

# NEC<sup>1</sup> DEVELOPMENT AND IMPLEMENTATION – SUPPORT OF THE EUROPEAN CAPABILITIES IN THE PRESENT SOCIAL AND POLITICAL CONTEXT

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## 1. Introduction

The world is undergoing a period of multi-dimensional fundamental transformation at an extraordinary speed. The changes rose in the security environment and in the physiognomy of waging the modern combat actions by introducing new technologies and systems, intelligent weapon platforms, advanced sensors and digitization of the modern combat space which represent a few elements which deeply changed the features of the 21<sup>st</sup> century military conflict.

Downsizing both military budgets and personnel, restructuring, reorganization, transformation, high-tech equipment, professionalization, new risks and threats emergence, increased share of the military operations other than war all drive to changing the concept of conducting military actions, the emergence of new doctrines and strategies, as well as to new approaches on the armed forces training.

The new types of conflicts are obviously different from the previous ones by the extended space of confrontation, asymmetric character, intense media coverage, growing importance of the information operations, and the focus on critical structures.

The purposes of the great powers, with special effects on the configuration and evolution of the present conflicts are the digitization of the modern combat space, the modeling and simulation of the combat actions, and winning the information and network warfare.

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<sup>1</sup> NEC – Network Enabled Capabilities

The most efficient collection, processing, production, distribution, and use of the information are to be achieved by ever wider implementation of the network working concepts. Military and civilian organizations should hold the permanent access and control of the information and information environment needed for the support and execution of the missions and tasks. Military and civilian leaders have to be able to timely synchronize and integrate operations in the modern operations space, worldwide. The global connectivity between the allied forces or inside the coalitions will be, in our opinion, a critical capability for the missions' success and a decisive advantage for mobility, optimal reaction time, and commitment in operations. Systems interoperability and information integration should be ensured in the operations space for the significant improvement of the efficiency of the civilian and military, multinational or joint operations and for the support of the commanding authorities.

## **2. Conceptual Delimitations and Doctrinal Determinations**

The developed countries maintained their position of military dominance worldwide, starting with the '90s, mainly due to the superior military technology. However, the last years have shown that this difference is shrinking as the price of this technology rapidly lowers and more and more countries invest massively in programs of military modernization. In the effort of maintaining the military advantage, the developed countries oriented not only toward the technological modernization of their military equipment, but also toward an intensive exploitation of new network and system concepts which should allow for a decisive improvement of the efficiency in the exploitation of their equipment. The United States of America became the leader in the direction of development with their new theory, i.e., Network Centric Warfare – NCW. The concept of Network Centric Warfare briefly describes the combination of emerging tactics, techniques and procedures that a networked force can employ to create a decisive warfighting advantage<sup>2</sup>.

If this concept is strictly related to the reality of the American military forces, its successor, NATO Network Enabled Capabilities (NNEC), extends the theory to the level of the whole North-Atlantic Alliance. NNEC is the Alliance's ability to federate various components of the operational environment, from the strategic level down to the tactical levels, through an integrated and unique networking and information infrastructure<sup>3</sup>.

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<sup>2</sup> Cf. Garstka, J.J., *Network Centric Warfare Offers Warfighting Advantage*, Signal Magazine, USA, May 2003.

<sup>3</sup> *NNEC Vision and Concept*, MCM-0032-2006, Allied Command Transformation, Norfolk, Virginia, USA, 2006, p.2.

The purpose of applying new concepts, such as Network Centric Warfare, and NATO Network Enabled Capabilities, in planning, organizing and conducting warfighting is the ability to provide all the leaders at all subordinated levels with the near real-time information needed to understand the tactical situation and to act according to the commander's intent. This enhanced commanding ability generates new operational challenges. While the subordinates have broader access to the tactical situation, the higher commanders gain access to very detailed tactical plans. The latter should resist the temptation to conduct minor military actions at subordinated levels since their intention could diminish the benefits of the modern information systems and the situational awareness they support. As a result, it is important to develop strong leaders at every level and to build on the assertion that confidence and cohesion of forces are based on complex, combined, C4ISR type equipment and systems materialized by realistic training, drills, and live exercises. From the European Union perspective, the NEC concept is defined as the ability to shape a cohesive action environment for a comprehensive approach and for a unified effort of civilian and military entities and actors at all levels in EU-led Crisis Management Operations and Missions through well-informed and timely decision-making and coherent execution, based on the seamless and efficient sharing and exploitation of information, by competent personnel, properly tailored processes, and developed networks.

NEC has the potential to thoroughly revolutionize warfighting. Nevertheless, a great part of the enthusiasm and prospects that NEC was credited with was concentrated on the technology necessary to turn NEC into reality. The efforts for developing the doctrine or procedures necessary to transform the NEC technology into the decisive advantage recommended by the concept have been inconsistent so far. The full military superiority on the battlefield will be ensured only by combining the new technology with a brand new doctrine specially designed to use the advantages offered by NEC. For NEC to reach its full potential, the doctrine should be developed on three distinct directions. First is to strike a balance in NEC between the mission command and the involvement of the direct commander in the tactical decisions. The second doctrinal direction to be developed is represented by decreasing the command vertical structures of the units in order to allow some smaller and more agile subgroups to cooperate into a synergistic whole. Finally, NEC imposes the development of a common language to be understood and utilized by all services to obtain accordingly situational awareness and self-synchronization of the actions.

NEC is based on the principle that the military should abandon the present way of conducting operations, centered around combat platforms, and focus on the networked leadership where all participants share all the available information for a

perfect situational awareness<sup>4</sup>. This increase of situational awareness and subsequent ability to react in a timelier manner than the opponent should give the military an exponential increase in ability without changing any of its platforms or weapons.

United States of America decidedly continued the NCW concept development and all the associated technological requirements. At present, the USA is developing the NCW concept into the Network Centric Operations (NCO) concept, defined as the exploitation of the human and technical networking of all elements of an appropriately trained joint force by fully integrating collective capabilities, awareness, knowledge, experience, and superior decision-making to achieve a high level of agility and effectiveness in dispersed, decentralized, dynamic, and uncertain environments<sup>5</sup>.

NCO and NEC programs are similar in most respects, but there are also differences. The most important difference is given by the scope and aspirations of the two projects. USA invested a great capital of trust and many efforts to develop NCO, and expect NCO to implement and govern almost every aspect of the military operations, with the networks in the core of the capabilities. The future NCO environment should have networks able to automatically filter huge amounts of data and to change missions' objectives and the use of forces and means according to a set of instructions provided by commanders and staffs. This vision practically excludes the human factor from the equation, leading to the fulfillment of many tasks through an automatic process. In contrast with NCO, NEC is perceived as a facilitator of the current operations, which will not reduce the necessary personnel or working hours, but will only ensure more secure and timely information to the commanders and operators for decision making.

At present, NEC is just a theory and will remain so until the technology and the doctrine will be fully developed to make the NEC functional. There are many signs that show us NEC will have the capacity to transcend or eliminate the barriers which exist between the tactical, operational and strategic levels of warfare<sup>6</sup>. This is due to the quality of NEC to disseminate information and situational awareness to all own participants in the theatre of operations. The strategic level will soon have the ability to oversee and influence every decision and action at the tactical level, and similarly, the so-called strategic corporal will be

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<sup>4</sup> Cf. John Owens, *NEC – How will it affect the philosophy of Mission Command in the future?*, Defence Research Paper, Shrivenham, UK, 2003, p.2.

<sup>5</sup> US Dept. Of Defense, *Net-Centric Environment: Joint Functional Concept, Version 0.95*, Washington D.C., 2004, p.1.

<sup>6</sup> Cf. D.Alberts, J.Garstka and F.Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority*, Washington D.C., 1999, p.82.

able to influence the strategic leadership of the campaign. As a result, the development of NEC should focus directly on the way it could be utilized to obtain decisive effects simultaneously at the tactical, strategic, political and military levels of warfare. The nature of NEC determines a special dependence on the degree of doctrine development to reach its full potential. The reason NEC will be so dependent on doctrine is related to the fact NEC promises to gather, in one single place, huge amounts of information from every sensor installed on the combat field. While the information superiority over an adversary could be translated into a decisional advantage, this situation also creates the possibility to overload and paralyze the system. For NEC to work, large amounts of information should be analyzed, filtered and integrated to have a product that will grant the decisional superiority. This activity largely depends on the human factor<sup>7</sup>, which can use the experience and the knowledge on that situation, as well as some types of procedural and doctrinal routines, meant to effectively execute the mission. Full operational capability of NEC will need the simultaneous development of cognitive and technological capabilities' areas. Technology cannot use all the information that could be generated by NEC by itself and, consequently, we consider the doctrine should be developed, in such a manner, to allow people to interface with the system in order to turn information into intelligence/useable knowledge.

### **3. European Military Capabilities**

The European Union Council approved on November 19<sup>th</sup>, 2007, the 2007 Progress Catalogue, that crowned the process launched as a result of the 2010 Headline Goal endorsement. The 2007 Progress Catalogue identifies, from the quantitative and qualitative points of view, the shortfalls in the military capabilities area based on the requirements established in the 2005 Requirements Catalogue and the commitments detailed in the 2007 Force Catalogue. This refines the potential implications for the military tasks to be executed during the crisis management operations.

The overall conclusion of the 2007 Progress Catalogue is that the European Union, with a view to 2010, has the capability to conduct the full spectrum of military European Security and Defence Policy (ESDP) operations within the parameters of the Strategic Planning Assumptions, with different levels of operational risk arising from the identified shortfalls. Some of these identified shortfalls are considered critical, namely the capabilities to transport forces to the theatre, to deploy them in theatre, to protect them and to acquire information.

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<sup>7</sup> Cf. John McColl, *Adapting Command Hierarchies: Does NEC Pose a Threat or an Opportunity?*, RUSI Journal 149/1, 2004, p.54.

Based on the initial conclusions of the 2007 Progress Catalogue, as well as on other studies on the possible operational and technological environment in the next 15 years, as well as member states' programs and lessons learned from recent and ongoing operations, the Steering Board of the European Defence Agency (EDA) wrote down the initial version of the Capability Development Plan (CDP) on July 8<sup>th</sup>, 2008. The Steering Board endorsed the CDP conclusions and started work on an initial list of 12 top priority capability areas. A new version of the CDP will be submitted to the EDA Steering Board at the end of 2010. The EDA, the member states, the EU Military Committee (EUMC), the EU Military Staff (EUMS) and the General Secretariat of the Council all cooperate in this task.

The first list comprised military capabilities from the following areas:

- Counter-Man Portable Air Defence Systems;
- Computer Network Operations;
- Mine Counter-Measures in littoral sea areas;
- Comprehensive Approach - military implications;
- Military Human Intelligence and Cultural / Language Training;
- Intelligence, Surveillance, Target Acquisition and Reconnaissance Architecture;
- Medical Support;
- Chemical, Biological, Radiological and Nuclear Defence;
- Third Party Logistic Support;
- Counter-Improvised Explosive Devices (C-IED);
- Increased availability of helicopters;
- Network Enabled Capability.

Because the topic of our study is centered on the NEC development and its implementation in the European Union, in what follows we will only analyze the evolution of this European capability, apart from the first set of military capabilities referred to in the initial version of the Capability Development Plan.

#### **4. NEC Development and Implementation in Support of the European Capabilities**

The European Defence Agency (EDA) was set up under a Joint Action of the EU Council of Ministers on July 12<sup>th</sup>, 2004, to support the Member States and the Council in their effort to improve European defence capabilities in the field of crisis management and to sustain the European Security and Defence Policy. The Long Term Vision Report published in October 2006 by EDA outlined that NEC should be a priority within the fundamental development of the European Security

and Defence Policy, under the growing need to provide civilian - military interoperability.

In order to win the information superiority, EDA decided on June, 28<sup>th</sup> 2008 to appoint the German General (ret.) Rainer Schuwirth to design a project for the European Union, regarding the NEC exploitation in support of the European crisis management operations. Before retirement, General Schuwirth held the position of Chief of Staff of the Supreme Headquarters Allied Powers Europe (SHAPE), and previously the position of General Director of the EU Military Staff (EUMS). General Schuwirth finished the project and the Council issued on September, 5<sup>th</sup> 2008 the document No. 12737/08, "The EU Concept for NEC in Support of the ESDP". The EU Military Committee analyzed the document from the military point of view and concluded:

- The main challenges for developing NEC in support of ESDP and the Comprehensive Approach have been identified;
- NEC development will address people and information issues, as well as network technologies;
- NEC development will be open to the participation of all Member States;
- There is a need for close co-operation with NATO, to explore the development of common NEC tools and processes, where appropriate, in order to avoid duplication of effort. All products from such co-operation should be made available to all Member States;
- There is a need for interoperability with NATO, when and where appropriate, without limiting a comprehensive ESDP approach to NEC;
- The successful implementation of the NEC Concept will require the full participation and determination of all EU entities and actors involved, including allocation of the necessary resources.

In December 2008, EDA selected the EURONEC consortium and together signed a contract for NEC Implementation Study. The latter started in January 2009 with a meeting attended by 80 experts from the participant member states, as well as from EU institutions and industry. This Study is planned to last for 18 months and to provide a comprehensive description of what NEC should bring in the future regarding its users, information and technology ("NEC Vision"), with the general aim to facilitate a joint effort of the civilian and military actors in the Crisis Management Operations of the ESDP. The Study proposes for the meantime a "NEC Roadmap" with clearly defined action and milestones (2012, 2018 and beyond 2025) for effective NEC implementation. The EURONEC Consortium brought together 6 European companies (i.e., BAE Systems, IST Ltd., EADS Deutschland GmbH, Indra Sistemas S.A., Selex Sistemi Integrati SPA, THALES

Communications SA and SAAB AB – the administrative leader of the project), which were already involved in some European NEC-related initiatives.

The NEC Implementation Study will have to meet over 200 recommendations or decisive conditions, out of which we consider the following to be the most relevant:

- Defining high level / lower level governance;
- Identifying Communities of Interest (CoI) and describing their roles;
- Defining an Information / Data Strategy;
- Establishing the legal framework for data sharing;
- Identifying and Defining Initial Core Services;
- Setting up federate communications through IP (Everything Over IP);
- Using Semantic Web technologies;
- Developing principles and guidelines for the Network Enabled attribute of capabilities;
- Developing assessment criteria and methodology;
- Using EU Distributed Test & Evaluation Laboratories;
- Disseminating findings through demonstrations / conferences;
- Using pilot case technique and practical implementation (Network Enabled Strategic Air Transportation).

We consider that, under the long lasting effects of the economic crisis in the European Union, the effective implementation of the NEC concept in the European civilian and military structures of crisis management will be significantly delayed. The implementation of the new technology in the military forces designated to the European Union battlegroups by the member states is unlikely in near future, since the defence budgets of the armed forces were notably downsized in all the European countries. Furthermore, we believe that in the present social and political context, the relatively reduced scale of Crisis Management Operations conducted by the European Union so far, does not justify spending important financial funds to allow the achievement of the synergies between civilian and military actors on the theatres of operations.

## **5. Conclusions**

The European Union NEC concept describes a complex approach designed for a more efficient command and control, as well as a superior information management in the EU Crisis Management Operations. This is a concept that envisages the development of a broader EU program of transforming the way information is gathered, managed and shared during such a type of operations. It is



expected that by 2025 the civilian and military EU entities will have learned the entire culture of cooperation established by the full use of the EU NEC collaborative possibilities. NEC concept meets the EU Vision of having a civilian and military capability to support the creation of synergies between the civilian and military committed to the Crisis Management Operations. NEC will demand the ability of working together in different forms: integration, cooperation, collaboration, coordination, etc. and will provide the auspicious environment to work with information.

In our opinion, the only way Europe could find the maturity to remain economically strong and globally competitive in the next 15 years is to promote the digital enabled society, at all collaborative levels, so that Europe could preserve its status of valuable partner and leader in the technology field for the rest of the world.



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