. Another 49% rated the quality as good.

On the question if the topics/speakers of the seminar met the expectations of the participants, 20% of the respondents stated that the topics/speakers excellently met their expectations and another 70% of the respondents rated this as good.

All respondents reported that they would recommend this seminar to a colleague.



Topics/speakers meet expectations



Introduction to the Seminar



LtCol Achim MUELLER (DEU AF), Deputy Director C2COE

Many factors influence the success of a mission, some of these are:

- Dynamic environment
- Complexity and chaotic environment
- Unknown futures
- Unpredictable states
- Rapidly changing situations
- New, diverse circumstances
- Unexpected events
- Unfamiliar situations
- Changing tasks, purposes
- Loss, Damage, Threats.

And if this is not already enough to cope with, there are defence budget cuts, shift of focus within the policies and doctrines of NATO nations, as well as the (hopefully) end of NATO's combat operations in Afghanistan.

Therefore, NATO tried to find and define a new way to cope with this situation! And that was called SMART DEFENCE!

Citing Secretary General Rasmussen from his speech at the 2012 Munich Security Conference:

"...Smart Defence is a long-term strategy to deliver the right capabilities right across the Alliance. But capabilities alone are not enough. These capabilities need to be able to work together – and our troops need to be able to work together too. This is what some in NATO jargon call, "interoperability", but I believe it is more than that. It's the ability to connect all our forces. Common understanding. Common command and control arrangements. Common standards. Common language. And common doctrine and procedures. It concerns everything we do as an Alliance."

Thus, C2 plays a prominent part in achieving the aims of Smart Defence.

This is also emphasized by LtCol Lou Marich (USA A), in his essay at the Staff College:

"...C2 is the critical primary tool needed for success in multinational operations and that commanders must actively build relationships, trust, cooperation, and cohesion; overcome language and cultural barriers; develop common procedures or norms; and establish effective communication means, technical as well as procedural; ultimately leading to true interoperability among the members of a multinational force."

This seminar attempted to highlight the challenges imposed on C2 and tries to define what it means in regard to NATO NEC, Cyber Security, Social Media, and other issues. Sometimes it is hard to distinguish between new challenges and the continuing old challenges. During his preparation for seminar he noticed that some things, which are sold as new, are actually part of warfare throughout the times. For example AGILITY. Hannibal, Caesar and Napoleon, as well as many other historical persons, had their idea about what agility or even C2 agility meant to them and their ways of fighting a war.

Presentation by **Brigadier General Josef POKORNÝ, Ph.D.**, Chief of the Strategic Planning and Capabilities Development Division, General Staff of the Armed Forces of the Slovak Republic, Bratislava.

Seminar Keynote speech

Command and Control of the Slovak Armed Forces in the context of the Strategic Defence Review

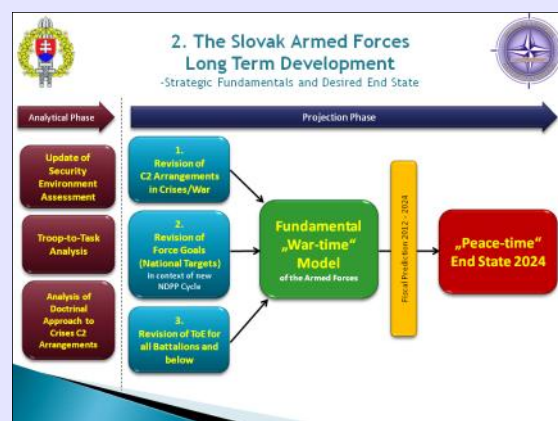
Keynote speaker of the Seminar, BG Josef Pokorny, presented a briefing in the context of the Strategic Defence Review (SDR). Most NATO nations are undergoing dramatic changes as a result of lower budgets. Also the Slovak Armed Forces (SAF) are forced to shrink because of the same reason. In his introduction the General referred to his police background with regard to Comprehensive Approach.

The reorganising process of the Slovak Armed Forces is called "Long Term Development Strategic Fundamentals". The General named some circumstances that influence the way of reorganising the SAF. First of all the fact that the SAF are young forces, in existence for just 20 years. Secondly the personnel reductions have been significant, with 20 400 personnel as the final goal. As an example he mentioned that the number of colonels was reduced from 500 to 75 in eight years. He explains this process with the question: "With whom do we go to war, soldiers or colonels?" A good balance between soldiers and officers is essential for effective and efficient forces. Third, is that since 2006 the SAF have been filled with fully professional personnel. Last but very prominent, he mentioned the decrease of the defence budget. Slovak Republic spends 1% of its GDP on defence, slowly increasing again in 2015. Above elements influence the reorganisation

process and the general emphasized the huge challenge he faces by taking into account that the Slovak Government didn't want to lower its military and political ambitions.

The Long Term Development Strategy has the following aims:

1. Increase compliancy of national plans with NATO plans
2. Improvement of the internal C2 structure
3. Increasing the unity of effort within the SAF
4. Modernisation of armament
5. No loss of existing capabilities



Linking to the subject of the seminar, the general concluded his presentation by explaining how the SAF's peace-time C2 organisation differs from the C2 organisation in war-time.



The Challenges of Command and Control



Dr. Farrell led the formal presentations on the first day of the Seminar with an intriguing and informative presentation on C2 challenges within environmental and collective complexity. He highlighted specific challenges leaders and organizations face in complex situations, and how these challenges impact the environment in which they operate. He also described the complexity in “self” (or the “collective” whole).

Characteristics of C2 challenges represented among entities in the environment and in the collective included (but not limited to):

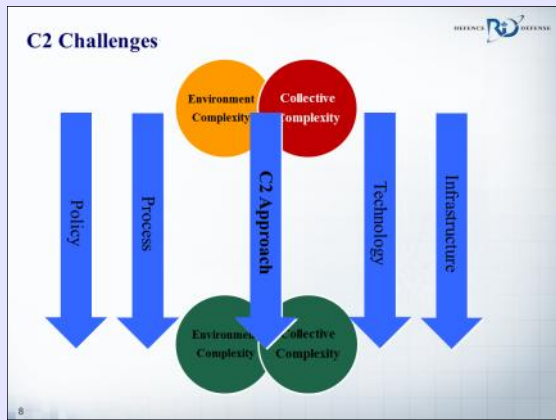
- number of entities involved in the environment or situation
- differences in established cultures, norms and values
- trust or lack of, between and among the entities
- difference in language, information and communications capabilities; and
- differing approach to governance and management.

Dr. Farrell continued his briefing by providing a comparative description of C2 between military doctrine and the academic community. He referred to the military doctrinal definitions in NATO (1988) and Joint

Publication 1-02 as “individually focused,” while Alberts & Hayes (2006), and Pigeau & McCann (2000, 2002) definitions lend that C2 is a “team focus.” These contrasting definitions of C2 showed how C2 might be changing as operations move from the industrial age to a net-centric age.

Dr. Farrell continued his presentation by outlining many of the C2 challenges leaders face in complex environments. His descriptions, while using such key words as objectives, diversity, military contribution, and unity of intent related well to his audience of multinational military and academic professionals. Dr. Farrell transitioned to explain the use of a proposed decision aid that could assist commanders identify the complexities of their environment and increase situational awareness. His model described a sliding-scale approach to C2 challenges through the transition of environmental and collective complexities utilizing policy, process, technology, and infrastructure. He continued by introducing a three-dimensional model describing the five C2 Approaches within the domains of: Conflicted, De-Conflicted, Coordinated, Collaborative, and the Edge. His model highlights the aspects distribution of information among entities, patterns of interaction among entities, and allocation of decision rights within constrained and unconstrained environments. Dr. Farrell concludes

that the C2 Approach model serves as a “toolbox” to leaders as a mechanism to deal with complex environments.

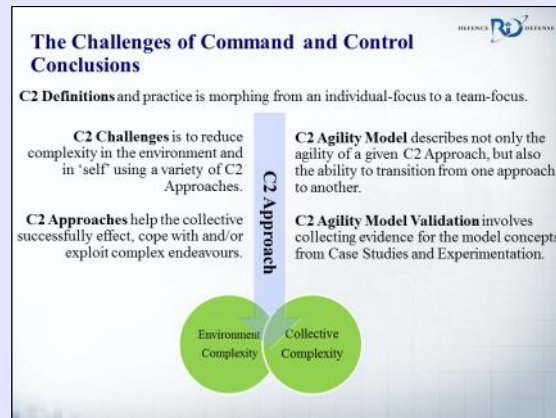


Dr. Farrell asked his audience to ponder whether a particular approach of C2 is effective for all situations and that this leads to the ideas of applying a C2 Agility Model that consists of two main concepts: C2 Approach Agility as the agility of a particular C2 Approach described in terms of the six enablers or components identified as: adaptive, responsive, innovative, resilient, flexible and versatile, and C2 Manoeuvre Agility as the collective’s ability to transition from one C2 approach to another as situation complexity changes. The C2 Agility Model provides manoeuvrability to meet the

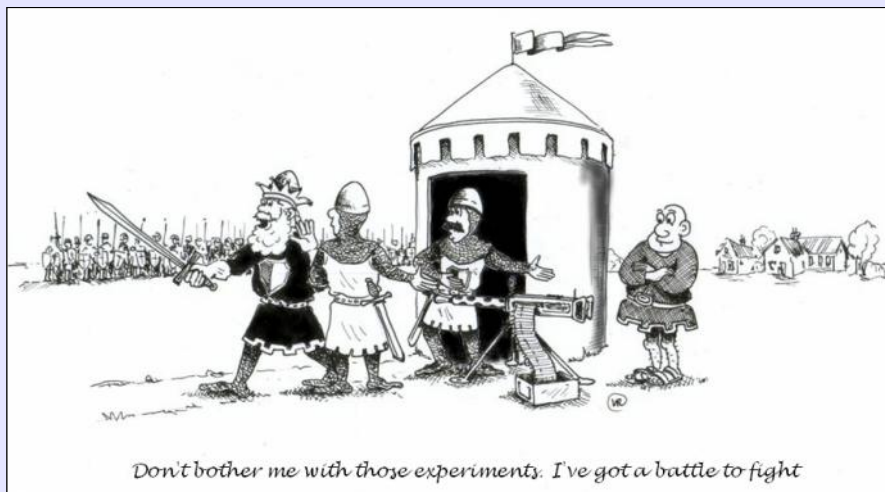
demands of a specific mission or environment, thus remaining flexible enough to adopt an approach as the mission or environment changes over time.

Conclusion

Dr. Farrell indicated that definitions revolving around C2 are beginning to transition from an individual-focus to a team-focused approach.



He ended his briefing by providing a way ahead for C2 Agility focused on reviewing, publishing and distributing the SAS-085 Report, developing material for inclusion into the military education, consideration into all aspects of organizational design, and propose follow-on C2 Agility research and experimentation to further refine the model.



Presentation by **LtCol Rob TRABUCCHI (USA A)**. He has served in the Plans and Policy Division of NATO's International Military Staff in Brussels, Belgium since 2009.

Comprehensive Approach



LtCol Trabucchi's presentation was a summary of NATO Nations' guidance for NATO's contribution to a Comprehensive Approach (CA) in crisis management by the wider international community; some consequences of this approach on C2 – included examples from NATO's operations and other cooperation. Best practice examples for practical implementation at the strategic and operational levels were also discussed.

There are at least 2 levels of policies which provide for NATO's contribution to CA:

- top level: very broad (Strategic Concept) or the overall CA Action Plan
- policies about specific subjects which we've now updated to incorporate CA-thinking

There has been a tremendous amount of recent implementation from the 1st level into that 2nd level and down into military doctrine.

NATO's policy for its contribution to a CA to crisis management by the wider international community can be summarized simply & remembered easily through a developed model "4, 3, 2, 1":

- Four "Strands of Work" ... woven together
 - Enhanced Co-operation with External Actors
 - Planning and Conduct of Operations
 - Lessons learned, Training, Education
 - Public Messaging
- Roles of three levels
 - NATO HQ
 - Operational (SHAPE & JFCs)
 - Theater (JFCs and Force Commanders)
- Two aspects (internal and external) to balance
- One international 'Design'

These Four sets represent the essential and major components of our Nations' guidance to us on the subject. They are parts of a whole which is more coherent than much of the academic literature about CA has recognized to date, but seeing them as parts of a whole is easier with some further explanation of each component.

We see that generally speaking, the role of the Command and Force Structures focuses on implementing cooperation agreements, deepening those relationships through real cooperation on the ground, and then capturing lessons from that experience for our training & education. As well as for demonstrating success to our stakeholders and general public's, which in turn strengthens the relationships again, keeping the cycle



moving forward in a positive, reinforcing way.

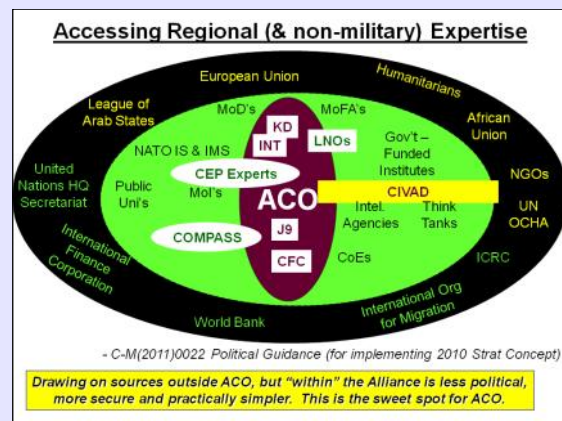
Internally, NATO seeks to apply the Alliance's own military, civil and political instruments coherently. In military terms, Unity of Effort.

However, the Allies' all agreed that too much NATO can lead to too little of the other experts and organizations whose capabilities are so critical to solving today's conflicts. Therefore Allies continually emphasize in all CA-related policies the external aspect that NATO always prefers to act as a contributing member of the wider international community. A comprehensive (or international) strategic design is basically about building agreement on goals and roles.

These are the foundation for cooperation; they are underpinned, strengthened by sharing our assessments of the situation, so we

can find common ground on the desired outcomes.

NATO has made great efforts to make a reality of its policy by creating organizations fit-for-purpose. They are equipped with the guidance and processes which are described elsewhere in this briefing and are increasingly augmented (on-call) with skill sets required to harmonize NATO actions with non-NATO actors.



Presentation by **LtCol Rob TRABUCCHI (USA A)**. He has served in the Plans and Policy Division of NATO's International Military Staff in Brussels, Belgium since 2009.

C2 in Complex Crises

LtCol Rob Trabucchi of the US Army working for the NATO International Military Staff, presented a framework to recognize and organize complex environments. This framework is based on the ACID (Adaptive, Connected, Interdependent & Diverse) model. This model was developed and credited to Dr. Scott Page, Dr. John Holland, Dr. Robert Axelrod and Dr. Michael D. Cohen from the University of Chicago.

The focus of the presentation was to recognize and mentally organize complex environments. The model

is comprised of the following complexities: Adaptation, Connection, Interdependence and Diversity. The ACID model is



used to describe the complexity of crises by coping with & harnessing complexity. LtCol Trabucchi examples of how to deal with the different "qualities" of the framework.

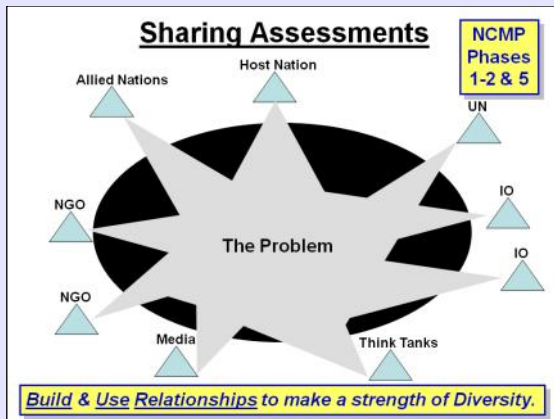
LtCol Trabucchi referenced Diversity and Interdependence of stake-



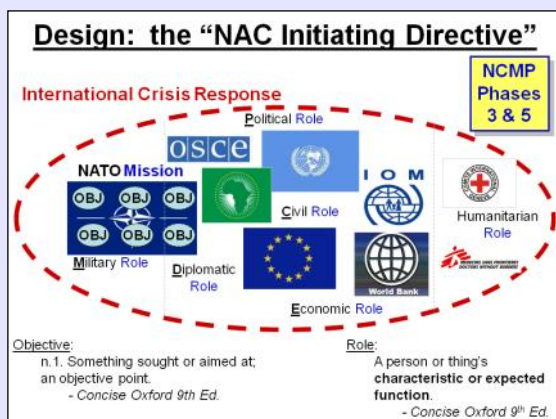
holders as two of the primary problems within complex crises.

The speaker explained in situations, challenges can be changed into strengths. Diverse actors have diverse perspectives on the crisis/problem(s). Each actor identifies aspects of the crisis alternative to other individuals' perspectives by utilizing their unique skills, specialties and position. Therefore, they can contribute to a unique and complimentary assessment.

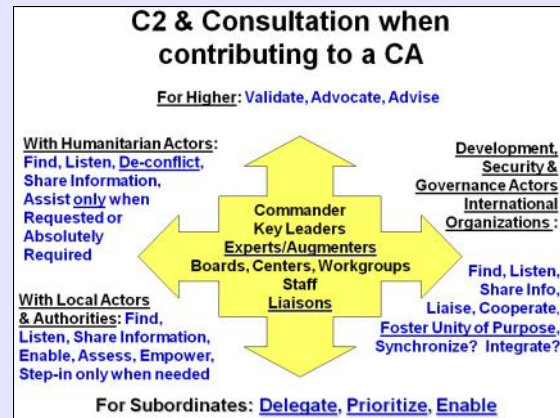
By incorporating more actors into communication and information-sharing arrangements, we allow them to share these complemen-



tary perspectives and assessments. Each actor can benefit from the other (effectiveness) while focusing their own efforts on their own core competencies (efficiency).



LtCol Trabucchi provided examples of application of diversity and interdependence in command and control in operations, including options for addressing both challenges and opportunities at the strategic and operational levels.



Finally, LtCol Trabbuchi elaborated on harnessing Complexity. Relevant actors in the Operating Environment are adaptive, the staff must enable the process of command, assessing, learning and re-design. If these actors are interdependent, the staff must cooperate and harmonize. If actors are diverse, the staff must be capable of exploring and learning. In a complex environment almost No-one controls anything, but everyone influences almost everything.



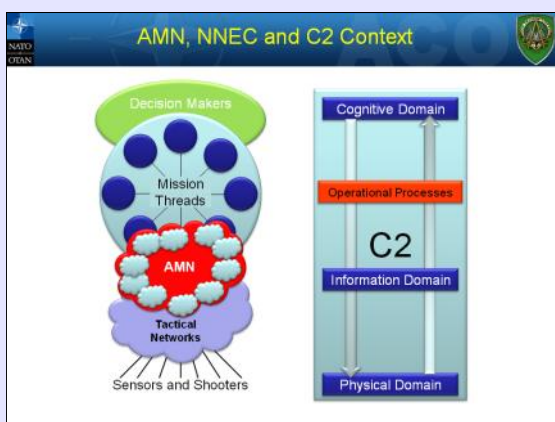
Presentation by **Wg Cdr Allen WILSON (GBR RAF)**. He works in SHAPE J6 as the requirements Officer for ISAF CIS.

CIS Support to ISAF C2, AMN - FMN Implementation

Wing Commander Wilson started his presentation explaining how the complex C2 relationship with the J6 staff at the higher operational and the operational-tactical level HQs (IHQ and IJC HQ) is responsible to the Commander for the architecture and services. The J6 support the war fighter by providing support to what are defined as Mission Threads: Battlespace Management (SSA & C2), Joint ISR, Targeting & Fires, Freedom of Movement, C-IED, Force Protection and Medevac are considered the core MTs.

AMN

In 2009, it was recognized that ISAF operational success would rely on the ability to seamlessly exchange information throughout the coalition. The Afghan Mission Network (AMN) is absolutely essential for the war fighter as it enables integrated C2 and Shared Situational Awareness (SSA) on a single Information Domain.



For this alliance coalition mission, the AMN ensures operational level coordination and tactical level in-

tegration of national level deployed forces. This was the first time that a coalition operation built an interoperable and federated network to connect the higher level HQ (NATO) and the troop contributing nations at the tactical level. Integration at the HQ level has been a success and the AMN Core network maintains full two-way trust with each National Network Extension to establish a single ISAF federated common domain.



The operational community is supported by functional services that are integrated in 14 ISAF MTs. This is enabled through the AMN, which supports Coalition C4ISR and supported joint J2 / J3 / J5 activity. The COM and his staff are more aware of the tactical level situation as theatre wide exploitation is more effective, and IHQ can better coordinate the campaign and guide the comprehensive approach.

How do traditional NNEC domains and the AMN integrate C2 at the federated network level? This is achieved by linking the various operational level MTs and the tactical level sensors and shooters (Joint ISR and Fires) while providing decision makers with the SSA



environment to ensure they are able to provide timely operational C2 to the forces. Therefore, the AMN federated and interoperable C2 architecture and operational processes is the “connector” between the cognitive domain and the information domain: AMN assists C2 up and down the chain of command.

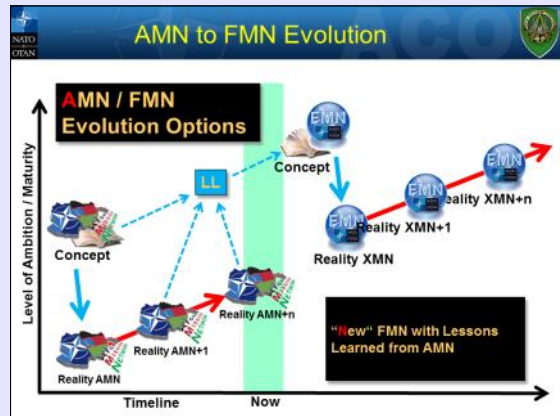
The AMN and the tactical national networks constitute the information domain. The use of MTs is recognized as a very important element of defining the Information Exchange Requirements to be handled by the Information Domain and is one of the key factors in the success of AMN.

FMN

The Military Committee (MC) tasked ACT, in close coordination with ACO, to develop a generic Future Mission Network (FMN) concept informed by the best practices and lessons learned from the implementation of the AMN, and was approved in November 2012.

In line with the AMN, the FMN must enable integrated C2 and SSA on a single Information Domain. For any alliance or coal-

ition mission, a mission network will ensure operational level coordination and tactical level integration of national level deployed forces.



The FMN standing capability will be a collection of the components (doctrine, process, information and assets) that can be assembled and reconfigured as needed to enable interoperability verification, testing, certification, training to support different initial mission requirements. This capability component should be based on a Service Oriented Architecture (SOA) with web-based enterprise services and includes Human-to-Human Communication Services, and operational community defined essential User Applications supported by the Community of Interest (COI) foundation services.

"Coalition forces within Afghanistan cannot communicate effectively and share theatre related operational Commander's guidance, information and intelligence. These communication gaps increase risks to life, resources, and efficiency."

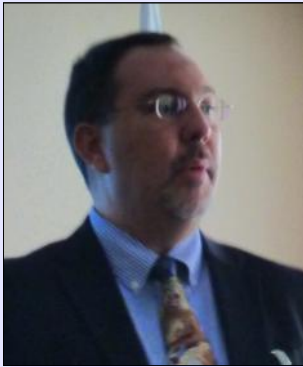
GEN McChrystal, former COMISAF

A gathering for an icebreaker in the “Restaurant Bakchus” Bratislava concluded the first day of the seminar. Colonel Jan SEKELSKY (General Staff of the SAF) and Colonel A.P.P. VISSER (Director C2COE) opened this event and welcomed all participants. The participants took the chance to have informal discussions with speakers and met each other in a very pleasant atmosphere.



Presentation by **Dr. Alberto DOMINGO**. He works in C2DS Division, THF Branch NATO HQ SACT.

NNEC and development of new criteria



The NATO Network Enabled Capabilities (NNEC) programme focuses on increasing technical and (mainly) non-technical inter-

operability to facilitate information sharing and exploitation in coalition operations. Since 2012, NNEC has moved from concept development into actual implementation.

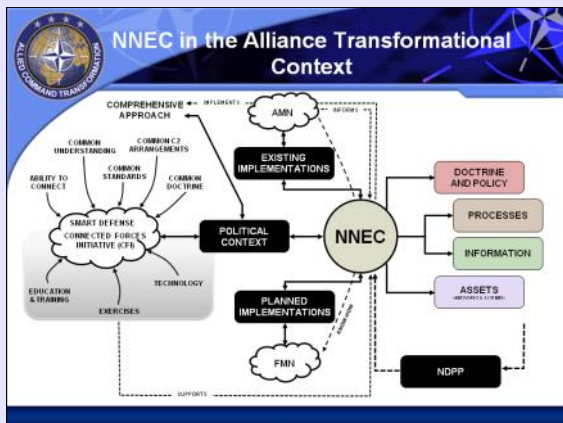
Dr. Alberto Domingo provided an introduction to NNEC and the inter-related concepts and initiatives in NATO and the nations (such as the FMN, the Connected Forces Initiative (CFI) or the Comprehensive Approach (CA), among others).

tion, etc.) were processed by the NNEC Processes which ultimately produced Outputs such as metrics, tools, lessons identified, lessons learned, etc.

Conclusion

NNEC is considered a pivotal concept for enabling operations of the Alliance. NNEC supports the Comprehensive Approach and is the core of the Future Mission Network. CFI will be the vehicle for Alliance-wide implementation.

The NNEC Body of Knowledge contains direction and guidance to implement NNEC in any capability. The NNEC criterion is a powerful tool for specification (of NNEC-compliant) and assessment (of compliance) of capabilities. This has been proven numerous times in the past. ACT and the C2COE are partners in an effort to disseminate knowledge, guidance and tools, and achieve the full potential of NNEC.



The brief provided a short introduction to the NNEC lifecycle and the tools developed by NATO HQ SACT to implement NNEC. The NNEC lifecycle showed how inputs (political guidance, level of ambi-

What NNEC is...

- NNEC is:
 - A desirable characteristic for all C4I capabilities.
 - Applicable to all capability development phases.
 - Maximum expression of (technical and non-technical) interoperability.
- NNEC is achieved by simultaneously **working at the four NNEC Components**:
 - Technology (networks and systems).
 - Information (contents and handling).
 - Processes.
 - Policies and doctrine.



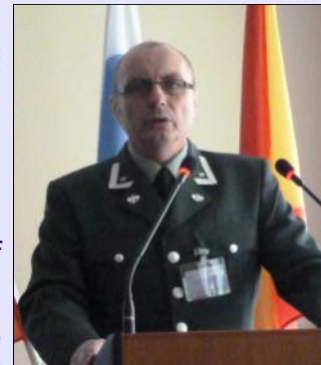
*P*resentation by **Maj Steinar SVALSTAD (NOR A)**. He has been member of the Expertise Management Branch of the C2COE since August 2008.

Best Practices from NNEC assessments

The past five years, C2COE has conducted assessments during NRF exercises and current operations. The presentation covered findings with NEC relevance that has been observed during these assessments. His presentation focused on Best Practices and Lessons Identified related to the Doctrine, Organisation, Training, Materiel, Leadership, Personnel, Facilities, Interoperability (DOTMLPFI) and NEC maturity level (NML) model.

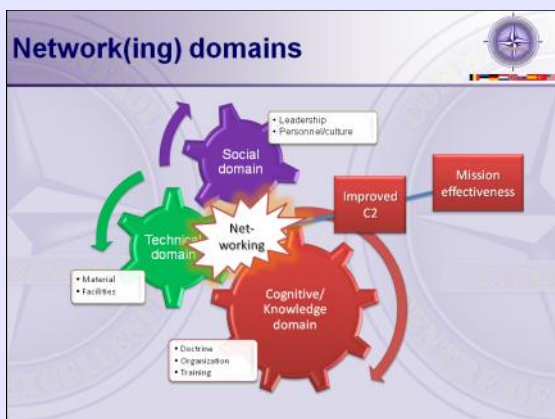
To put the findings in perspective, some definitions were provided. The findings C2COE obtained during assessments are related to the definition of C2 and NNEC; personnel, equipment, communication, facilities and procedures are covered in the definition of C2 and the

During assessments, C2COE has conducted self assessments instead of formal evaluations of the units; feedback is given directly to the commanders.



In the cognitive / knowledge domain the most significant observations are that units should use all Lessons Identified (LI) in the development of doctrine and standardization of IM plans in accordance with the NATO IM regulations. All training should be standardized in accordance with the following principles:

- train as you fight,
- minimize the difference in procedures / processes between peacetime and conflict
- Social networks should be incorporated as part of the training,
- Encourage building of social networks as a way to overcome cultural differences,
- Key leaders and staff with a focus on practical training
- IS tools training; all tools should be available nationally, so training can be conducted before deploying



definition for NNEC explains that everything is relevant, no factor is less important than the other. Information Management (IM) and Information Sharing (IS) were not directly covered, but they imply these challenges are relevant today and in the future.

New technology is always available, and in the Technical Domain, exploration and development of new and improved IM technology should be considered, but the most



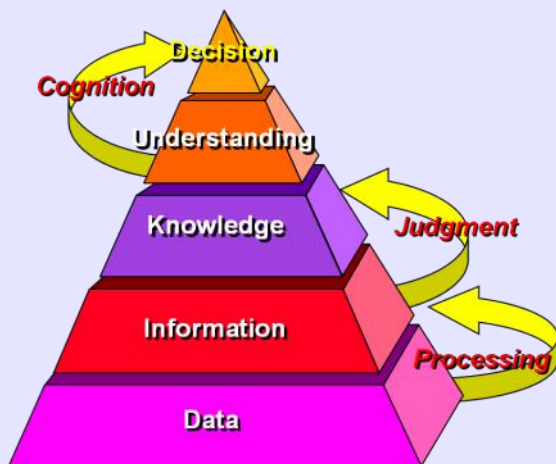
significant area is that all units should have a Document Handling System (DHS) available during missions and during training.

Social Domain is the domain that involves the human factor, and one observation is that micromanagement is all too commonly exhibited. Leaders should exercise leadership through guidance, training and reinforce the synergy between clear direction, guidance and trust among



their staff. Liaison Officers are very important, a clear guidance should be established including; roles, responsibilities and use a selection process to pick one that fulfills all requirements.

IM is important to all aspects of your operation; this should be recognized and implemented at all lev-

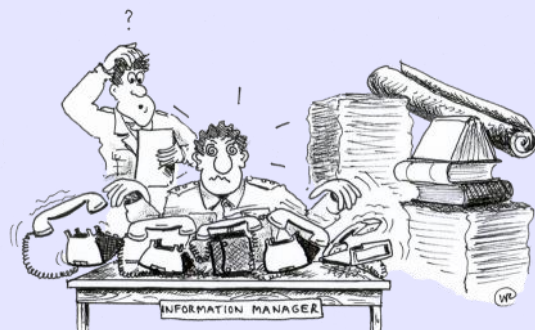


els, addressed as a theatre-wide issue rather than only as a singular issue for each Headquarters. It requires emphasis from senior leaders and their involvement, strengthens individual responsibility and the achievement of organization goals.

IS is a topic that everybody talks about, from "Need-To-Know" to "Need-to-Share". Trust among coalition partners must not be taken for granted. When operating in a multinational environment, special attention should be placed on achieving trust among partners. To achieve trust, NATO and Nations should promote a cultural awareness program and establish a unique framework among NATO and Nations outlining the scope, roles, responsibilities and methodologies to compliment the Comprehensive Approach.

Conclusion

Challenges in C2 will always exist, but to be able to improve C2, more emphasize on Information Management and Information Sharing through training, education, Best Practices and Lessons Identified is a very good start.



"Being a captain (OF-2) is difficult to act as IM, I can only make suggestions".



Presentation by **LtCol Grady WALSTEIJN (RNLAF)**. He is a member of the C2COE since March 2011. He works in the Operational Assessment Branch.

Consultation C2 in recent NATO operations (OUP, ISAF, Ocean Shield)

LtCol Walsteijn started his presentation with a short description on the Command and Control Centre of Excellence which is located in Utrecht in the Netherlands. The C2COE provides expertise and analysis on C2 during operations and NRF exercises. C2COE Assessments are primarily focused on Information Sharing and Information Management both from a NATO Comprehensive Approach and the NATO Future Mission Network perspective.

During the Chicago 2012 summit, NATO agreed upon three initiatives: Connected Forces Initiative (CFI), Smart Defense (SD) and Partnering with Nations. The CFI brings the NATO guiding principle of standardization into the cyber environment. The SD initiative implements the economic principle of doing more with less. Partnering with nations provide the synergy which is more than the sum of the individual parts. Collaboration of IS and proper communication is of high importance. Through CFI, SD and partnering NATO, multiplies these effects in operations and exercises.

The briefer explained that the C2COE has gained its assessment experience during NNEC assessments from NRF rotation 9 till 17. Best practises have been summarized in the C2COE's NNEC Best Practices Handbook and C2 in a Network Enabled Environment.

He started with operation "UNIFIED PROTECTOR" (OUP) by giving a short introduction on the NATO operation in Libya, in which NATO took control of

military operations under United Nations Security Council Resolutions 1970 & 1973 on 31 March 2011. The aim of OUP was to protect civilians and civilian-populated areas under attack or threat

of attack. He described that the Libya operation was conducted in a complex environment in cooperation with a number of international partners in addition to the UN, including the African Union, the Arab League and the EU.

During OUP the C2COE participated in two assessments. The first took place during the first 3 weeks of the operation. This assessment was executed together with the NATO Joint Analysis and Lessons Learned Centre (JALLC). The objective was to assess the C2 processes of the newly activated Combined Joint Task Force Headquarters OUP in Naples. Later that year the C2COE also contributed to the SHAPE strategic assessment of the Strategic and Operational planning process. Main conclusion of the assessments was that NATO showed its ability to act quickly and decisively. Under great international pressure the OUP HQ demonstrated its capability to rapidly organize and command a large scale operation. However, diffused lines of C2 and unclear political choices were a challenge on C2 processes. The second assessment contributed to SHAPE's strategic assessment team. Main observations were:



The NATO Operational Planning process required direct liaison authorization with non-NATO actors. Furthermore, political end-state conditions were not sufficiently defined and Nations did not effectively and efficiently share national intelligence and targeting information. Concluding that the NATO Intelligence Warning System did not provide sufficient, timely strategic warning of the impending crisis in Libya to NATO decision- and policy-makers. He also mentioned the shortages of key personnel and concerns about the reduced effectiveness of the HQ arising from the short duration tours of some assigned personnel as the result of national caveats.

AMN/FMN study

Since its inception the AMN concept has been identified as an innovative concept and as the foundation for the way FMN could be defined, developed and implemented in support of military operations. In support of that FMN concept development, the C2COE was requested to conduct an AMN/FMN Study in order to contribute to the development of FMN requirements. C2COE was to provide recommendations in the Focus areas; Information Sharing and Information Management for FMN requirements. The AMN/FMN study was done within the context of the ISAF C2 Structure on all 4 levels of commands from ISAF HQ down to Taskforce level, taking into account the principles of the CA. Info Sharing has significantly improved within the military C2 structure but not between ISAF and non-ISAF. The need to synchronize diplomatic, development and security efforts in order to achieve the final mission is an unquestionable must for future operations. It was also concluded that AMN could be considered as an initial model

for a FMN when dealing with IS requirements within the military C2 structure, but will not fully support in-theatre commanders unless the FMN addresses the complex CA environment. IM differs between the different levels of command. IM is currently not addressed as a theatre-wide issue but rather as a singular issue for each HQ. Room for improvement was observed in leadership emphasis on the importance of IM. In sum, it was concluded that the AMN could be considered as an initial model for a FMN when dealing with IS requirements within the military C2 structure, but will NOT fully support in-theatre commanders unless the FMN addresses the complex CA environment. The establishment of an unclassified network on which military and non-military actors can operate and share information is considered as a critical FMN requirement.

Operation Ocean Shield (OOS)

The final part of the briefing was on OOS. The C2COE executed a study on international cooperation in Counter Piracy operations. The focus was on the common awareness of capabilities of these Counter Piracy task forces and information sharing between these task forces of the Horn of Africa. The study started in August 2012 with interviews at the Operational Level at Maritime Command Northwood and concluded with an in-theatre assessment at the tactical level at the NATO Counter Piracy task force 508 in the November-December 2012 timeframe. The study concluded the importance of the use of the unclassified Mercury Network and the important role of social media which had opened a wider window for the outer world to look into the heart of NATO counter piracy operations.

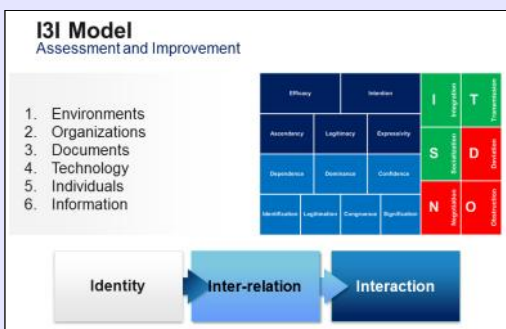


Presentation by **Mr. Gijs van den HEUVEL**. He works as a consultant at **SHAPE** where he leads a project to identify the information exchange requirements for the Comprehensive Crisis and Operations Management Centre (CCOMC).

Information Sharing and Comprehensive Crisis and Operations Management

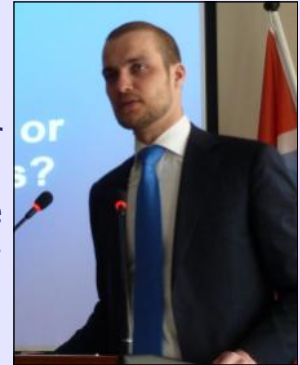
Comprehensive crisis and operations management requires information from a wide variety of military and non-military organizations. Effective information sharing is therefore essential for mission success. In conducting comprehensive crisis and operations management, however, there are challenges including the large diversity of information, different technologies, and the wide variety of military and non-military organizations. To manage these challenges, and ensure effective crisis and operations management, an integrated model of information sharing is required.

He elaborated on the components of information sharing and the phases of the comprehensive crisis and operations management process. Challenging traditional perspectives of networks that separate the social and technological components of information sharing, he provided an introduction to an innovative model that integrates these components: the I3I Model.



The I3I Model allows military and non-military organizations to better assess and improve information

sharing within and across their boundaries and ensure effective crisis and operations management. The usability of the model



was illustrated using the phases of the comprehensive crisis and operations management process.

The takeaways from this presentation:

1. Networks are sociomaterial entities that always constitute of a variety of components, but the relationship between these components is not effectively represented in the traditional perspectives.
2. Information sharing is caused by multiple components and an assessment or intervention that concentrates on one component at the expense of others is incomplete.
3. A sociomaterial perspective integrates the social, organizational, material, and technological components of information sharing and effectively represents the relationship between these components in networks.

Using the I3I model enables a complete assessment that concentrates on all components of information sharing and allows organizations to improve information sharing and ensure effective crisis and operations management.



Presentation by **LtCol Arjo JANSSEN (NLD A)**. He has been Chief of the Analysis and Concept Development Branch of the C2CoE since August 2010.

The new NATO Command Structure and NATO Force Structure



LTC Arjo Janssen briefed the audience on the NATO Command Structure (NCS) reform and on deployability within the NCS and the relation with the NATO Force Structure (NFS).

The 2010 Lisbon Summit committed NATO to transforming its operational-level headquarters, adopting a new Peacetime Establishment (PE) and re-configuring to be able to meet NATO's objectives from either static or deployed locations.

The new NCS consists of two Strategic Commands (Operations and Transformation) and two Joint Force Headquarters (JFHQs) - Naples and Brunssum. The NATO Level of Ambition (LOA) and political guidance directed that a model be developed that permits each of the two enduring JFHQs to be capable of establishing a deployed Joint Task Force Headquarters (JTF HQ) that is capable of the full C2 of a Major Joint Operation (MJO) for up to one year with 500 personnel.

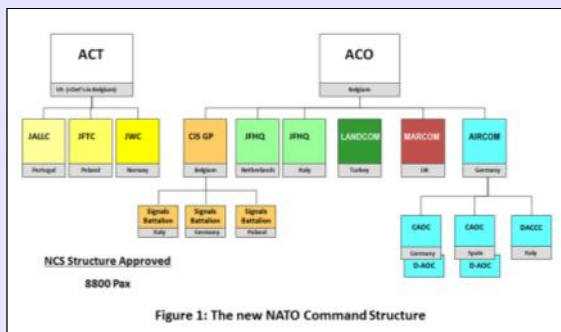


Figure 1: The new NATO Command Structure

The existing model for the deployment of a JFHQ relies upon a Deployable Joint Staff Element (DJSE) provided by a Force Command (Heidelberg and Madrid), which are due to disband in 2013.

The JTF HQ concept has its roots in MC 586, "MC Policy for Allied Forces and Their Use for Operations" and the "Bi-SC Conceptual Framework for Alliance Operations" (Bi-SC CFAO). The JTF HQ concept is based upon a stepped and scalable model that provides options for a progressive deployment of four building blocks (figure 2), each of which comprises operational functions that can be tailored to the mission and situation.

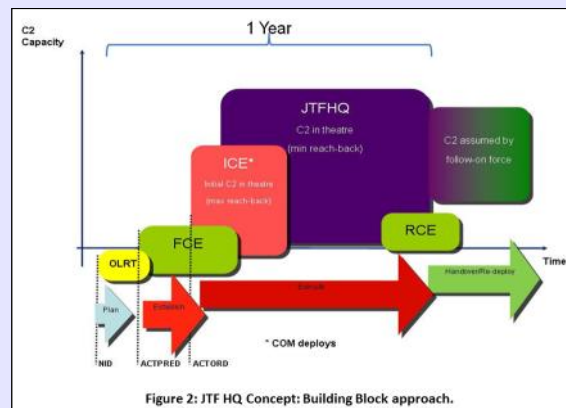


Figure 2: JTF HQ Concept: Building Block approach.

The building blocks comprise:

1. An Operational Liaison and Reconnaissance Team (OLRT), which supports and informs the planning process.
2. A Forward Coordination Element (FCE), which provides for early influence and in-theatre coordination prior to ACTORD.
3. An Initial Command Element (ICE), which establishes a mini-



mum footprint to conduct in-theatre C2 and,
 4. The JTF HQ which establishes full, and mission-tailored, C2 in theatre.

After a year, responsibility will be handed over from the JTF HQ from the NCS to a JTF HQ from either the NFS or Nations.

The Redeployment Coordination Element (RCE) is a sub-set of the JTF HQ and is not regarded as a separate building block. The RCE will coordinate the handover from

the JTF HQ to a Non-NATO HQ or other non-NATO entity including Host Nation. It will effectively terminate NATO's responsibility for the mission.

In May 2012, an interim version of the concept was released by SHAPE. This version was tested during STEADFAST JOIST, BOLD DRAGON and STEADFAST JUNCTURE. Based on the lessons identified, the JTF HQ concept will be finalized in 2013.

*"If you think of the Cold War as NATO 1.0, and our current operations as NATO 2.0, this new structure represents **NATO 3.0**: a new approach. This approach places emphasis on special operations, cyber, intelligence, surveillance, reconnaissance, strategic communications, missile defense, and a robust set of exercises and training events to keep the edge on the Alliance's deep military capability".*
Admiral James Stavridis, SACEUR

Presentation by **Col Slavomir STAVIARSKY (SVK A)**. He has been the chief of Strategic Planning Division at Strategic Planning and Capability Development Branch (J5), General Staff of the Slovak Armed Forces.

Slovak Armed Forces approach to the revision of Command and Control

The main purpose of Col Staviarsky's presentation was to give the seminar participants an insight in the approach used by the Slovak Armed Forces (SAF) to review their national C2-structure.

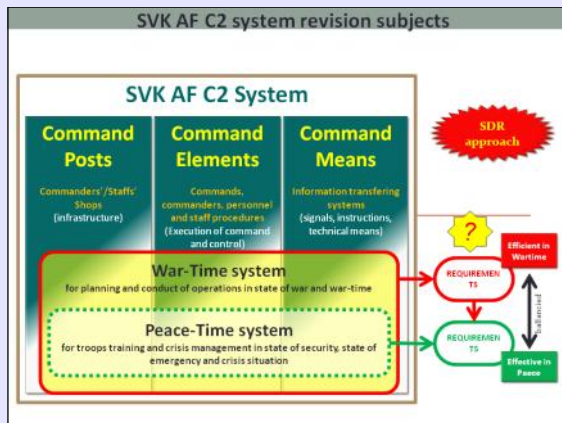
From the beginning Col Staviarsky stressed on the dual tracked ap-

proach of the revision of both the war (CE)- and the peace-time (PE) C2 structure of the SAF with an initial focus on the war-time C2 structure.



analysis and an analysis of a doctrinal approach to crisis C2 arrangements. Taking into account a revision of the C2 arrangements, of Force Goals (national Targets) and

that serves as a framework for the requirements development of a peace-time C2 system both on strategic and operational level. Those concepts were evaluated during a series of "Fresh Breeze" exercises (referring to the inauguration of a new government in 2012). Based on representative scenarios (SAF acting alone, within NATO or another coalition) the SVK General Staff (GS) fine-tuned the war-time model including minimum military requirements.

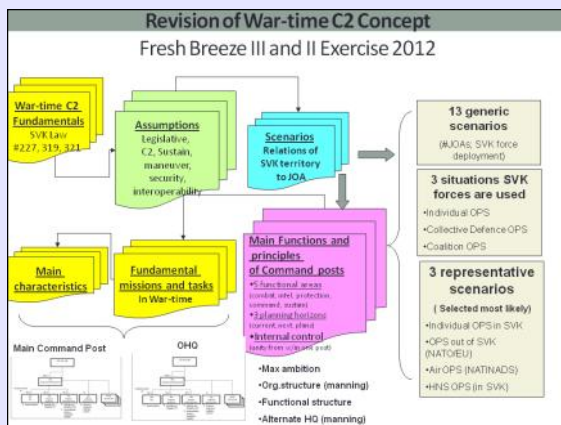


possible structures for their units, they came up with a fundamental "war-time" model for the armed forces representing MMR for full spectrum of SAF tasks that serves as a foundation for a peace-time end state in 2024 (projection phase). A lot of effort was put within this approach to determine future C2 capability requirements.

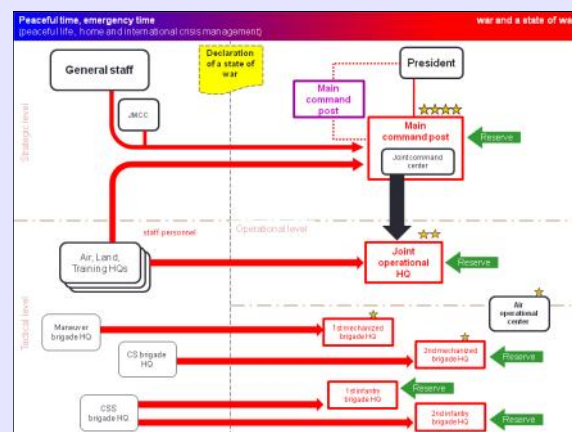
The second track involves the revision of the PE C2. Using the CE C2 model and a white paper, including the SVK CHOD's directive, the strategic planning branch started the SAF C2 PE optimization process. Going through different workshops, using SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and the methodology of Lean Six Sigma and executing several staff checks the SVK is continuing his effort to determine the future CE C2 model.

As stated in this introduction the main focus in the beginning was given to the revision of the doctrinal approach to SAF C2 systems in war-time. Not only did this stra-

There is still a lot of work to be done, but it is clear that the approach used by the SVK GS creates a solid foundation for a successful transition of their national PE and CE C2 structure.



tegic planning branch came up with a war-time C2 concept, but also with a Main Command Post concept



The Social event took place in the Restaurant „Vinum Galeria Bozen” in Pezinok. This non hosted dinner was opened by Director C2COE Colonel A.P.P. Visser. The participants had another chance to make contacts and have informal discussions with the speakers and each other.



Presentation by **LtCol Manuel GARCÍA ORTIZ (ESP MC)**. He is a member of Concepts & Capabilities Directorate, European Union Military Staff.



EU Approach to C2

In terms of security and defence the EU acts in ways that are poles apart from other military-dominated constructs such as NATO. The main goals of the briefing was to strip away some of the perceptions about the EU and its ability to deliver Comprehensive action, and to point up the EU specificities.

The bedrock of the EU's reinvigorated CA is the 2009 Lisbon Treaty and the creation of the High Representative of the Union for Foreign Affairs and Security policy. The EU now has the legal basis and institutional structure to ensure a coherent and comprehensive application of its various instruments. 75 percent of the EU members are also member of NATO.

The EU does NOT have a standing military C2 Structure. As a result, clear and effective C2 arrangements are needed to ensure the successful planning and conduct of operations. Unlike NATO the chain of command is extremely short.

How we do Comprehensive Approach in the European External Action Service (EEAS)/EU.

The EU Crisis Response System (CRS) is part of EU wider efforts to preserve peace, prevent conflicts and to strengthen international security and to help address man-made and natural disasters. This is an immediate ready system of advance planning and alert comprising standard decision making procedures to ensure that appropriate actions and proportional security measures are taken in response to a crisis or to the evaluated risk level. Good coordination is essential due to the many different civilian parties involved.

The High Representative's dual role as Vice President of the European Commission offers an important opportunity to facilitate increased coherence and synergies. Effective EEAS linkages and synergies must be ensured in particular with all EU short, medium and long-term instruments and actions that relate to conflict prevention and peace building.

During the EU Crisis Management Planning Process, coordination at political-strategic level, cooperation at strategic (OHQ) level and synchronization at operational level are essential for success.

EU is able to turn a comprehensive approach into comprehensive action with some real and growing impact on the ground.

Presentation by **Peter JONGEJAN**. He was an associate professor at the Netherlands Defence Academy (NLDA).

Social Media vs C2

Mr. Peter Jongejan provided a presentation on the current state of the art in using Social Media (SM) in C2. As an introduction Mr. Jongejan took us in the domain of functions and definitions of social media. Social media is based on peer-to-peer contact and it all comes down to participation and collaboration. Research has shown that if we look into the use of SM in civil life we often see that there is an overwhelmingly one-way traffic, no central control and organizations find assimilation difficult. Most probably this is the reason that communication with SM within a professional crisis management community is hardly available. Little information has been found in military C2 literature.

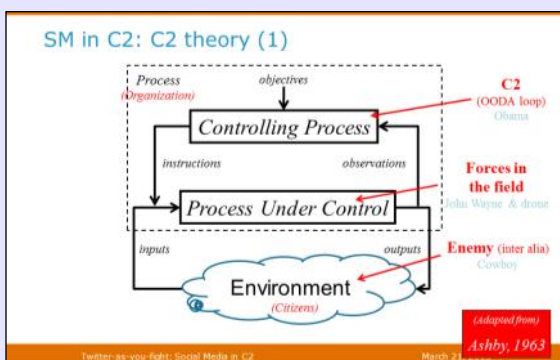
In the past 15 years we see an increase of influence of telecommunications network technologies. Under the NEC model, robust networking and collaboration leads to shared situational awareness, better decision making, and ultimately better mission effectiveness. A key consequence is that technology allows units to coordinate their actions with their

peers without first obtaining them from their commanders; this is known as self-synchronization. Mr. Jongejan described an



experiment to see the usage of SM in C2. As a starting point the cybernetic control theory (Ashby 1956) and extended Reuter et al (2011) framework was taken, where in the extended framework each organization is divided into a control process and a process under control. The aim of the experiment was to test whether or not the extended framework of Peter Jongejan & Professor Tim Grant (2012) could be implemented using SM. A positive outcome would be if implementation by media led to a faster, better, and/or cheaper response. Two experiments were executed; C2 with and without social media. Notable outcomes of the data collected during the experiments were:

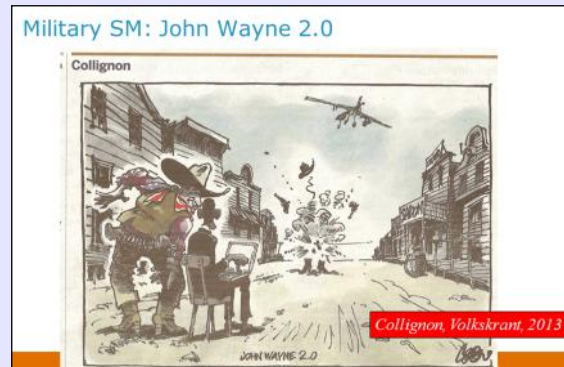
- There is value in using social media for C2 purposes, with the remark that social media systems would have to be secured.
- Social media allows recipients to read messages that were not specifically addressed to them.
 - ♦ positive; enabling self-synchronization
 - ♦ negative; information overload



- Short messaging demands the use of clear jargon.
- Use of right tools like 'CrowdMap' could provide users a better overview.

Despite its limitations, the prime contribution of the research has proven the principle expounded in Jongejan and Grant earlier paper (2012). The application of SM technology to close the control loop in an experiment can enhance self-synchronization between first responders, resulting in faster achievement of the mission. On this basis we can conclude that more research is necessary, and that this

result should stimulate other researchers to initiate more detailed and comprehensive concept development and experimentation (CD&E), which could possibly lead to operational applications of social media in C2.



Presentation by **Maj Christian BRACCINI (ITA A)**. He is Staff Officer at NATO Cooperative Cyber Defence Centre of Excellence (NATO CCD COE) in Tallinn, Estonia.

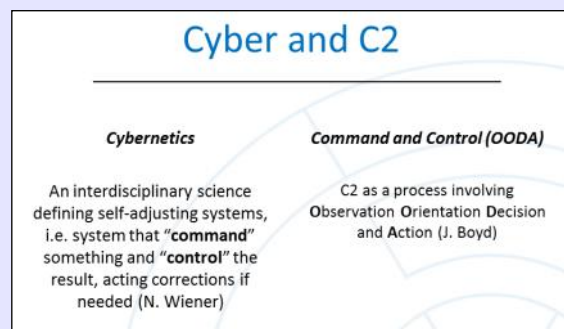


Cyber Security and C2

The benefits to an attacker to use cyber exploits are potentially spectacular. Should any State find itself in a full scale conflict with a peer adversary, attacks would be expected to include denial of service, data corruption, supply chain corruption, traitorous insiders, kinetics and related non-kinetic attacks at all altitude from underwater to space. Military commanders may rapidly lose trust in the information and the ability to control own systems and forces. The impact of a full scale cyber assault on the civilian population would be even greater with the power grid, com-

munications infrastructure, financial networks and fuel distribution infrastructures all getting crippled.

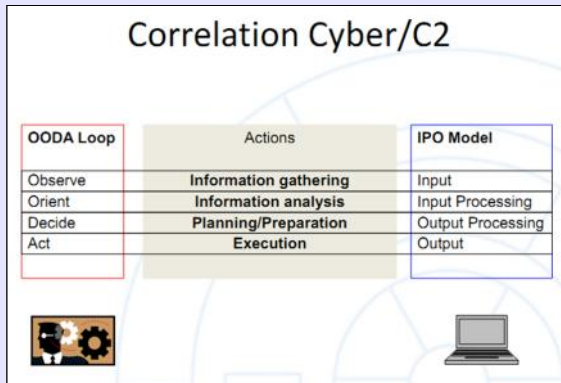
Much of the problems have to do with the relative lack of readiness of military networks and critical infrastructure networks to withstand a sustained cyberattack.



Maj Braccini presented the audience a briefing about Cyber Threat Picture, Cyber Security,



NATO Cyber Defence Policy and Cyber and C2. His briefing was conducted in a very enthusiastic and engaged way.



Cyberspace can be described as the 5th Domain. The Cyber Threat Picture represents Cyber Crime, Espionage, Terrorism, component of conventional warfare, conflict and Cyber war. He explained about botnets and their capacities as large networks of infected computers under central control with the ability to be a universal tool and 'weapon of the poor' as the equipment is already available. He gave many examples of use of botnet in the last years, Georgia 2008, Estonia 2007, Stuxnet 2009 and Operation Payback 2010 where the impact was causing huge problems for the attacked entities.

Characteristics and Challenges:

- Cyber offers great advantages, but also makes us dependent
- Rapid technological developments, time factor
- No state borders or organisational boundaries
- Different stakeholders: national/international, public/private, military/civilian
- The attacker has the advantage, time factor

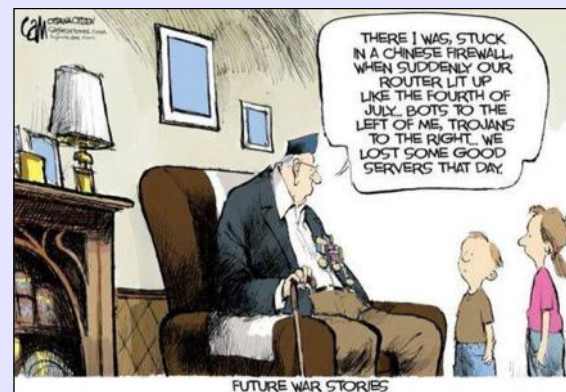
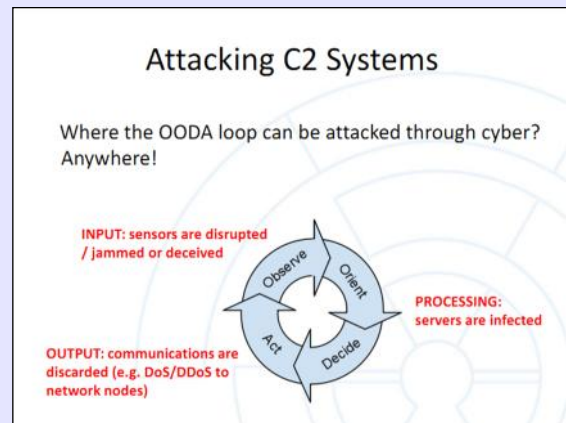
- Empowerment of the 'weak' – 'asymmetric warfare', hackers can have an impact on States
- Attribution problem(s) – who attacks you and who is responsible
- What is a 'cyber weapon', who is a combatant?

Regarding Cyber Security and NATO Cyber Defence Policy he covered the NATO definitions and talked about the background on the Lisbon Summit 2010 decision to develop a NATO Cyber Defence Policy.

In Cyber and C2 he showed the difference of models used in Cybernetics and C2 referring to the IPO Model and C2 OODA Loop (Observe, Orient, Decide, Act).

Conclusion

The OODA loop can be attacked through cyber – anywhere!



Presentation by **LtCol Soenke MARAHRENS (DEU AF)**. He is Commanding Officer, A Battalion, German Joint Signal School.



Future approaches and challenges to C2 / C2 Challenges & a Way Forward

Teaser

“International approaches and initiatives regarding Network Enabled Capabilities (as a synonym for NCW, NBD etc) matching exactly the “Gartner Hype Cycle”. By 2011 the “Plateau of Productivity” has been reached for Network related C2 efforts.”

The Western Nations have faced a paradigm shift from the 90s to 2010', from a balanced bipolar security architecture into a multi-polar globalized world. Until now NEC initiatives are mainly seen from a western military perspective, whereas the military always took ownership of “network forces” part inside the NEC hypothesis “Networked Forces outperform non networked forces”.

The presentation demonstrates that by using NEC lenses on events in Africa, the Middle East and India, the West (US and Europe but also Israel and Russia) has to accept that opponents are using NEC related features to break the symmetry of military operations or to foster asymmetric approaches in order to prevail in operations against conventional military or police forces.

Our opponent has already adopted through behavioural changes and new doctrine and

has gained self-synchronized operations with a higher speed of command accompanied by an increased combat power like it was predicted by the founders of the NCW theory challenging military and police forces.

Conclusion

LTC Marahrens proposes that in order to regain the initiative / symmetry western forces have to accept that (under the premise that “Network Forces outperform non networked forces”):

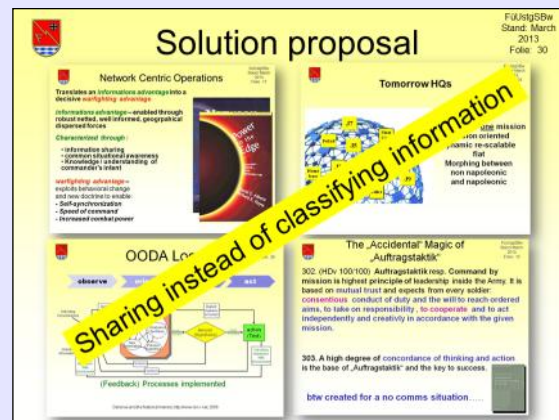
- a. The revival of the Clausewitzian approach of “War is a contest of will” and there for an issue of the cognitive domain and not just of the information or physical domain. The information age adds the social domain as the group dimension of the cognitive domain.
- b. The Napoleonic Staff construct was developed and optimized for a 1 on 1 force on force engagement.
- c. The Counter Insurgency problem space is complex not just complicated.
- d. Mission Command (German Auftragstaktik) is “accidentally” a NEC enabler; actually it could be better described as the perfect WEB 2.0 behaviour based on its social components like trust, information sharing and pro-activity features.
- e. The simple digitalization of forces does not create “better”



forces - quality is just gained through behavioural changes and new doctrine.

- f. Therefore future HQs must be designed for the actual mission, not in a generic manner, they should be led under a paradigm of "Auftragstaktik", they must be dynamic re-scalable in order to cope with the different workloads during the five mission phases - for example in a PRT the J9 is more important than the J3, where's in a brigade HQ it is the opposite. In order to prevent mission creep HQs hierarchies

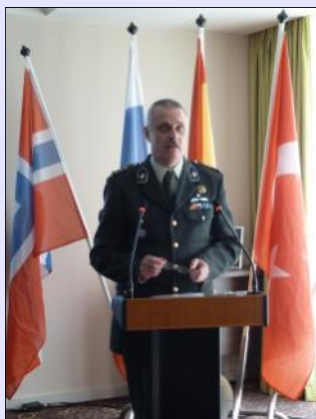
must be as flat as possible in order to morph between non-Napoleonic and Napoleonic methods of problem solving.



Closing remarks by Colonel A.P.P. VISSER (NLD A), Director C2COE.

Col Visser, brought some last "food for thoughts" on the table and thanked all the speakers and participants for their cooperation, active work, good contributions and the fruitful discussions. C2COE organized an interesting seminar with different approaches to the topic, inviting knowledgeable speakers and creating a positive atmosphere to enhance collaboration, teamwork and discussions. This also included some social highlights as all participants hopefully remember.

He expressed his hope that everybody found the seminar interesting, beneficial and established new contacts to widen participants' network and will in the future always stay in touch with the Command & Control Centre of Excellence. He wished them a safe trip back and also invited all participants and speakers to take part at next events in the future organized by C2COE such as seminars and workshops, all of which can be easily tracked down on C2COE website, www.c2coe.org.



Seminar Pictures



ANNEX A Seminar Programme

Tuesday 19 March 2013

ADMINISTRATION and INTRODUCTION

0830-0900	Arrival and in-processing	
0900-0915	Opening of Seminar	Colonel A.P.P VISSER, Director C2COE
0915-0930	Welcome Speech by SAF	BG Josef POKORNÝ, Ph.D., General Staff of the Slovak Armed Forces
0930-0945	Introduction to the Seminar	Moderator, LtCol Achim MUELLER, Dep. Dir. C2COE Capt Jaroslav DIDIK, C2COE
0945-1000	Participant Introduction	All
1000-1045	Keynote Speaker	BG Josef POKORNÝ, Ph.D. , General Staff of the Slovak Armed Forces
1045-1105	Break	
1105-1150	The Challenges of Command and Control	Philip S. E. FARRELL, Ph.D., Defence R&D Canada
1150-1330	Lunch	
1330-1415	Comprehensive Approach	LtCol Rob TRABUCCHI, NATO IMS
1415-1425	Break	
1425-1510	C2 in Complex Crises	LtCol Rob TRABUCCHI, NATO IMS
1510-1525	Break	
1525-1610	AMN - A practical implementation of a network enabled C2 environment	WG CDR Allen WILSON, SHAPE
1610-1625	Wrap up	Moderator, LtCol Achim MUELLER, Dep. Dir. C2COE
1900-2100	Icebreaker	

Wednesday 20 March 2013

0900-0945	NNEC and development of new criteria	Dr. Alberto DOMINGO, ACT/C2DS-THF Branch
0945-1000	Break	
1000-1045	Best Practices from NNEC assessments	Maj Steinar SVALSTAD, C2COE
1045-1100	Break	
1100-1145	Consultation C2 in recent NATO operations (OUP, ISAF, Ocean Shield)	LtCol Grady WALSTEIJN, C2COE
1145-1325	Lunch	
1325-1410	Information Sharing and Comprehensive Crisis and Operations Management	Mr. Gijs van den HEUVEL, SHAPE/CCOMC
1410-1425	Break	
1425-1510	The new NATO Command Structure (NCS) and NATO Force Structure (NFS)	LtCol Arjo JANSSEN, C2COE
1510-1525	Break	
1525-1610	SVK approach to Armed Forces C2 concept	Col Slavomir STAVIARSKY, GS SAF
1610-1625	Wrap up	Moderator, LtCol Achim MUELLER, Dep. Dir. C2COE
1900-2200	Non Hosted Dinner	C2COE

Thursday 21 March 2013

0900-0945	EU Approach to C2	LtCol ES MC Manuel GARCÍA ORTIZ, EUMS
0945-0955	Break	
0955-1040	Social Media vs C2	Peter JONGEJAN, NLDA
1040-1050	Break	
1050-1135	Cyber Security and C2	Maj Christian BRACCINI, CCD COE
1135-1250	Lunch	
1250-1335	Future approaches and challenges to C2 / C2 Challenges & a Way Forward	LtCol Soenke MARAHRENS, DEU Joint Signal School
1335-1350	Way Ahead	Colonel A.P.P. VISSER, Director C2COE

CONCLUSION

1350-1400	Closing of the Seminar	LtCol Achim MUELLER, Dep. Dir. C2COE
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ANNEX B List of Used Abbreviations

ACO	Allied Command Operations
ACT	Allied Command Transformation
AMN	Afghan Mission Network
C2	Command and Control
C2COE	Command and Control Centre of Excellence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CA	Comprehensive Approach
CCD COE	Cooperative Cyber Defence Centre of Excellence
CCOMC	Comprehensive Crisis and Operations Management Centre
CD&E	Concept Development and Experimentation
CFAO	Conceptual Framework for Alliance Operations
CFI	Connected Forces Initiative
CHOD	Chief of Defense
CIS	Communication and Information Systems
COI	Community of Interest
CRS	Crisis Response System
DEU	Germany
DJSE	Deployable Joint Staff Element
DHS	Document Handling System
DOTMLPFI	Doctrine, Organisation, Training, Materiel, Leadership, Personnel, Facilities, Interoperability
EEAS	European External Action Service
ESP MC	Spain Marine Corps
FCE	Forward Coordination Element
FMN	Future Mission Network
GS	General Staff
HQ	Headquarters
ICE	Initial Command Element
IJC	ISAF Joint Command
IHQ	ISAF Headquarters
IM	Information Management
IS	Information Sharing
ISAF	International Security Assistance Forces
ISR	Intelligence Surveillance and Reconnaissance
ITA	Italy
JALLC	Joint Analysis Lessons Learned Centre
JFC	Joint Forces Command
JFHQ	Joint Force Headquarter



JTF HQ	Joint Task Force Headquarters
LOA	Level of Ambition
LI	Lessons Identified
LL	Lessons Learned
MC	Military Committee
NATO	North Atlantic Treaty Organisation
NBD	Network Based Defence
NCS	NATO Command Structure
NCW	Network Centric Warfare
NEC	Network Enabled Capabilities
NFS	NATO Force Structure
MJO	Major Joint Operation
NLD	The Netherlands
NLDA	Netherlands Defence Academy
NML	NEC maturity level
NNEC	NATO Network Enabled Capabilities
NOR	Norway
NRF	NATO Response Force
OF3	Major
OF5	Colonel, Captain Navy
OLRT	Operational Liaison and Reconnaissance Team
OODA	Observe, Orient, Decide, Act
OOS	Operation Ocean Shield
OUP	Operation Unified Protector
PE	Peacetime Establishment
RAF	Royal Air Force
RCE	Redeployment Coordination Element
RNLAF	Royal Netherlands Air Force
SAF	Slovak Armed Forces
SAS	System, Analysis and Studies
SD	Smart Defense
SDR	Strategic Defence Review
SHAPE	Supreme Headquarters Allied Powers Europe
SM	Social Media
SN	Sponsoring Nations
SOA	Service Oriented Architecture
SSA	Shared Situational Awareness
SWOT	Strengths, Weaknesses, Opportunities, Threats
UK	United Kingdom
USA	United States of America



Command and Control Centre of Excellence



Catalysing the art of C2



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