

# NATO Sfp 982063 FINAL REPORT

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## **MANAGEMENT OF SECURITY RELATED R&D IN SUPPORT OF DEFENCE INDUSTRIAL TRANSFORMATION Sfp 982063**

**FINAL REPORT  
October 2006 – December 2009**

Project co-directors

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Securing our Future  
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FINAL REPORT  
MANAGEMENT OF SECURITY RELATED R&D IN SUPPORT  
OF DEFENCE INDUSTRIAL TRANSFORMATION  
SfP 982063

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## 1. List of Abbreviations

ACT	– Allied Command Transformation
BAS	– Bulgarian Academy of Sciences
C2	– Command and Control
C4	– Command, Control, Communications, and Computers
C4ISR	– Command, Control, Communications, Computers, Intel- ligence, Surveillance and Reconnaissance
CoE	– Centre of Excellence
DNRS	– Department of National and Regional Security
EDA	– European Defence Agency
EUS	– European University (Skopje)
EVO	– Enabling Virtual Organizations
FYROM <sup>1</sup>	– Former Yugoslav Republic of Macedonia
ICAF	– Industrial College of the Armed Forces
IPP	– Institute for Parallel Processing (Bulgaria)
ITIS	– Institut für Technik Intelligenter Systeme e.V. (Germany)
MAS	– Military Agency for Standardization
M&S	– Modelling and Simulation
MoD	– Ministry of Defence
MoI	– Ministry of Interior
NADC	– NATO Armament Directors Conference
NAMSA	– NATO Maintenance and Supply Agency
NATO	– North Atlantic Treaty Organization
NfSC	– Network for Scientific Cooperation
NMCRL	– NATO Master Catalogue of Reference for Logistics
NPD	– NATO country Project Director
PPD	– Partner country Project Director
PPP	– Purchasing Power Parity
R&DCM	– Research and Development Concept and Model
NDC	– National Defence College (Romania)
SfP	– Science for Peace and Security Programme
UNWE	– University of National and World Economy (Bulgaria)

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<sup>1</sup> Turkey recognizes Macedonia with its constitutional name

## **2. Project Directors, Co-Directors and End-users**

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**The following organizations informally  
declared commitment to the project:**

### ***Romania***

- The Romanian Business Association of the Military Technique Manufacturers
- The Romanian Ministry of National Defence, Department for Armaments
- The Romanian Military Equipment and Technologies Research Agency

### ***Former Yugoslav Republic of Macedonia, FYROM<sup>2</sup>***

- The Ministry of National Defence
- The Ministry of Economics

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<sup>2</sup> Turkey recognizes Macedonia with its constitutional name

### 3. Summary

- All project objectives were timely and fully met: (1) Formulation of an R&D concept and model, **R&DCM**, (2) Development of a joint **Policy Framework** for coordinating R&D policy, (3) Creation of a Network for Scientific Cooperation, **NfSC**, and a **database**, (4) Establishment and operation of a Centre of Excellence, **CoE**.
- The academic achievements for young researchers with stipends are: 2 habilitatons, 8 defended doctoral dissertations, 8 Masters of Science, 13 Bachelors.
- In the course of this project the visibility of NATO was strengthened by media coverage of 5 international conferences, 6 (of 7) book publications in NATO – SPS format, presentations in universities, colleges, policy planning and business institutions, other national and international conferences and by many office calls.
- The project funding with 182.000 EURO, in which stipends for students played a very prominent role, was fully made use of, and the national contributions by partners were significantly higher than planned.
- Careers during the project:
  1. Mr. Iulian Fota, Co-director Romania, became State Secretary at the Presidency of Romania and National Security Advisor.
  2. Professor Dr. Tilcho Ivanov, PPD, became advisor to the MOD and the Ministry of Interior and lecturer at the Free University of Varna.
  3. Professor Dr. Zoran Ivanovski, Co-director FYROM<sup>3</sup> became Rector of the European University Skopje (EUS).

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<sup>3</sup> Turkey recognizes Macedonia with its constitutional name

4. Lieutenant-Colonel Adrian Morariu, Romanian team, became Director of the Romanian Government Construction Oversight Agency, Bucharest.
5. Aleksandra Stankovska, Macedonian team, graduated PhD and became Assistant Professor, Faculty of Economics, EUS.
6. Lieutenant-Colonel Assoc. Professor Dr. Doina Muresan, Deputy Director of the National Defence College of Romania was promoted to Colonel.
7. Assoc. Professor Dr. Elena Lacatus became Romanian member in the evaluation team of EU – FP-7 projects.
8. Assoc. Professor Dr. Dimitar Dimitrov, Bulgaria, succeeded Prof. Dr. Ivanov as Head of Department National and Regional Security (DNRS) at UNWE.
9. Professors Stefan Hristov and Georgi Pavlov acquired full professorates after their habilitation.
10. After their graduations a number of participants advanced to R&D related ministerial functions.

#### **4. Introduction**

As NATO member nations Bulgaria and Romania have to transform their defence posture in order to cope with the new threats and achieve interoperability – in the long run, at least partially, even communality – of their equipment, platforms and periphery, with the other NATO partners. Skopje intends to follow suit in order to prepare for NATO membership.

Initially platforms and equipment delivered from other NATO partners may have to be maintained and serviced. This also requires transfer of knowledge and technology. Thereafter co-production may be intended for special items or parts. In this context full responsibility could be assumed for specialized sectors of shared projects. For this process the local cost advantage for skilled labour may play

a pivotal role. In this context, guaranties concerning quality and timeliness of deliveries will be essential. For all these purposes the actually fragmented and dispersed R&D knowledge, skills and capabilities have to be identified, coordinated, transformed and integrated.

The project is aimed at satisfying a number of economic and social needs of the security sector transformation.

Integration of national defence industries into the NATO Defence Industrial Base is a vital challenge for the national roles in the context of common security concepts. The issue needs comparative analyses, assessment and study of the key factors for the present status and future modernization of the national defence industrial productive capacity. In addition, the defence industry transition process differs from the strategic framework of the defence transformation. The specific objective of the transformation needs specific expert knowledge. Lack of expertise hinders the discussion and public acceptance of this topic. There is a strong need for conceptual analyses, information exchange and scientific assessment of suitable models for defence industrial transformation.

The main objective of the project was to study and give practical recommendations for the transformation of security and defence related R&D management into a more comprehensive and integrated defence industry system in support of new network enabled capabilities needed in the fight against terrorism and new security threats. Thus a new Concept and Model for defence R&D management was elaborated to serve as an integrator of National Defence and defence industries. Its purpose is to help the transformation and internationalization of presently fragmented and nationally oriented defence industries and as a side effect to solve challenging social problems stemming from defence industry crisis. The national and regional defence industries are isolated and a new level of regional cooperation as well as wider international cooperation is needed.

The R&D superiority in the sphere of innovative technology and intellectual property is an important assets of the Defence Industry. The management and further improvement of these two spheres

is an inevitable prerequisites for future success. The management of R&D activities is comprehensive and has to be steered within a strategic framework which is based on national security needs and economic prospects. Ad-hoc employment state support has to be reoriented toward a strategy for support and the development of specific R&D advantages.

One strong practical result of the project is the R&D Concept and Model, R&DCM. The Model explicitly shows the specific relative advantages from which the Defence Industry can benefit and/or the scientific areas which have to be developed and supported to fill the gap between the current level of capabilities and politically adopted concepts. Therefore the setting-up of requirements for new R&D activities in the participating nations has to be based on the respective national capabilities, assessment and will to improve the relations between the national administrations and businesses.

As NATO member countries Bulgaria and Romania need a NATO-compatible Defence R&D Concept and Model which can play a basic role for development and further improvement of areas such as management of setting-up requirements for the Defence Industry and Joint Projects as well as Military Codification and NATO Standardization. Other nations in the SEE region may wish to follow suit.

The project results are intended to significantly improve cooperation and interdependence in advanced technology sectors. This will improve regional security and participating countries governmental and industrial policies.

The project's effort has both scientific and practical results. The scientific result, from the R&DCM, is a major contribution to the Partner Countries. The end-users are enabled to improve the use of their very limited resources for Defence Industry transformation. The project contributed to the cooperation within and between Bulgarian, Romanian, and Macedonian Defence Industries in R&D. It will enhance their capabilities and contribution both within the NATO Defence Industrial Base and the SEE as well as within the Black Sea Region. In addition, bringing together academics, ad-

ministrators and practitioners and their collaborative work will enhance the confidence and the common understanding of the topic among countries of the Balkan Region in the very sensitive matters of Arms Control, Arms Trade and Arms Production.

The successful transformation and coordination of the participating nations' defence industries and security related R&D – which was supported by this project and is intended to lead to negotiated definitions of areas of further national specialization – will give essential impulses for cooperation, modernization and specialization of their defence industries and R&D. It strengthens their already good political relationship and lead to better politico-military-industrial coordination and interdependence. Its function is to improve their defence industrial bases and the prospects for future NATO-interoperable defence postures as well as increasingly more reliable regional military stability and security as a whole. In addition, this NATO project brought together relevant specialized personnel and built a network of academics, industry and business managers and political decision makers, who will continue this cooperation also after the expiration of this project.

This way the results of the project contribute to improvements of the situation concerning R&D as well as the defence industry as a whole of the involved countries, where there had been no concepts and/or models which could describe the links of transitional countries' Defence Industries to other branches of their economy or to requirements of their armed forces and strategic defence management systems. The project results will increasingly focus the attention to the existing underestimation of the management of R&D activities and will promote further examination of the potential positive effects from politically adopted concepts for R&D support of Defence Industrial transformation.

## **5. Scope and Objectives of the Project**

This chapter contains a summary of the objectives achieved within the duration of the Project:

- scientific goals
- participation by other national institutions/industries
- training
- enhancement of scientific infrastructure
- international co-operation

**Main objectives** of the project:

**5.1.** To develop a NATO integrated R&D Concept and Model, **R&DCM**, as an incremental tool for the improvement of the (respective) national R&D management system, which includes the following tasks:

- To develop a methodology for further scientific analysis and research on the topic
- To explore best practices and regulations of NATO and developed countries
- To explore Defence Industry Transformation processes in Bulgaria, Romania and FYROM/Macedonia
- To formulate a Concept for Management of Security Related R&D in Support of Defence Industrial Transformation
- To generate a Model for Management of Security Related R&D in Support of Defence Industrial Transformation
- To standardize continually information available in conformity NATO AC/135 in order to integrate assets and capabilities into the NATO Master Catalogue of References for Logistics (NMCRL).

**5.2.** To develop and strengthen the common **policy framework** of internationally coordinated R&D policy in the defence industry sector as a prerequisite for steady economic growth and effective security. The policy framework has been discussed multinationally in order to be adopted politically. It contributes to stable relationships between the respective Armed Forces and Defence Industries. It needs and stimulates coordination of operational requirements

and defence industrial capabilities as well as the capacity of R&D management as an instrument for re-engineering their balance.

**5.3.** To elaborate a Defence R&D Management Network for Scientific Cooperation, **NfSC**, in the South East European (SEE) region. Such a network has to facilitate the development of further international agreements, regulations, contracts, and partnership within the Atlantic Alliance and the framework of already existing international organizations and forums. It promotes cooperation and specialization, helps to assess and exploit potential synergies and special skills as well as to prevent illegal development, production and export of armament.

The process of knowledge sharing throughout the NfSC as well as the studies based on the Model R&DCM was supported by establishing a database with appropriate structure and procedures.

**5.4.** To establish a Centre of Excellence, **CoE**, for training and educating practitioners and young researchers of the participating nations in the use of modern methods, practices and tools in the sphere of R&D management in support of the Defence Industrial Sector transformation by means of information/information exchange, seminars, training, modern IT and distance education. The CoE at UNWE is now well equipped for video-conferences and distance teaching/learning. It served for several training weeks with lectures and questions-and-answers periods for multinational audiences in Bucharest, Sofia, Skopje and Munich.

## **6. Realization of the Project**

Organization and management of the project, structures and activities are described in a table form [see **Annex 1**].

Substantial participation of young scientists has been essential, despite the difficulty of finding qualified young people devoted to this area.

Participating organizations have made specific contributions to the project in order to analyze, compare, integrate, educate, and direct their research work to the managerial problem of Defence Industry

transformation. DNRS – UNWE as a leading organization focused on the development of a NATO integrated R&D Concept and Model (R&DCM) and a related policy framework; on the establishment of the Center of Excellence (CoE); and on the issue training of trainers.

These activities were closely supported by IPP-BAS with the process of knowledge sharing throughout the development of the NfSC. The studies focused on the R&DC Model have been accompanied and supported by establishing a database with appropriate structure and procedures. Specialized software and software development has been also implemented.

ITIS, Munich, Germany coordinated and facilitated links with NATO and NATO countries in very close cooperation not only with the Program office, but also with other NATO structures. It facilitated scientific and organizational evolution of the participating nations' teams and provided needed assistance and advice for the establishment of the Centre of Excellence.

Management of the project was organized through the network of NPD, PPD and three co-directors with the following main responsibilities:

- Planning, overall coordination and finances: Dipl.Pol. Heinrich Buch, ITIS, NPD.
- Academic and organizational management of overall project: Prof. Tilcho Ivanov, DNRS – UNWE, PPD, who has been supported by Assoc. Prof. Dr. Dimitar Dimitrov.
- Research, national analyses, contributions, coordination, cooperation and integration: Co-directors State Secretary Iulian Fota, Prof. Dr. Zoran Ivanovski and Prof. Dr. Stoyan Markov.

Additionally the following leading experts were appointed for the coordination of the project objectives:

- Objective 1, R&DCM: PPD and Co-directors, Coordinator – Assoc. Prof. Dr. Tzvetan Tzvetkov, DNRS – UNWE

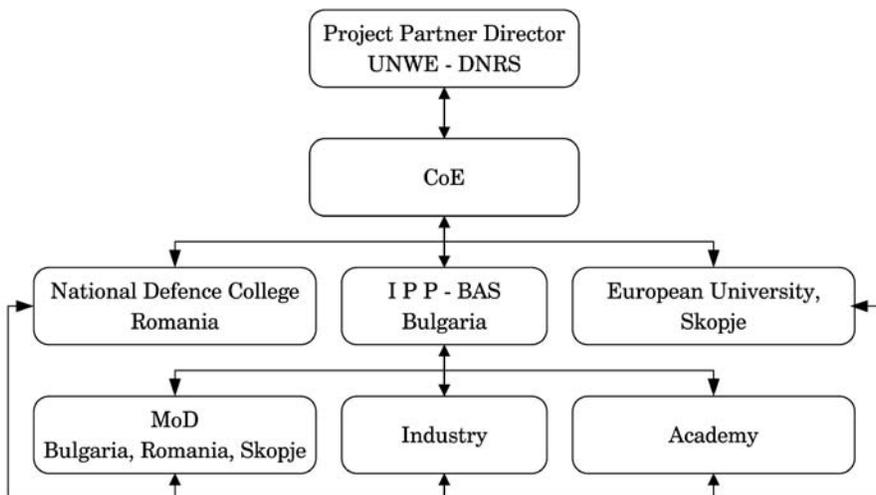
- Objective 2, Common Policy Framework: PPD/NPD and Co-directors, Coordinator – Assoc. Prof. Dr. Dimitar Dimitrov, DNRS – UNWE
- Objective 3, NfSC and database: Co-directors and PPD, Coordinator – Assoc. Prof. Dr. Georgi Pavlov, DNRS-UNWE
- Objective 4, CoE: PPD and Co-directors, Coordinator – Assoc. Prof. Dr. Stefan Hristov, DNRS – UNWE.

External coordinative functions were divided between:

- Coordination with end-users (MoD/ Industry): Co-Directors and NPD
- Application of results / International administrative and scientific coordination: PPD and Co-Directors.

For the detailed control of the carrying out of the project an MS-project plan was created. This plan was updated as a control and monitoring device while the project was being carried out. It was adjusted and updated on a regular basis and provided the basis for the periodic reviews and reporting.

The Organization and Management chart is given on Fig. 1.



*Fig. 1 The overview of the overall managerial organization of the Project (institutions, project teams and their interaction).*

The harmonized management of Project 982063 offered not only the proper framework for accomplishing the scheduled tasks and deliverables for each and every work package, but it also provided valuable references for the future activities of the Center of Excellence founded, equipped and functionally opened with this NATO SfP Project's support.

Another valuable outcome of the Project, having almost the same weight as the CoE and being an essential asset of the NATO SfP Program as well as for the future activities of the CoE, is the relationships' network. In a limited time frame (just three years) the nucleus of the four participant countries (BG-DE-RO-FYROM) spread globally through international conferences, study and documentation visits, interviews and training sessions coming together with representatives from defence, civil industries and academics (Belgium, United States of America, Germany, Croatia, Israel, etc).

## **7. Scientific Results**

The scientific results are reported here in the nature of a survey including conferences, published articles in scientific periodicals and presentations at scientific conferences. As a consequence, this report is relatively detailed and had to be organised per sub-project. Special attention should be given to the need for further regional coordination and increases in R&D activities after conclusion of the Project.

### **7.1. Objective 1: R&D Concept and Model, R&DCM.**

*Coordinator:*

*Associate Professor Dr. Tsvetan Tsvetkov, DNRS (UNWE).*

Three teams worked on achieving a NATO integrated R&DCM: (1) Bulgaria – Department for National and Regional Security (DNRS) at UNWE, (2) National Defence College (NDC), Ministry of Defence, Romania and (3) Faculty of Social Science, European University Skopje, Macedonia.

**The following scientific results were achieved in this segment of the project:**

**7.1.1.** Preparation and carrying out a kick-off meeting. A detailed plan for achieving Objective 1 was worked out. All members of DNRS and the young scientists in the Project worked out and discussed the research methodology. During the first year the team was working on analyses and finalized one of the deliverables “Comparative Observation of developed countries regulations and Practices”. Seven countries in and out of NATO were addressed – US, UK, France, Germany, The Netherlands, Italy, and Israel. Their experiences and good practices were explored in order to be used for the development of a NATO compatible Concept and model for the improvement of the national R&D management system. The information concerning requirements and restrictions of financing and carrying out scientific research in NATO and EU was systematized.

**7.1.2.** Activity 1.3: Bulgarian, Romanian and Macedonian defence industry transformation exploration was finished during the second six-month period of the Project, as was activity 1.4: “Concept Development”. The last draft was sent to several Bulgarian institutions for comments and recommendations – MoD, General Staff, Ministry of Economy and Energy, Ministry of Education and Science.

**7.1.3.** Activity 1.5: Model development and demonstration was finalized. An important place in this stage of the project took the “Preparation and implementation of the Students’ Scientific Conference on Concepts, models and policies for R&D management in support of Defence” (28 March 2008, UNWE, Sofia). Several reports presented on the Conference dealt with different aspects of a NATO integrated R&D Concept and Model.

**7.1.4.** Preparation and implementation of the International Conference on “Security and Defence R&D Management: Policy, Concepts and Models”, 29-31 May 2008, Varna. Some of the reports presented on the Conference were focused on different aspects of a NATO integrated R&D Concept and Model. The Coordination Meeting of the

project on 31 May 2008 approved the elaborated “R&D Model in Defence and Security”.

**7.1.5.** In September and October 2008 activity 1.6. was carried out – “Final improvements of the model and demonstration”. The views and opinions of experts familiar with the latest draft of the concept and model were compiled and analyzed and the results of the discussions were summarized in the conduct of training. Opinions and results were integrated into the concept and the model. Their final versions were elaborated and presentations for the demonstration of the concept and model were developed. The project had meanwhile gained visibility, particularly the activities at UNWE, where the demonstration of the R&DCM took place.

With these activities and results the quantifiable indicators concerning the “success criteria” for objective 1 of the project were fulfilled.

## **7.2. Objective 2: Common Policy Framework,**

*Coordinator:*

*Assoc. Prof. Dr. Dimitar Dimitrov, DNRS (UNWE)*

After developing the research methodology for Objective 2 several case studies were performed by the participants of the project. Every participating country studied and analyzed its own practice concerning R&D policy in security and defence and made comparative conclusive statements about the findings, especially the identified shortages in the area. The studies were distributed among the partners and served as a basis for the next stage of the research. The second milestone – Comparative observations of the regulations and practices in Bulgaria, Romania and Macedonia – was completed and the results were presented at the international project conference in Varna in May 2008. As part of the elaboration of the NATO compatible security related R&D Policy Framework 3 documents on R&D policy in NATO, EU and EDA were developed by the partners. Several reports devoted to the Policy framework were also presented in Varna.

Young researchers Nayden Ganchev and Ekaterina Bogomilova presented their reports on the R&D Policy at the Students' Conference, organized by UNWE on 28 March 2008 with participation of end-users and representatives of the defence industry. In the preparation of the Comparative Observations several young scientists participating in the project were involved: PhD students Konstantin Poudin, Georgi Penchev, Nikolay Stavrev, Noncho Dimitrov, as well as bachelor students Ekaterina Bogomilova and Nayden Ganchev.

### **7.3. Objective 3: Network for Scientific Co-operation, NfSC**

*Coordinator:*

*Assoc. Prof. Dr. Georgy Pavlov, DNRS (UNWE)*

As initially planned, the established SfP-982063 Scientific Co-operation Network consisted of three main areas – the web presence, collaboration and database. The three areas support and connect all project objectives and activities. The database supports the research activities on defence industrial transformation and the videoconferencing system. It contributes to communications and collaboration in research activities as well as on-line teaching and courses.

#### **7.3.1. The Web-space – SfP-982063 Web**

**Site <http://sfp.e-dnrs.org>**

The project site was set-up and promoted at the beginning of 2008. After the initial study and tests the project team chose Joomla! as a software platform. It is a popular open source software with a large community of developers and it allows easy access for users and content management by the project staff. The site is hosted on the project web-server together with the CoE web-site. The project web-server also hosts the groupware site and mailing services.

Since 2008 the project web-site was visited more than 40,000 times – or it had about 60 visits every day – an excellent result for a scientific project site.



### 7.3.2. Communication and Collaboration

The communication and collaboration tools introduced during the project consist of groupware, mailing lists and the videoconferencing system.

The first attempt to introduce the project groupware and mailing list was to set-up a project-specific groupware and mail services. The dotProject was chosen as a software platform for the groupware and Send mail and MMLJM were installed as a mail server and mailing list software. The solution was not very successful, because the project partners preferred more centralized project communications and the hard day-to-day support for the specific mailing software was not helpful in this situation. Thus, the project team took decision to use a more common solution. The project team now uses the Google Apps – Google communication, mailing and groupware platform. In 2009 the project team received and applied the free of charge Educational License for Google Apps.

EVO (Enabling Virtual Organisation) was chosen as the videoconferencing system for 7<sup>th</sup> project. It is scalable and can be used from

a single desktop to a big conference room. It is very easy to use in every set-up and the hardware solutions are affordable. EVO is a scientific and research world-wide network, supported and developed by Caltech, CERN and many other organisations, providing free videoconferencing services for academic use. Encryption is possible and was used. The videoconferencing system was established within the CoE in harmony with its objectives for research, education and collaboration. Two CoE rooms were equipped with videoconferencing capabilities – the Videoconferencing Room and the Training Room.



*System testing at the CoE's Videoconferencing Room*

The videoconferencing capabilities and solutions were successfully used during the first SfP-982063 Academic International Training Course with participants from Bulgaria (UNWE and IPP-BAS), Romania (NDC), the Former Yugoslav Republic of Macedonia<sup>4</sup> (EUS) and Germany (ITIS at Munich).

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<sup>4</sup> Turkey recognizes Macedonia with its constitutional name

### **7.3.3. The Project Database**

The development of the project Database started in 2008 with a logical structure and procedures research. The research results were discussed and approved by all project partner organisations and by the project end-users. After the approval and the study of the physical database structure, the appropriate software/hardware was purchased. The database was installed on the database project server with access to the web interface with front-end and administrator back-end, which has capabilities for user management. The user management was required in order to give permissions to the project end-users' organisations to enter in and to use data and information from the Database. The Database structure consists of vast specification related to Defence Industry enterprises, trade organisations and specific research projects.

### **7.4. Objective 4: Centre of Excellence (CoE)**

*Coordinator:*

*Professor Dr. Stefan Hristov, DNRS (UNWE)*

One of the main tasks and achievements of the project was the establishment of a Centre of Excellence (CoE) for training and education of practitioners and young researchers from the participating nations in the use of modern methods, practices and tools in the sphere of R&D management in support of the Defence Industrial Sector transformation by means of information exchange, seminars, training, modern IT and distance education. An additional objective was to integrate the efforts of the project's scientists and researchers.

Practical realization of the goals and the tasks of the Centre of Excellence was accomplished under the guidance of Prof. Tilcho Ivanov, PPD UNWE, and Assoc. Prof. Dimitar Dimitrov, Head of Department "National and Regional Security" at UNWE. Dr. Georgi Penchev and Dr. Konstantin Poudin took very active participation in the process of CoE setting-up as well as PhD students Yuri Tsenkov, Nedko Tagarev and several bachelor students from the special study sector "Security and Defence Economics" at UNWE.

In order to prepare a functional CoE web-site, some preliminary research work had to be done, including study of similar web sites and CoE practices with active participation of Master Degree students – Milen Georgiev, Nedko Tagarev, Todor Todorova, Teodora Vladimirova, Sofia Petseva, Petrana Vidolova, Iliana Ilieva, Ilinka Chervenкова, Rositsa Borisova, Tsvetelina Damianova, Milena Sasheva and others.

The website was developed by Dr. Georgi Penchev with the participation of Elitsa Pavlova and Nikolay Tenev. The popular personal publishing platform Wordpress was used, which provides the keeping of Web standards and a high level of flexibility together with suitable user interface and security.

## **7.5. Conferences**

The CoE at UNWE prepared three international conferences in Sofia and one in Varna (Bulgaria), and the NDC of Romania, one high level international conference in Bucharest, all with the participation of scientists from Germany, Bulgaria, Romania, FYROM<sup>5</sup>, Poland, and Croatia, The Netherlands, United Kingdom, United States and other countries. The conferences in Bulgaria were organized by the Department “National and Regional Security” (DNRS), University of National and World Economy (UNWE), Sofia, Bulgaria, while the conference in Bucharest with contributions by the Prime Minister’s office and by the National Defence College (NDC) of the National Defense University, Bucharest, Romania – all in cooperation with the Institute for Techniques of Intelligent Systems, Federal Armed Forces University, Munich, the Institute for Parallel Processing of the Bulgarian Academy of Sciences (IPP-BAS), Sofia, Bulgaria, and the European University, Faculty of Social Science, Skopje, FYROM<sup>6</sup>.

In addition a coordination conference of co-directors and staff was organized in Skopje and Ohrid by the Macedonian co-director Prof. Dr. Zoran Ivanovski and his staff.

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<sup>5</sup> Turkey recognizes Macedonia with its constitutional name

<sup>6</sup> See fn 5

**7.5.1.** The **first** international conference of the project was held in Sofia in June 2007. It was focused on the problems of “Policy and Models for R&D Management in Support of Defence Industrial Transformation“. 25 reports and presentations were presented by 38 participants. There were salutations by Prof. Plamen Mishev, Vice-Rector of UNWE, Mr. Simeon Nikolov, Deputy Minister of Defence, Ms. Ivelina Bahchevanova, Head of Directorate, Ministry of Economy and Energy.

The aim of the Conference was to report and discuss the results of the first six-month period of the project work connected with Objective 1 “Concept and Model development for R&D management” and Objective 3 “Elaboration of Defence R&D Management Network for Scientific Cooperation (NfSC) in the SE European region”. During the Conference methodological and practical issues of Objective 2 “Development of Common Policy Framework for R&D management” were discussed. Leading researchers from Bulgaria, Croatia, Germany, Macedonia, Romania, and experts from the Bulgarian institutions formulating the R&D and defence industry policy and representatives of the end-user organisations took part in the Conference. After the conference, the reports were published in English in a special volume.

**7.5.2.** The **second** international conference of the project entitled “Research and Development Strategies: Support of Dual Industrial Transformation” was hosted by the Romanian National Defence College and was held in Bucharest 01-03 November 2007. It was outstanding conference in terms of the high level of political participation including the State Secretary of the Prime Minister’s office delivering a policy address; top military speakers from the Ministry of Defence up to the 3-star level of the General Staff delivering on “Armaments Planning”; and a candid American guest speaker, Professor Dr. Mark L. Montroll, representing “The Industrial College of the Armed Forces”, National Defence University, Washington, D.C., USA (see more under the heading “Romanian team” in **7.9.2.** below).

**7.5.3.** The third international conference was held again in Bulgaria, in Varna on May 29-30, 2008. The topic was “Security and De-

fence R&D Management: Policy, Concepts and Models“. 44 participants delivered 35 reports and presentations. The conference was organized by the Department “National and Regional Security“, University of National and World Economy, Sofia/Bulgaria in cooperation and with the active support of Varna Free University and Naval Academy, both in Varna/Bulgaria. Opening speeches were delivered by Dipl. Pol. Heinrich Buch, NATO-country Project Director, Capt. (Navy) Prof. Boyan Mednicarov, Deputy Commandant of Naval Academy, Varna, Prof. Anna Nedyalkova, Rector of Varna Free University, Prof. Tilcho Ivanov, Partner-country Project Director, UNWE. After warm welcoming speeches the conference work started with an Online Video Conference and insights into distance-learning provided by Mr. Goran Mihelcic, University of the Bundeswehr, Munich. The Video Conference which focused on simulation for training, analysis & acquisition was held together with IABG in Munich-Ottobrunn, and – for the technical aspects of distance learning/teaching – with PEWOTECH Business Consulting in Cologne-Hürth in Germany. More than 15 universities, institutions and defence companies took part in the conference. Presentations, contributions and findings of the conference were published in the special volume “Security and Defence R&D Management: POLICY, CONCEPTS AND MODELS“, International Conference 29–31 May (2008), Varna, Bulgaria.

In the meantime a much needed coordination conference of the co-directors and their staff, which had to clear R&D policy issues and the way ahead of the project, was being most carefully prepared by the Macedonian team. The conference successfully took place on 28-30 November 2008 in Skopje and Ohrid, both FYROM<sup>7</sup> (see more under the heading “Macedonian team” in **7.9.3.** below).

**7.5.4.** The **fourth** international conference of the project was held in Sofia on 14–15 May 2009 under the patronage of the Rector of UNWE, Prof. Borislav Borisov. The conference discussions were devoted to “Business and Science for Security and Defence Industrial R&D“. The participants were welcomed by Prof. Dr. Borislav Bori-

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<sup>7</sup> Turkey recognizes Macedonia with its constitutional name

sov, Rector of UNWE, Dr. Nickolay Tzonev, Minister of Defence of the Republic of Bulgaria, Dipl.Pol. Heinrich Buch, NATO-Country Project Director, Prof. Dr. Tilcho Ivanov, Partner Country Project Director, UNWE, Assoc. Prof. Dimitar Dimitrov, Head of Department “National and Regional Security”, UNWE. 26 reports were presented by the researchers from the Department “National and Regional Security”, UNWE, Sofia/Bulgaria; Institute for Parallel Processing of the Bulgarian Academy of Sciences; the National Defence College, Bucharest/Romania; the Ministry of National Defence, Bucharest/Romania; the Faculty of Economics of the European University, Skopje/FYROM<sup>8</sup>; the Military Academy, Skopje/FYROM<sup>9</sup>; the Ministry of Defence, FYROM<sup>10</sup>; the National Defence Academy, Sofia/Bulgaria; the Centre for National Security and Defence Research of the Bulgarian Academy of Science; the Department of Information Technologies and Communications, UNWE, Sofia/Bulgaria; the Department of Management, UNWE, Sofia/Bulgaria; the Department of International Economic Relations and Business, UNWE, Sofia/Bulgaria; the Bulgarian Association of the Conflictologists, Sofia and others, including a presentation by the Bulgarian defence company “Gama Proekt 99 Ltd”. Several young researchers and PhD students (Yuri Tsenkov, Teodora Gechkova, Nedko Tagarev) took part in the conference. The reports were published in a special volume in English by Publishing House „Avangard Prima” in NATO-SPS format.

**7.5.5.** The final presentation of the project’s results – and in detail the scientific results of Objectives 1–4, which were presented by the coordinators – took place in the setting of a **fifth** international conference in the presence of representatives of the Bulgarian government and end-users and with press coverage on 11 December 2009 at UNWE in Sofia. This event was coordinated with the graduation ceremony at UNWE, where it gained much sympathy, media attention and wider visibility, also because young researchers with stipends from the project graduated as MSc.

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<sup>8</sup> See fn 7

<sup>9</sup> See fn 7

<sup>10</sup> See fn 7

**(Annexes show photos and explanations of the conferences, co-directors' meetings, students' conferences and academic training in the Center of Excellence)**

## **7.6 Students' conferences**

**7.6.1.** The Students Conference on “Concepts, Models and Policies for R&D Management in Support of Defence” was held on 28 March 2008 at the University of National and World Economy, Sofia. It was organized by the Department “National and Regional Security” within the framework of project SfP-982063, funded by NATO programme “Science for Peace and Security“. The reports was published in Bulgarian.

**7.6.2.** The next students' conference was held on 11 May 2009 at the University of National and World Economy – Sofia. Bachelor and Master Students presented their theses and views on Defence and Security Economics. Bachelor student Asya Dimitrova was awarded by the Dean of the Faculty ‘Economics of Infrastructure’ for her report.

## **7.7. Technical Equipment**

The efforts of the research teams were directed to the installation of all the necessary equipment, needed for the CoE. The rooms of the CoE underwent restoration by UNWE and the equipment was purchased as planned in the framework of the project.

The CoE was officially inaugurated on 14<sup>th</sup> of May 2009 in the UNWE building in the presence of Dipl.Pol. Heinrich Buch, NATO-country Project Director, and Prof. Dr. Tilcho Ivanov, Partner-country Project Director, UNWE, as well as co-directors and representatives of project partner countries together with the participants of the ongoing international conference.

The CoE has four rooms as follows:

- Administration rooms (5027 and 5028) equipped with four dual-boot book-size desktop computers, three printers, one copy machine and two scanners.
- The Training Room (5024) equipped with 8 dual-boot book-size desktop computers for students, one video server / lecturer computer, one multimedia projector with wide screen, camera and audio conference system with 3 microphones, amplifier and 2 speakers.
- Conference Room (5025) equipped with one operator's dual-boot book-size desktop computer, two dedicated video servers, two multimedia projectors with two wide screens, two cameras, audio conference system with 5 microphones, amplifier and 4 speakers. The office equipment includes copy machine, fax and a printer.

All rooms have wireless and LAN access to the Internet and to the UNWE's network. In order to ensure the mobility of both lecturers and students, the CoE has one laptop and five nettops.

The CoE's staff was capable to test new Information Technologies and to simulate the information system environment through the one Application Server IBM x3400 series, deployed in room 5025. The Server also plays the roles of Directory and Network Server for the CoE. All 13 desktop computers have the following description:

<b>Operational Systems</b>	Dual Boot Windows Vista / Fedora 11
<b>Office</b>	Microsoft Office 2007 / Open Office 3
<b>Project Management</b>	Planner
<b>Statistical Software</b>	R for Excel / Rkward
<b>Business Process Modelling</b>	BPMN Project Tool for Eclipse

The desktop computers can be connected to the EVO videoconferencing system. Two dedicated Video Servers in room 5025 are running with Windows XP System. The servers have Office Package MS Office 2007 and function as video-audio servers for the EVO videoconference system and the presentation computers. The serv-

ers are controlled remotely by the operator of the EVO sessions through the VNC server/client installed on both the servers and the operator's computer.

The Video Server in room 5024 has similar software packages as the desktop computers and it functions as the Video/Audio Server for the EVO conference system and as a Desktop computer for lecturers in the Training room.

The Application Server has many roles and its function as Application Server is only one of them. The main operational system running on the server is CentOS 5 with XEN virtualisation hypervisor. The virtualisation technology permits the CoE's team to install many different virtual machines and to simulate the work of networks. It is also possible to use different OS installed on different virtual hosts.

On the Server there are currently two permanent virtual hosts installed – Windows Server 2008 running Directory and Application Server services and Fedora 11 running Fedora Directory service and Virtual Private Network service. The idea was to have one single point of authentication through the LDAP Directory provided by Fedora Directory service in order to alleviate the access to all of the CoE's resources and services for both CoE staff and trainees.

Like all IT purchased with this project's funds, the IT for the CoE was marked as "NATO property".

## **7.8. Training of trainers**

Several research visits were held within the framework of the project – in Munich area, Germany (2007-2009) and Brussels, Belgium (2008).

**7.8.1** The Bulgarian team visited several major defence producers and R&D organisations in the Munich area, where presentations and discussions took place. The visit was prepared by the PPD, Prof. Dr. Ivanov, and Assoc. Prof. Dr. Dimitar Dimitrov. The researchers visited EADS – European Aeronautic Defence and Space Company, Krauss-Maffei-Wegmann for combat tanks (Leopard)

and armoured vehicles, Bosch-Security Systems of Siemens, the University of the Bundeswehr, ITIS (Institut für Technik Intelligenter Systeme), IABG – Industrieanlagen Betriebsgesellschaft, especially the defence division with Modelling and Simulation. The visit was perfectly organized and supported by Dipl.Pol. Heinrich Buch, NATO-Country Project Director (NPD).

**7.8.2.** Similar research and information exchange visits in Munich, all managed and organized by the NPD, were carried out by the Romanian team in June 2009 and by the Macedonian co-director, Prof. Dr. Ivanovski, now rector of the European University Skopje, in September 2009. These contacts were particularly helpful for the project work and continue also after the end of the project.

**7.8.3.** The Bulgarian research team from the Department "National and Regional Security", UNWE visited the NATO Headquarters and the European Defence Agency in Brussels in the period 23-25 November 2008 within the framework of this project. The researchers held several meetings and presentations with NATO and EDA representatives – among them Mr. Richard Froh, Deputy Assistant Secretary General for Armaments, NATO, and Christian Breant, R&T Director, EDA. One of the objectives of the visit was to present the interim project results and to discuss further project developments. The Brussels-based Bulgarian representatives to NATO and EDA also took part in the meetings and discussions. The visit was organized with the support of the Ministry of Defence of the Republic of Bulgaria and the Permanent Delegations of the Republic of Bulgaria to NATO and the EU in Brussels, Belgium.

**7.8.4.** According to the project plan of activities, the regular co-directors' meeting was held in Skopje and Ohrid, Macedonia in the period 27 November – 01 December 2008. The meeting was very well organized by the Macedonian co-director, Prof. Dr. Ivanovski, and was hosted by the European University – Skopje, the best and biggest private university in the Former Yugoslav Republic of Macedonia<sup>11</sup>, which is perfectly equipped with modern IT and owns ex-

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<sup>11</sup> Turkey recognizes Macedonia with its constitutional name

traordinary printing facilities, including work for the press. Both, NPD and PPD, emphasized the need to improve policy coordination, made proposals and were supported by all delegations in this effort. Several approaches were discussed and preliminary decisions taken. The participants also discussed further activities within the project, budget issues and objectives as well as a call for papers for the conference in Sofia scheduled for the spring of 2009.

**7.8.5.** In the period 10–12 June 2009, according to the project plan, the training course for end-users, PhD students and students from all participating countries was organized by the CoE. Assoc. Prof. Dr. Statty Stattev, First Vice-Rector of the UNWE and Professor Dr. Hristo Parvanov, Dean of the Faculty “Economics of Infrastructure”, welcomed the participants. Video conferencing facilities (EVO system) were successfully used for presentations and discussions with online connections to Skopje, Bucharest, Munich, the town of Gabrovo, Bulgaria, and 3 locations in Sofia. Lecturers from the Department “National and Regional Security”, UNWE, the IPP-BAS and the National Defence College, Bucharest/Romania delivered their presentations from their “home positions”, answered questions and led discussions. At the end of the training course the participants received certificates for successful participation.

**7.8.6.** As a result of the research and the presented reports, four training packages were prepared together with one case-study for discussions:

- R&D Policy in Defence Industry + case-study “Acquisition of Helicopters for Republic of Danubia“ (Assoc. Prof. Dr. Dimitar Dimitrov);
- Management of R&D in Defence Industry (Assoc. Prof. Dr. Tsvetan Tsvetkov);
- IT Support for R&D in Defence Industry (Assoc. Prof. Dr. Georgi Pavlov and Assoc. Prof. Dr. Alexander Kolev);
- Acquisition in Defence Industry (Assoc. Prof. Dr. Elena Lacatus and Colonel, Assoc. Prof. Dr. Doina Muresan);
- Planning, Programming, Budgeting in Defence Industry (Assoc. Prof. Dr. Elena Lacatus and Colonel, Assoc. Prof. Dr. Doina Muresan).

## **7.9. National Contributions by Partner Institutions of the Project**

The purpose of paragraph 7.9. is to show in greater details the specifics of the contributions by each partner team.

### **7.9.1. Bulgaria – University of National and World Economy, UNWE**

The UNWE team with the PPD had leading functions for the academic and organizational coordination of the project tasks and for the integration of results. It had pivotal roles in joint or parallel working teams for achieving most of the project's objectives and deliverables such as

- R&DCM providing the coordinators for objectives 1–4,
- NfSC coordination and integration as well as database work,
- Policy Framework coordination and formulation
- CoE concept, acquisition and integration of IT and software, including EVO for video-conferencing, trials, coordination of course topics and shared lectures in academic training courses via distance learning / video conferences,

in addition

- preparation, conduct and evaluation of 4 out of 6 conferences,
- preparation and edition of most of the project's publications,
- a majority of the achieved academic graduations.

### **7.9.2. Romania – National Defence College, NDC**

The Romanian co-director, Mr. Iulian Fota, initially Director of the National Defence College of Romania, was nominated in January 2009 State Secretary Minister at the presidency of the Republic of Romania with functions as “Presidential Advisor for Security and Defence”. His outstanding status greatly increased the visibility, significance and attention to this project in Romania and beyond.

### **7.9.2.1. NDC-team activities October 2007-March 2008:**

Organized and hosted by the National Defence College, *Bucharest, Romania, (01-03 November 2007)* the 4th International Workshop of the NATO Project SfP 982063 and the International Conference: *“Research and Development Strategies: Support of Dual Industrial Transformation”* took place with high level political and military participation. The Secretary of State of the Prime Minister gave a policy address and the Romanian General Staff, represented up to 3-star level, focused on a wide range of armaments planning policy and issues. Guest speaker Professor Dr. Mark L. Montroll from “The Industrial College of the Armed Forces” of the “National Defence University” in Washington, D.C./USA candidly lectured on “Creating Strategic Opportunities for Transformational Innovation in a Globalized World”.

Gathering official representatives of the military and civil R&D from Romania as well as worldwide recognized specialists and industrial partners from the USA, Germany, Bulgaria, Macedonia and Romania, the conference’s topics were:

- Development of R&D policy framework compatible with NATO;
- Management of Security Related R&D in Support of Defence Industrial Transformation – overview of achievements and perspectives;
  - Romanian Research, Development and Innovation – Strategy and National Plan; opportunities for Public-Private Partnership;
  - R&D Strategies in support of industrial transformation;
  - Armaments Planning;
  - Creating Strategic Opportunities for Transformational Innovation in a Globalized World;
  - Research and Development of emerging technologies: Applied interactive duality;
  - Development of a “Macedonian Logistics Services Company”;

- Transforming the business of Defence and Security – IBM delivering defence and security related value today;
- Research and development in MARCTEL, MIRSAND and ROMARM companies.

**Implementation of results:**

- Preparation and circulation of the report of the international SfP conference 01-03 November 2007 in Bucharest,
- Aiming to learn from proceedings and initial results of other teams working on similar topics, the Romanian team also contacted the STACCATO EU Project that seeks to propose methods and solutions for the creation of a security market and a structured supply chain in Europe.<sup>12</sup>

**7.9.2.2. Activities April 2008-September 2008**

- Preparation of papers and other contributions for the International Conference in Varna – Security and Defence R&D Management: Policy, Concepts and Models
- **Participation** in the Varna Conference
  - LtCol., Assoc. Prof. Dr. Doina Muresan, Deputy Director NDC, Bucharest
  - Assoc. Prof. Dr. Elena Lacatus, Politehnica University of Bucharest
  - Liviu Matache – young scientist – MoD, R&T Agency, Clinceni, Romania
  - Marius Marmureanu young scientist MoD, R&T Agency, Clinceni, Romania

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<sup>12</sup> STACCATO (STakeholders platform for supply Chain mapping, market Condition Analysis and Technologies Opportunities) started 2007 as EU funded supporting activity under the Preparatory Action for Security Research, PASR, a follow up to SeNTRE, Security Network for Technological Research in Europe, funded under PASR 2004. Participating at the 4th International Workshop of STACCATO in Brussels, Dr. Elene Lacatus established a PoC for information exchange in order to avoid conflicting NATO-EU objectives for the SfP project's nations.

- **EDA documentation visit** elaborating the *Study on EDA's R&D Policy* (Assoc. Prof. Dr. Elena Lacatus) – Brussels, 2-4 July, 2008<sup>13</sup>

### 7.9.2.3. Activities September 2008-October 2009

1. Publication of the extended form of the Study Report regarding EDA (Dr. Elena Lacatus) and edition of the "Volume 5" of the NATO SfP Project 982063 series: "European Defence Agency as a Defence Industry Catalyst". In the same volume, the report of the 2<sup>nd</sup> "International Conference: Research and Development Strategies in Support of Dual Industrial Transformation" was included;
2. Participation in the co-directors' meeting in Skopje in November 2008 and in the joint technical sessions for settling on-line teaching modules with the entire Project Team (BG, DE, ROU, FYROM);
3. Preparation of teaching materials as support for the scheduled online teaching modules and publication of a special volume "Planning, Programming, Budgeting and Acquisition in the Romanian Armed Forces – Case Studies" by (now) Colonel, Assoc. Prof. Dr. Doina Muresan in 2009.
4. Widening the scope: Two specialists from the US Army International Technology Center–Atlantic (USAITC-A), an International Cooperative Program Specialist for Europe and a Scientist on Special Applications visited Bucharest to explore R&D cooperation program perspectives in Romania. This visit was an outcome of the October 2008 visit of the ICAF's Students group from NDU, Washington D.C., USA, at Romanian R&D Institutes, Academies and SMEs<sup>14</sup> (both Military and Civil).

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<sup>13</sup> Talks with EDA representatives: Dick Zandee, Head Planning & Policy Unit; Solon Milas, Research & Technology Directorate; Patrick Lefort, Defence Industry & Market Directorate.

<sup>14</sup> Within the framework of NATO SfP project 982063.

#### **7.9.2.4. ACCOMPLISHMENTS**

1. Curricula for teaching module: “Acquisition in Defence Industry”, (Assoc. Prof. Dr. Elena Lacatus).
2. Curricula for teaching module: “Planning, Programming, Budgeting in Defence Industry”, (Assoc. Prof. Dr. Elena Lacatus).
3. Study on EDA’s R&D Policy (Assoc. Prof. Dr. Elena Lacatus).
4. Case Studies – Planning, Programming, Budgeting & Acquisition in the Romanian Armed Forces (Colonel, Assoc. Prof. Dr. Doina Muresan).
5. Official sources of the Romanian producers and MoD contractors – (Assoc. Prof. Dr. Elena Lacatus.)
6. Presented papers at International SfP Conference in Varna – *Security and Defence R&D Management: Policy, Concepts and Model* (Assoc. Profs. Colonel Dr. Muresan and Dr. Lacatus).
7. Attendance of young scientists Liviu Matache and Marius Marmureanu (both MoD’s R&T Agency, Clinceni, Romania) at the International Conference – *Security and Defence R&D Management: Policy, Concepts and Models*, detailed dissemination of Conference Papers and discussions of the Project’s Lessons Learned in their military R&D organization
8. Involvement of young scientists Liviu Matache and Marius Marmureanu together with NDC staff and senior students in a first local **webinar** lecture series as a prerequisite module for the coming online learning sessions.

#### **7.9.2.5. PROGRAM VISIBILITY beyond project partners**

1. Mrs Kathleen Kingscott (ICAF, NDU, Washington D.C., USA) visit to National Defence College as an echo of the previous summer documentation visit of Assoc. Prof. Elena Lacatus at ICAF, NDU. As the visit made

a bridge between ICAF-NDU and the NATO SfP Project team, Mrs Kathleen Kingscott came to prepare a ICAF students' group documentation visit on *The Researchers Condition In Eastern Europe* during the last part of October, 2008.

2. Dialogue with representatives of EDA's Policy, Research and Management Directorates during Assoc. Prof. Elena Lacatus' research visit 2008 at EDA's HQ in Brussels for the documentation of EDA activities in the field of R&D.
3. Focusing on the present and future impact of the studies documented and published with the support of the NATO Science for Peace and Security Programme during SfP Project 982063, it is noteworthy that the published books have already been acknowledged as useful working tools by the Delegates' Group of Senior Executive Students and Academics from the Industrial College of the Armed Forces (ICAF) of the U.S. National Defense University, Fort McNair, Washington, DC, USA (visiting National Defence College of Bucharest in October 2008, as an outcome of the documentation visit of Dr. Lacatus at ICAF NDU in 2007), by academics from the National Defense University, Tel-Aviv, Israel, and by officials of EDA (Dick Zandee, Head of Planning & Policy Unit in a letter addressed to the National Defence College of Bucharest).

### **7.9.3. Macedonian team**

The first practical step of the project was the formation of the Macedonian project team in Skopje, which worked under the direction of Prof. Dr. Zoran Ivanovski, Project Co-Director for FYROM<sup>15</sup>, then Dean of the Faculty of Economics and now Rector of the European University Skopje. In the course of the project the Macedonian Co-Director had to make some personnel changes in the structure of

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<sup>15</sup> Turkey recognizes Macedonia with its constitutional name

his working group (compared with that of the initially Approved Project), which were due to fluctuation and the functional availability of personnel. The Macedonian team consisted of the following personnel:

- Assoc. Prof. Dr. Aleksa Stamenkovski, Pro Dean of the Faculty of Economics, European University (Former State Secretary for Defence, Chief of the Intelligence Agency, etc.);
- Nikolov, Elenior – Military Academy – MSc, Major, lecturer – PhD student (work on dissertation);
- Bogdanoski, Mitko – General Staff ARM – MSc, Captain, – PhD student (work on dissertation);
- Contev, Robertino – MoD – MBA student (work on MBA thesis);
- Moneva Maja – General Staff ARM – MBA student;
- Stankovska, Aleksandra – European university – assistant – PhD student (work on dissertation).

In the first six months of the project Mr. Mitko Bogdanoski graduated at the Faculty of Informatics. He advanced to MSc. and became Ph.D student.

By the end of the project's first year Mrs Aleksandra Stankovska defended (September 2008) her Ph.D thesis, received her doctoral title and became Assistant Professor at the Faculty of Economics of the European University Skopje – Republic of Macedonia.

In January 2009 Major Robertino Contev successfully defended his Master thesis on Human Rights.

In the last six months of the project two more changes of personnel occurred. Major Robertino Contev was assigned to the NATO command in Lisbon, Portugal, and left the project team as well as Captain Maja Moneva, who went to a mission abroad. One new member to the project team was elected: Elena Stoichkova, MBA student and assistant at European University.

Finally, (now) Lieutenant-Colonel Elenior Nikolov successfully defended his Ph.D thesis at the faculty of engineering, Saints Cyril and Methodius University, Skopje.

Members (young researchers) of the Macedonian team are/were MBA and PhD students and worked simultaneously on the project and on their post-graduate and doctoral studies. The two Ph.D. and two Masters' degrees were the final academic result of the project within the Macedonian team, in other words, **4 academic graduations out of 5 stipends.**

**Details:** Lieutenant-Colonel Nikolov, lecturer at the Military academy "General Mihailo Apostolski" was the "coordinator" of the team of young researchers with responsibilities to distribute and coordinate work amongst the team-members. However, all researchers had obligations and responsibilities to prepare individual papers – for previously distributed topics/subjects and sub-parts of the joint project. This was also how the contribution of each participant in the project could be measured. The participants' different specialties are:

- Nikolov Elenior – R&D
- Bogdanovski Mitko – Technical and informatics research
- Contev Robertino – Political aspects, Methodology, etc
- Moneva Maja (Elena Stoichkova) – Economic aspects
- Stankovska Aleksandra – Economic aspects and Industry transformation

The Macedonian team organized work on an individual basis and held regular meetings every two weeks, where actual questions were discussed and problems solved. Prof. Dr. Stamenkovski and Project Co-Director Prof. Dr. Ivanovski made suggestions for each paper and gave answers and directions for performing future tasks. The professors also worked on "crucial" questions and controlled the efficiency of each participant.

Work distribution was based on tasks, which were received from and coordinated with the PPD Prof. Dr. Tilcho Ivanov. The Macedonian team followed closely the "Plan of Activities and Deliverables" and finished all planned activities on time and in required quality:

- Questionnaire 1 on National R&D systems
- Questionnaire 2 on Research Methodology development
- First draft of the Research Methodology

- Comparative Observation (CO) of developed countries regulations and practices – study on Germany.

In the second year of the project, the team submitted 2 papers focussing on Objective 2 development of a policy framework compatible with NATO – in order to develop and strengthen the common policy framework of internationally coordinated R&D policy in the defence industry sector as a prerequisite for steady economic growth and effective security.

In accordance with the Work Distribution Plan and according to the Memorandum of the Project from that phase, the Macedonian team engaged in the following tasks:

1. To prepare **1 document** dedicated to R&D policy of NATO.
2. To prepare and distribute the paper “Security and Military R&D National Policy of the Republic of Macedonia (DRAFT – Proposal)” for the National Policy R&D-framework
3. Preparation and research concerning the data for the ‘Project Database’. The data had to comprise of research and scientific projects particularly related to *R&D for the Macedonian Defence Industry* (today and in the near future). These data were compiled in about 20 records/CD/DVD.

All planned activities were finished on time and passed quality checks. Together with additional materials that could be used jointly, the draft of the paper “Security and Military R&D National Policy in the Republic of Macedonia” was circulated as well as improved in accordance with partners’ suggestions.

According to the Work Distribution Plan and the Project Memorandum at this phase of work, the Macedonian team’s tasks were:

1. To work on the Database – Scientific Network Preparation and research concerning the data for the Project Database (see Para 3 above).

2. To organize education and training of young researchers at the European University.
3. To improve the Draft “Security and Military R&D National Policy in the Republic of Macedonia” for the National Policy R&D-framework.
4. To establish close collaboration with partners.
5. To prepare papers for international conferences of the project.

In order to prepare education and training, the Macedonian team organized all necessary preparatory work and offered training for personnel in MOD FYROM<sup>16</sup>. The Military Academy as well as the General Staff sent their representatives to the training sessions.

All planned activities concerning distance learning by video-conferencing and the testing of the used EVO system were accomplished. The European University owned modern IT equipment and resources were tested in order to check their compatibility with partners’ resources. After some testing, the European University was able to meet all conditions for the realization of online distance-education and training in the next phase of the project. The distance-training in R&D – coordinated by the CoE in Sofia - was performed in perfect conditions, and this important objective of the project was equally fully met.

The Macedonian team also organized the coordination conference – meeting of Co-Directors and their staff from 28–30 November 2008 in Skopje and Ohrid, which was held in the European University campuses (28 Nov – Skopje and 29–30 Nov Ohrid). During the conference, the system Microsoft Live Conference<sup>17</sup> was tested and presented to partners. The main task of the meeting was to discuss and improve coordination of R&D policies and to clear all open

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<sup>16</sup> Turkey recognizes Macedonia with its constitutional name.

<sup>17</sup> Microsoft Live Conference is a software for distance learning successfully used by European University, particularly to link the EUS campuses in Skopje and Ohrid.

questions for the subsequent project-phases, especially data base, distance learning/video-conferencing and budget issues.

In accordance with the “Approved Project and Budget” distribution, IT equipment of the brands DELL and HP was purchased and marked as “NATO-property”:

2007: 3 notebooks and 1 laser printer;

2008: 1 LCD Projector OPTOMA EP 721 SVGA and 1 small camera;

2009: 2 notebooks and 1 desktop PC.

All acquisitions were necessary to meet the objectives of the project, especially research- and project-presentations, creation of data base elements and distance learning/distance teaching via the CoE in Sofia.

More than 20 visits to industrial facilities as well as participation in conferences and workshops in Macedonia and abroad were carried out in order to introduce the project to the business sector (defence and defence related industry) and to exchange views between economy, academia and the R&D sector in ministries of the government.

Finally, the Macedonian team published its results/findings in the book Project Proceedings of Research Reports by Macedonian Team, which was delivered to the MoD, General Staff, Military Academy, Ministry of the Interior and all relevant government agencies in the security sector.

On the whole, the project as well as its approach, achievements and prospects were introduced to the political level of Macedonia as well as to top military representatives. The project’s publications were acknowledged as useful working tools by the National Ministry of Defence.

#### **7.9.4. Bulgaria: Institute for Parallel Processing of the Bulgarian Academy of Sciences, IPP- BAS**

The IPP team had primarily supportive functions for all information and IT related issues of all project teams and took up two important tasks:

1. Establishing a stable, sustainable and reliable videoconferencing system.
2. Creation and installation of the “Data Base Management System”.

## **1. Videoconferencing**

Within the framework of the SfP-982063 project, the participating institutions needed an effective, reliable and high-quality system for audio-video communication. There are numerous possibilities for video transferring software like Skype, Microsoft NetMeeting, ICQ, but the features of these programs are limited and thus they are inappropriate for use in large projects. The IPP-conducted research came to the conclusion that the most appropriate option was to use the VRVS (Virtual Room Videoconferencing System) – an Internet-based videoconferencing system originally developed by CERN<sup>18</sup> and maintained by Caltech<sup>19</sup>. The VRVS-project shut down in April 2008 and was re-launched as a new project called EVO (Enabling Virtual Organizations), extending the abilities of VRVS.

### **1.1. Enabling Virtual Organizations (EVO)**

EVO, developed by researchers at Caltech (<http://evo.caltech.edu>) is a videoconferencing and desktop sharing system, designed to provide a seamless real-time collaboration platform for bridging remotely located collaborators and resources in support of science and research. Today EVO is widely and extensively used by thousands of collaborators in many disciplines, as well as by many groups of educators and students worldwide.

Researchers involved in major global scientific projects may rely on remote access to both collaborators and data throughout all phases of their projects, whether working on desktops or laptops with any of the major operating systems, in conference rooms using standard videoconferencing equipment, in experimental control rooms or auditoriums.

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<sup>18</sup> European Organization for Nuclear Research.

<sup>19</sup> California Institute of Technology.

The EVO architecture came as a result of over ten years of development and large-scale operation of collaborative tools, and Caltech's unique communications fabric for high-performance messaging, pervasive monitoring and autonomous control of global-scale systems.

The integration of the MonALISA agent-based system (<http://monalisa.caltech.edu>) into the new EVO architecture was an important step in the evolution of the collaboration service towards a globally distributed dynamic system that is largely autonomous.

Through the use of intelligent agents, EVO automatically directs the data streams, optimally interlinks the sites participating in a conference, and moderates the data flows and their quality to accommodate a wide range of network conditions. This provides around-the-clock system operations supporting many thousands of users, with a minimum of human intervention.

On the client side, EVO supports a wide range of audio, video and display devices, including support for HD (1080i) sessions on mass market PC systems with large single or multiple screens. EVO's OpenGL-based 3D VIEVO interface has the unique capability of handling a wide variety of real-time high-resolution video, audio and other content in the form of „objects“ for state-of-the-art scientific collaborative sessions.

## **1.2. EVO-Description**

EVO is a **collaboration system** that supports point-to-point and multipoint collaborative sessions. EVO provides a cost-effective system and is adaptable to different platforms and operating systems. It consists of a client (named **Koala**) that runs on the user's machine and a server (**Panda**) that provides a communication channel, as well as other admin services (scheduler, directory services, etc.).

The EVO Client (Koala) is based on Java and runs on the 3 main Operating Systems used by the scientific community: Windows, Linux and MacOS.

Previous versions relied on one main server and a series of 'reflectors' but EVO's architecture is now distributed, with both servers and clients operating peer-to-peer.

EVO users can communicate using audio, video and instant messaging, exchange files and share desktop applications. It is possible to book meetings or request them spontaneously.

Different technologies and protocols are supported and mixed (e.g. Mbone, H.323, SIP, QuickTime, AccessGrid).

EVO works in unicast and multicast environments and provides a gateway to participate to Access Grid meetings. The IPP-BAS is a leading participant in the European Grid Project and has access to the European Grid Network.

There are currently **298 Access Grid nodes listed, across 29 different countries**; 39 nodes have been quality assured.

## 2. Data Base Management System

For training purposes the **Open Source SQL database management system MySQL** was chosen.

- MySQL is a multithreaded, multi-user SQL database management system (DBMS) which has, according to MySQL AB, more than 10 million installations.
- MySQL is owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, which holds the copyright to most of the code base.

A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add access and process data stored in a computer database, a database management system is needed such as MySQL Server. Since computers are very good at handling large amounts of data, database management systems play a central role in computing, as standalone utilities, or as parts of other applications.

A relational database stores data in separate tables rather than putting all the data in one big storeroom. This adds speed and flexibility. The SQL part of “MySQL” stands for “Structured Query Language.” SQL is the most common standardized language used to access databases and is defined by the ANSI/ISO SQL Standard. The

SQL standard has been evolving since 1986 and several versions already exist.

Open Source means that it is possible for anyone to use and modify the software. Anybody can download the MySQL software from the Internet and use it without cost. The MySQL software uses the GPL (GNU General Public License) to define what you may and may not do with the software in different situations.

The MySQL Database Software is a client/server system that consists of a multi-threaded SQL server that supports different back ends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs).

The IPP team was acquainted with the tools for building a Database for Scientific Research in Defence, **DBSRD**:

- Hardware for the Web Server
- an Operating System
- Web Server software
- a database management system
- a programming or scripting language

Having considered that some of these tools are dependent on the others, especially not all database management systems are running on all operating systems and not all scripting languages can connect to all databases, the IPP team chose the following products:

**MySQL Database Server**  
**Apache Web Server**  
**PHP**

The above tools are frequently used together in building dynamic, real-time Web database applications and are often called by programmers the “dynamic trio”.

MySQL provides the database part, PHP provides the application part of our Web database application and the Apache web server is responsible for publishing and running our application on the Web.

Apache, MySQL and PHP are one of the most utilized combinations for developing content driven websites. From the fulfilled research and training it appeared that this combination is robust, flexible, provides a decent level of security, and the above mentioned components are available for many different platforms. A database server (MySQL) is a program that will store large amounts of information in an organized format that is easily accessible from scripting languages like PHP. For example, we can set up PHP to look into the database for a list of tasks that should be displayed on the Web site. The advantage of this would be twofold. First, instead of having to write a set of HTML files for each of our pages, we could write a single PHP file designed to fetch any task out of the database and display it. Second, to add a task to our site would just be a matter of adding the task to the database. The PHP code would take care of the rest by automatically displaying the new task along with the rest, when it fetches the list of tasks from the database. As we look at how data are stored in a database, it appears that the database is composed of one or more ‘tables’, each of which contains a list of components. Each table in a database has one or more columns, or fields and each column holds a certain piece of information.

### **3. Research and training of the IPP team**

- Young scientists participating in the project made an effort in preparing comparative analysis between existing systems for video-conferencing, demonstrating the advantage of the EVO system.
- Preparation of teaching materials for video training, describing the features of the Enabling Virtual Organizations (EVO) – its characteristics and capabilities.
- The EVO system was first installed and tested within the IPP team.
- Participation in the meetings with project partners to set and specify the EVO-parameters, and conducting internal tests.
- For a better quality of videoconferencing a server with appropriate parameters was bought and marked as NATO-property.

Procedural steps were:

- Web-based interface to data-bases;
  - Database architecture;
  - Database models and types;
  - SQL language.
- 
- The IPP team studied and worked on the creation and processing of the database. The selected trio Apache, MySQL and PHP was chosen as the most appropriate.
  - Building the logical data model of the Data Base for scientific research in defence (DBSRD – first draft) by using the MySQL editor Navicat and uploaded DBSRD on the server.
  - Investigations related to the ways and means to ensure the reliability and security of the database.
  - Participation of Milen Nikolov in the international conference “Security and Defence R&D Management: Policy, concepts and models” – 29-31 May 2008, Varna
  - Participation of Violeta Bogdanova in the international conference held in Sofia with presentation of the paper “Major problems in the Database security”.
  - A study on network security was conducted by Prof. Nina Sinyagina and Research associate Stella Russeva and the results were described in the paper: Defence mechanisms against computer attacks “Distributed denial of service” type.

The young scientists Todor Tashev and Milen Nikolov wrote and successfully defended their PhD theses.

The subject of the dissertation of Todor Tashev is: “Computer Architecture with computational resources in operating memory”

The subject of the dissertation of Milen Nikolov is: “Methods and Algorithms for Improving the Image Quality”.

## **8. Implementation of the overall Results of the Project**

This chapter gives a status of the implementation of the results at the end of the Project and of the expectations for the immediate and long-term future. Special attention should be paid to the economic and industrial benefits (short and long term) for the participating countries.

The results of all phases are documented and can be directly used for decision making processes in the participating nations as well by the respective administration as by industry's managers and experts. This implies approval of some new improvements of the methodology and approaches concerning the generation of novel solutions based on good practices in NATO member countries. It is important, that the decision making authorities of the participating nations were involved with representatives in the process from the beginning and were integrated as much as possible into the project work by participating in information exchanges, discussions and negotiations concerning the concept and, where possible, educational programs. The carrying out of the project with the involvement of experts and practitioners as well as young researchers is a prerequisite and good basis for capacity-building with and within a Network for Scientific Cooperation (NfSC) and a Centre of Excellence (CoE can serve a broad range of applications).

The training and educational programs focused on practitioners were helpful for the successful implementation of the Network for Scientific Cooperation for Defence R&D Management. (1) The best practices are described in the web-based segment of the Centre of Excellence in Defence Industry Transformation and Integration. (2) It is planned to disseminate and to distribute the results in principle to all parties as well as countries involved and to provide access via the CoE homepage and a hyperlink from the NATO Science Homepage.

Also, when first experiences of the practical use of the project's CoE were reached, co-directors and directors initiated media coverage cooperating with officials in administration and the military.

The results concerning methodology, models, approaches, conferences and point papers were made available in publications and to NATO authorities. In addition to the annual progress reports and dissertations of PhD students, a set of specialised reports, mostly conference reports, in a common NATO-SfP format and documents were produced on paper and electronically.

For the purposes of the project, a website – <http://sfp.e-dnrs.org> – was installed on UNWE server with links to the co-directors and the end-users involved. The standard NATO SfP header and footer and title were used; the establishment of a hyperlink by the SfP Programme Office from the NATO Science Homepage to the project homepage was installed. The produced models and databases will be made available and stored electronically in a web site of the Centre of Excellence with appropriate comments and a hotline for direct support/advice.

In more details the results will be utilised as follows:

1. To prepare R&D managers in the industry and administration;
2. To advice NATO compatibility in R&D;
3. To integrate the participating nations into the NATO Industrial Base;
4. To find synergies for better specialization and co-operation in/for nations.

End users of the results were involved into the project from the beginning:

1. The end-users were asked for their conceptual views on the database;
2. Participation in conferences and supervising meetings;
3. Contributions to the database;
4. Sending participants to project conferences and training sessions.

The end-results of the project will improve the normal activities of the end-user(s) by:

1. Using NATO standards in R&D management;
2. Learning and using NATO procedures in defence industrial co-operation;
3. Learning best practices of co-ordination between MoDs and industries;
4. Making use of new business practices like public-private partnership.

### **8.1. Criteria for Success**

The list of criteria, describing the effects of the proposed project, is presented in **Annex 2**.

The list includes criteria in four groups, relevant to the objectives defined in part 6 of this proposal, as follows:

1. Research and Development Concept and Model
2. Common Policy Framework
3. Network for Scientific Co-operation and database
4. Centre of Excellence

The definitions allow for straightforward quantification of project results and a formula to assess the overall performance of the project team. The respective weights of the four groups of measures are:

1. Research and Development Concept and Model: 30 %
2. Common Policy Framework: 20 %
3. Network for Scientific Co-operation and database: 20 %
4. Centre of Excellence: 30 %

Highest is the weight of R&DC Model and Centre of Excellence, thus leading to the most important deliverables of the project.

For accurate assessment of the sub-criteria (**Annex 2**) the following **quantifiable indicators** were used:

### **1. R&DCM**

**1.1.** The R&DCM was approved in 2008 by the international Varna conference

**1.2.** Five international publications on R&DCM were accepted and positively evaluated by five international experts – **threshold 2 publications**

**1.3.** More than 50 international scientists participated in the five conferences in Sofia, Varna, and Bucharest – **threshold 20 participants**

### **2. Development of policy framework compatible with NATO**

**2.1.** At the end of the project a workshop was organized with 30 participants from the defence industry and defence administration – **threshold 20 participants**

**2.2.** Two young scientists participated in RTO Panels – **threshold 2**

**2.3.** Three publications on R&D policy issues were accepted in international magazine and/or conference proceedings – **threshold 3**

### **3. Network and database**

**3.1.** The project's internet site is referred by three internet sites of international/NATO research organizations. **Completed**

**3.2.** Every participating country has a minimum of 20 records in the database for the major defence suppliers/contractors in their countries. **Completed**

**3.3.** There are no differences in the database structure with the NATO codification in respective areas. **Completed**

**3.4.** At the end of the project the mailing list of the project had 140 registered and active users. **threshold 100 users**

## 4. CoE (Center of Excellence)

4.1 During the project 4 training packages were prepared. – **threshold 4 packages**

4.2 At the end of the project 30 representatives of the defence industry and defence administration were trained in the CoE: **threshold 20 representatives**

4.3 More than 50 representatives of the defence industry and defence administration of participating countries participated in the conference in Sofia. **threshold 20 participants**

## 8.2. Actions taken to ensure the implementation of the end-results

- A preliminary inquiry on NATO project's research methodology. It was carried out among the members of the teams in DNRS at UNWE in Sofia, National Defence College and Ministry of Defence – both Romania, and Faculty of Social Science, European University Skopje – Macedonia. “Brain storming” for gathering ideas about developing a research methodology. Working out a plan for allocation of the activities. Relevant organizations, both from DoD and industry, were involved in the project, directly interested in the new model which was developed.
- Organisation and participation at the first international conference on the project „Policy and models for R&D management in support of defence industrial transformation”. Regular meetings of the working team on Objective 1.
- A travel by the Bulgarian team to Munich – Germany (25–28 November 2007). Meetings with experts from: Institut für Technik Intelligenter Systeme (ITIS), Logistics and Information Management (LOG), Krauss-Maffei Wegmann, Siemens and Industrieanlagen Betriebsgesellschaft (IABG). Also, Elaboration of an Action plan for adoption and improvement of the Concept and Model. Similar travel and meetings in Munich by the Romanian team in June 2009 and by the Macedonian co-director in September 2009.

- Preparation of Teaching materials on “Management of R&D in Defence Industry”, by Assoc. Prof. Dr. Tsvetan Tsvetkov, in order to ensure successful implementation of Activity 4.4. of the Project. Collection of opinions for improvements of the R&D Model in Defence and Security.
- Preparation of materials for demonstration of the final version of the NATO integrated R&D Concept and Model.

Regarding the implementation of the Project’s Results we should differentiate the **dissemination channels** as to properly evaluate the outcomes of the already phases of the project and the openings created for future outcomes.

**8.2.1. *The first dissemination channel*** was created through the NATO SfP Project International Conferences Series being held in each of the participant countries: Bulgaria, Romania and Macedonia. From the Kick-off Meeting and Conference (Sofia, October 2006) up to the last International Conference (Sofia, December, 2009) these international pools of civil and military researchers gathered experts from a wide range of social areas: Governmental Representatives, Public and Private Industry, Academics, NGOs, SMEs, Research Institutes and Senior Students. Through the Conferences’ main topics and the animated debates, which occurred during the sessions, the ideas and messages of this internationally teamed Project supported by the NATO Science for Peace and Security Programme crossed the Conference hall borders and created long lasting links between specialists having different professional background. The immediate scientific benefit as well as the political impact and the longer term cultural approaches – including academic interest in cooperation for policy purposes in the SEE subregion – are important.

**8.2.2. *A second strong dissemination channel*** was established with the project’s webpage and more than 40.000 clicks counted so far, or 60 clicks per day!

**8.2.3. *A third dissemination channel*** with long lasting effects consists the project publications (see page 56f).

**8.2.4. A fourth dissemination channel** was established ad-hoc throughout the documentation visits, training sessions and interviews. During each of these activities the preamble was pointed out by a brief presentation of the NATO SfP Project 982063, its participants, preliminary findings and the envisaged outputs.

- Bulgarian activities were detailed under the heading “training of trainers” (above) and included research and travel to Germany, the United States of America, France, Belgium and Israel.
- Romanian activities of members of the project disseminated and gathered knowledge related to the Project. Some activities were funded by the Romanian Ministry of Defence (conference participations in France and Israel). During all of these visits the team answered interesting questions raised by participants referring to the project effectiveness and the acknowledged metrics of an international team working environment. An immediate appraisal of the dissemination effectiveness was the participation of Professor Mark Montroll from the Industrial College of the Armed Forces, National Defense University, Washington D.C., USA, to the International Conference held at the National Defence College of Romania under NATO SfP Project framework (November 2007), the visit of Kathleen N. Kingscott, IBM Industry Chair & Visiting Professor from the Industrial College of the Armed Forces, National Defense University, Washington D.C., USA for preparing a documentation visit for the ICAF Senior Executive students and the visit of a large group of students and academics from ICAF-NDU (October 2008) to Romanian research institutes and companies dealing with dual applications of modern technologies.
- Macedonian activities: In Germany and other NATO and non NATO countries the Macedonian team members of the Project disseminated and gathered information related to the Project. During all visits inside of (the Former Yugoslav Republic of) Macedonia, and also in the Republic of Serbia, the main task was to scan and assess the situation in defence industry and dual-use industry after the period

of transition, to introduce the project to relevant companies and learn about their situation and R&D policies. Part of the team had opportunities to visit capacities that can provide products and services for the defence sector. Prof. Dr. Zoran Ivanovski also visited industrial and educational facilities in Germany (September 2009). During his stay in Germany he had meetings at IABG, which focused on “Modelling & Simulation” as well as Knowledge Development (hosted by Dr. Hans Jurgen Schirlitzki, Deputy CEO), at ITIS (Institute for Techniques of Intelligent Systems at the University of the Bundeswehr in Munich) with CEO Dr. Andreas Koester and his team as well as with modern energy industry. Still in September 2009 Prof. Dr. Ivanovski hosted Dr. Michael Krüger, vice-president EADS, at the European University in Skopje. These activities were followed by initiatives for future cooperation and planning new visits of defence industry companies.

**8.2.5. *The fifth dissemination channel*** was set up permanently through the project structure and consisted of the pool of Senior Students trained during the project and of those who had already been trained by the Centre of Excellence in or from Sofia. Its effectiveness was successfully proved during the *One Week Online Training Session* held in June 2009. A press conference was held in Sofia and the Bulgarian daily newspaper VECER published two articles about the project. In addition, two Bulgarian TV stations (SITEL and AB Channel) presented the project.

**8.2.6. *The sixth dissemination channel:*** Informal network of experts

Last but not least: After their MSc graduation or PhD promotion several members of the project’s teams were employed in and mostly promoted to responsible functions in the MODs of their nations, mostly with R&D as well as Planning and Acquisition responsibilities, thus adding an interesting segment to the overall network of valuable human relations, which was brought about by this project. This informal and very useful network of „Anciens of SfP 982063“ will outlast the project.

## 9. Conclusions

### Final Report SfP 982063 MANAGEMENT OF SECURITY RELATED R&D IN SUPPORT OF DEFENCE INDUSTRIAL TRANSFORMATION

The project required close cooperation of five institutions in four countries: the University of National and World Economy, UNWE in Sofia, the Institute for Parallel Processing of the Bulgarian Academy of Sciences, IPP-BAS in Sofia, the National Defence College of Romania, NDC in Bucharest, the European University in Skopje and the Institute for Techniques of Intelligent Systems at the University of the Bundeswehr, ITIS in Munich, the latter in purely supportive role. In addition, manifold information channels were established with the respective MODs, defence industries, institutes and academies.

The overall objective of the project was to study the actually fragmented R&D knowledge, skills and capabilities in Bulgaria, Romania and FYROM<sup>20</sup> as well as best practices concerning defence R&D in experienced NATO nations and to establish the academic as well as informational prerequisites for giving permanently practical recommendations and support for the transformation of security related R&D management to end-users in MODs and industries in the subregion in order to assist the integration of national defence industries into the NATO Defence Industrial Base.

**9.1.** From there the following **objectives of the project** were derived forming criteria for success and each supported by a specific coordinator from UNWE, Sofia:

1. Formulation of a R&D concept and model, **R&DCM**, coordinator Assoc. Prof. Dr. Tsvetan Tsetkov.
2. Development of an integrated **Policy Framework** for coordinating R&D policy, coordinator Assoc. Prof. Dr. Dimitar Dimitrov.

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<sup>20</sup> Turkey recognizes Macedonia with its constitutional name.

3. Creation of a Network for Scientific Cooperation, **NfSC**, and initiation of a **database**, coordinator Assoc. Prof. Dr. Georgy Pavlov.
4. Establishment and operation of a Centre of Excellence, **CoE**, integrating IT and multi-point video conferencing via the EVO system of CERN, coordinator Prof. Dr. Stefan Hristov.

The creation of a permanently updated MS-project plan allowed continuous progress and production control of all deliverables as well as their timely finalization including quality control. The cooperation was intensified by the project management as well as by members' participations in a series of conferences at different level, their documentation, evaluation and publication, field and research studies as well as individual and team contributions to conferences, project publications, preparations for academic graduations and joint academic training in four nations via video-conferencing coordinated and controlled by the Center of Excellence in Sofia.

## **9.2. Conferences**

After the kick-off meeting a total of five international project conferences were held, four out of them with UNWE-DNRS in Bulgaria: in June 2007 in Sofia; in May 2008 in Varna; in May 2009 and in December 2009 in Sofia; and one with NDC Romania in Bucharest in November 2007 with high level political and military as well as American participation. Additionally, an essential international coordination meeting of co-directors and staff took place in November 2008 in the European University in Skopje and Ohrid/FYROM<sup>21</sup>. In December 2009 in Sofia during the closing conference of the project and in the presence of representatives of the mass media, the Bulgarian MOD, the Ministry of Economy and Energy, leading representatives of UNWE as well as project co-directors and all Bulgarian participants, both, NPD and PPD, offered their very positive overall conclusions concerning the most

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<sup>21</sup> Turkey recognizes Macedonia with its constitutional name.

successful completion of this very productive multilateral project, stressing that it had been enabled by NATO-SPS funding.

In this setting the four coordinators of the joint work on the project's objectives presented the findings and final reports on their sectors of responsibility of the project's results – a public event with media coverage was followed by an address of the project's leaders to the graduation ceremony at UNWE, where the project had reached outstanding reputation and visibility.

### **9.3. Publications**

The following publications report about proceedings, research and conferences of the project:

1. "Public-Private Partnership in Defence and Security Sector – National Practices, Annual International Conference on Economics and Management of Security and Defence, Sofia, October 13-14, 2006, which was used for the kick-off of SfP project 982063 and was published in Sofia 2007 by: University of National and World Economy, Department "National and Regional Security".
2. "Policy and Models for R&D Management in Support of Defence Industrial Transformation"; International Conference, 28-29 June 2007 in Sofia, published in Sofia, 2008.
3. Comparative Observations of Developed Countries Regulations and Practices: "United States of America, Study Regarding the Country's Regulation and Practices on Research and Development Policy for Defence Industry", by Elena Lacatus (ed.), published in Bucharest, 2008.
4. "Security and Defence R&D Management: Policy, Concept and Models", International Conference in Varna, 29-31 May (2008), published in Sofia, 2009.

5. “European Defence Agency as a Defence Industry Catalyst” and International Conference in Bucharest in November 2007 “Research and Development Strategies in Support on Dual Industrial Transformation”, by Elena Lacatus (Project Contribution of National Defence College of Bucharest), published in Bucharest, 2009.
6. “Business and Science for Security and Defence Industrial R&D”, International Conference 14-15 May 2009, Sofia, published in Sofia, 2009.
7. “Planning, Programming, Budgeting, and Acquisition in the Romanian Armed Forces, Case Studies”, by Doina Muresan (ed.), published in Bucharest, 2009.

Publications 2 to 7 are printed in the NATO format with the header “SfP-982063 Management of Security related R&D in Support of Defence Industrial Transformation” and footer “This publication is supported by: The NATO Science for Peace and Security Programme”.

#### **9.4. Academic and additional achievements**

Making best use of 20 stipends, granted under the project, and due to minimal fluctuation of participants, the following graduations were undertaken:

* 2 habilitations	<i>all UNWE</i>
* 8 defended doctoral dissertations	<i>2 EUS, 2 IPP, 4 UNWE</i>
11 doctoral dissertations “in the making”	<i>2 EUS, 2 IPP, 2 NDC, 5 UNWE</i>
* 8 Masters of Science (MSc)	<i>2 EUS, 1 IPP, 5 UNWE</i>
5 MSc “in the making”	<i>1 EUS, 2 NDC, 2 UNWE</i>
* 13 Bachelors	<i>13 UNWE</i>
8 Bachelors in “in the making”	<i>8 UNWE</i>

- **31 academic graduations achieved**
- **24 academic graduations “in the making”**

The excellent academic achievements of the project are the result of intense work by students of all levels, good guidance as well as continuous care by the professors in this project and by the cooperative spirit of all participants. Several graduates were employed at responsible positions in their respective MODs.

An **additional achievement** of the Project, which could not be anticipated, was the **network of good relationships**, that could be built in just three years due to intense cooperation, joint research and conference participation, which led to mutual confidence and a spirit of trust and reliability, that would outlast the duration of the project, especially for those employed in government offices.

## 9.5. Careers

The **high visibility** of the project in participating nations within governments, academia and in the media **due to the co-directors** reflect their partially new functions. Other careers contribute to this effect.

1. The Romanian co-director, Mr. Iulian Fota, was nominated State Secretary in January 2009 with functions as National Security Advisor to the President of Romania.
2. The PPD and Bulgarian project-director, Professor Dr. Ivanov, serves as advisor to the Bulgarian Minister of Defence, the MOD as well as the Ministry of the Interior. He became lecturer at the Free University of Varna.
3. The Macedonian co-director, Professor Dr. Zoran Ivanovski has been promoted to Rector of European University and has functions as advisor to several ministers and the Macedonian Chief of Defence Staff.

4. Mrs Aleksandra Stankovska, Macedonian team, graduated PhD and became Assistant Professor at the faculty of Economics of the EUS.
5. Lieutenant-Colonel Adrian Morariu, Romanian team, became Director of the Romanian Government's Construction Oversight Agency.
6. Associate Professor Dr. Doina Muresan, Deputy Director NDC of Romania, was promoted to the rank of Colonel.
7. Associate Professor Dr. Elena Lacatus, Romanian team, became Romanian member in the evaluation team of EU – FP-7 projects.
8. Associate Professor Dr. Dimitar Dimitrov followed Prof. Dr. Ivanov and became Head of the Department National and Regional Security (DNRS) at UNWE.
9. Professors Dr. Stefan Hristov and Dr. Georgi Pavlov acquired full professorates after their habilitation.
10. After their graduation, a number of participants advanced to R&D related ministerial and academic occupations as well as to NATO staff occupations.

## **9.6. General final observations**

The demanding task to manage this very busy multinational project could be accomplished by the excellent cooperation of NPD and PPD as well as all co-directors, clear and qualified academic guidance by the PPD and intensive good work in cooperative spirit by the coordinators as well as all students. Special merits are deserved by coordinator Associate Professor Dr. Dimitrov for outstanding assistance to the PPD and leadership of all international CoE video-conferences as well as Associate Professor Dr. Elena Lacatus for outstanding research and publications.

Mutually supporting roles of the project directors were:

*NPD*: Policy advisor and main link to NATO-SfP, manager-coordinator, multinational integration, financial controller, military simulation expert and door-opener to Western companies and for giving selective conference contributions, such as key study results for new EU procurement rules in article 296 EU-Treaty.

*PPD*: Academic direction and coordination as well as academic procedural leader giving key note presentations at each conference, integration of MOD and business as well as management of conferences, publications and Bulgarian academic graduations.

- All four institutes of the three Balkan partners in the project were proactive, highly productive, very cooperative and “hungry” for progress as well as integration into Western structures. They deserve support and encouragement to promote specific initiatives.
- The developed coordinated policy framework should be followed up by efforts for policy coordination at the political level, for which a subregional political framework exists (“Regional Cooperation Council”).
- The time shares planned for the free-of-cost contributors to the project were not sufficient. In order to meet the planned objectives, the average time-overruns were about 100% or more for all co-directors and all personnel involved in IT integration and operations; the average time-overrun for project objective coordinators was about 50%. As a whole, the national contributions to the project were significantly higher than initially planned.
- The Network for Scientific Cooperation (NfSC), the Database and the Centre of Excellence (CoE) are “living institutions”. They are actually fully operational, appropriately equipped and can meet many actual needs. Their future value will depend on the extent to which they are used, and continue to be developed and adapted to new and additional requirements. The academic, industrial and governmental actors of the participating nations are

invited to make use of these assets and the valuable human network.

- The publications resulting from the project and in reference to the project as well as technical reports and selected presentations resulting from the project will be forwarded in printed form.

Professor Dr. Tilcho Ivanov

PPD

Dipl.Pol. Heinrich Buch, Colonel (ret.)

NPD

## **10. ANNEXES**



## 10.1. Annex 1

# PROJECT STRUCTURES AND ACTIVITIES

### Organization and management

	<b>Name of participant,</b> location (city, country)	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
1	Heinrich Buch	Federal Armed Forces University Munich	Member and Senior Researcher of ITIS	50%	NPD: project management, budget control, advice, conference set-up, training
2	Prof. Tilcho Ivanov	UNWE – “Department of National and Regional Security”	Director, Department “National and Regional Security”	50%	PPD: Concept and Model Development, Security related R&D Policy framework Development, Scientific Co-operation Network, Founding a Center of Excellence, planning and coordination
3	Stefan Hristov	UNWE – “Department of National and Regional Security”	PhD Associate Professor	40%	Concept development, Model development, Founding a Center of Excellence
4	Georgy Pavlov	UNWE – “Department of National and Regional Security”	PhD Associate Professor	40%	Network architecture research,  Database structure and procedures development, Hardware and software procurement and installation, Database software installation, promotion and testing, Work packages for training and education development, Teaching and learning activities
5	Tsvetan Tsvetkov	UNWE – “Department of National and Regional Security”	PhD Associate Professor	40%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
6	Dimitar Dimitrov	UNWE – “Department of National and Regional Security”	PhD Associate Professor	40%	Security related R&D Policy framework Development, Model development, Work packages for training and education development, Teaching and learning activities

	<b>Name of participant, location (city, country)</b>	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
7	Dimiter Velev	UNWE – “Department of Informatics”	PhD Associate Professor	40%	Network architecture research, Database structure and procedures development, Hardware and software procurement and installation, Database software installation, promotion and testing, Work packages for training and education development, Teaching and learning activities
8	Georgi Zabunov	UNWE – “Management and Business”	PhD Associate Professor	40%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
9	Emil Hristov	UNWE – “Department of National and Regional Security”	Assistant Professor	50%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
10	Georgy Penchev	UNWE – “Department of National and Regional Security”	Assistant Professor	60%	CoE institutional settings development, CoE website development, Work packages for training and education development, Teaching and learning activities
11	Konstantin Poudin	UNWE – “Department of National and Regional Security”	PhD student	70%	Security related R&D Policy framework Development, Model development, Work packages for training and education development, Teaching and learning activities
12	Nikolay Stavrev	UNWE – “Department of National and Regional Security”	PhD student	70%	Concept and Model Development, Elaboration of policy framework concept
13	Yuri Tsenkov	UNWE – “Department of National and Regional Security”	student	80%	Stocktaking Study of the R&D Environment
14	Elena Nankovska	UNWE – “Department of National and Regional Security”	student	80%	Collaboration between scientific partners
15	Galia Ivanova	UNWE – “Department of National and Regional Security”	student	80%	Bulgarian, Romanian and Macedonian defence industry transformation exploration

	<b>Name of participant, location (city, country)</b>	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
16	Prof. Stoian Markov	IPP – BAS	Director of Institute for Parallel Processing (IPP), BAS  Deputy President of Military Defence Industry Commission of Council of Ministry	50%	<b>Co-director:</b> Scientific Co-operation Network, Founding a Center of Excellence, planning and coordination
17	Violeta Bogdanova	IPP- BAS	Senior Researcher	45%	Network architecture research  Database structure and procedures development  Database software installation, promotion and testing
18	Stela Ruseva	IPP- BAS	Assistant Professor	40%	Network architecture research  Database structure and procedures development  Database software installation, promotion and testing
19	Iva Nikolova	Technical University-Sofia	Assistant Professor	45%	Network architecture research,  Database structure and procedures development  Database software installation, promotion and testing
20	Todor Tashev,	IPP- BAS	PhD student	70%	Site Design, E-mail List installation, groupware installation and promotion  Network architecture research,  Hardware and software procurement and installation
21	Julia Zidarova	IPP- BAS	PhD student	60%	Network architecture research,  Hardware and software procurement and installation,  Collecting data and database maintenance

	<b>Name of participant,</b> location (city, country)	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
22	Irena Nikolova	IPP- BAS	PhD student	25%	Network architecture research, Hardware and software procurement and installation, Collecting data and database maintenance
23	Milen Nikolov,	IPP- BAS	PhD student	70%	Network architecture research, Hardware and software procurement and installation, Collecting data and database maintenance
24	Dessislava Jordanova	IPP- BAS	M.Sc	60%	Database structure and procedures development, Database software installation, promotion and testing
25	Stefan Angelov	IPP- BAS	M.Sc.	60%	Network architecture research, Database software installation, promotion and testing
26	Iulian Fota	Defence College – Bucharest	Director of National Defence College – Bucharest	10%	<b>Co-director:</b> Concept and Model Development, Security related R&D Policy framework Development, Scientific Co-operation Network, planning and coordination
27	Safta Doru Gheorghe	Military Technical Academy, rector	Prof., PhD, Eng	15%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
28	Adrian Morariu,	National Defence College, Deputy director	MBA	15%	Security related R&D Policy framework Development, Model development, Work packages for training and education development, Teaching and learning activities
29	Cernat Mircea	Military Equipment and Technologies Research Agency	Prof, PhD, Eng	30%	Security related R&D Policy framework Development, Model development, Work packages for training and education development, Teaching and learning activities

	<b>Name of participant, location (city, country)</b>	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
30	Cosereanu Liviu	Military Equipment and Technologies Research Agency	PhD, scientific researcher	35%	Network architecture research, Database structure and procedures development, Hardware and software procurement and installation, Database software installation, promotion and testing, Work packages for training and education development, Teaching and learning activities
31	Condrea Ovidiu	Military Equipment and Technologies Research Agency	PhD student, scientific researcher	35%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
32	Bodoc Virginel	Military Equipment and Technologies Research Agency	PhD student, scientific researcher	35%	Stocktaking Study of the R&D Environment,  Collecting data and database maintenance
33	Codrea Sabin	Military Equipment and Technologies Research Agency	PhD student, scientific researcher	35%	Bulgarian, Romanian and Macedonian defence industry transformation exploration,  Discussion on national needs and specificities
34	Ilie Ovidiu Constantin	Military Technical Academy	Eng, PhD, young researcher	35%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
35	Takacs Alexandru	Military Technical Academy	Eng, PhD, young researcher	35%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities
36	Zoran Ivanovski	European University – Skopje	Rector and  Professor at Faculty of Social Science	50%	<b>Co-director:</b> Concept and Model Development, Security related R&D Policy framework Development, Scientific Co-operation Network, planning and coordination
37	Metodija Angeleski	European University, Skopje	Professor Dr.	20%	Security related R&D Policy framework Development, Model development, Work packages for training and education development, Teaching and learning activities

	<b>Name of participant, location (city, country)</b>	<b>Affiliation (institution, company)</b>	<b>Position and time dedicated to the project in %</b>		<b>Task in the project</b>
38	Orce Petreski	Military academy, "General Mihailo Apostolski", Skopje	Assistant Professor	25%	Concept and Model Development, Elaboration of policy framework concept, Work packages for training and education development, Teaching and learning activities,
39	Aleksandra Stankovska,	European University, Skopje	Ph.D student	30%	Stocktaking Study of the R&D Environment
40	Elenior Nikolov	Military academy, "General Mihailo Apostolski", Skopje	Ph.D. student	35%	Bulgarian, Romanian and Macedonian defence industry transformation exploration
41	Ackovski Yugo-slav	Military academy, "General Mihailo Apostolski", Skopje	Ph D student	25%	Network architecture research
42	Sasho Gelev	Military academy "General Mihailo Apostolski", Skopje	Ph.D. student	30%	Collecting data and database maintenance
43	Aleksandar Markovski	European University, Skopje	Ph D student	20%	Discussion on national needs and specificities
44	Associate Professor Dr. Elena Lacatus	POLITEHNICA University of Bucharest	Associate Professor and Analyst Dr. Lacatus and Colonel Dr. Muresan prepared and presented in joint video-conferences 2 CoE Training Packages: (1) "Acquisition in Defence Industry" and (2) Planning, Programming, Budgeting in Defence Industry	80%	key person for research and project contributions; publications in 2008: Project Volume 5: (1) EDA as a Defence Industry Catalyst; (2) International Conference (2007) Research and Development Strategies in Support of Dual Industrial Transformation; Study "United States of America", Study Regarding the Country's Regulation and Practices on Research and Development Policy for Defence Industry.
45	Colonel Assoc. Prof. Dr. Doina Muresan	National Defence College of Romania, Ministry of Defence	Deputy Director National Defence College	40%	major contributor and conference spokesperson for Romania; publication: Planning, Programming, Budgeting, and Acquisition in the Romanian Armed Forces. Case Studies (2009)

The project started with a kick-off meeting on 16.10.2006. Representatives of all partners took part in it. UNWE hosted the meeting



Under the framework of *NATO project SfP-982063* several International Conferences were organised in the period October 2006 – October 2009.



The first conference on “**Policy and Models for R&D Management in Support of Defence Industrial Transformation**” of the project SfP 98206, was organised in Sofia in the period 28-29 June 2007.

The second conference on “**Research and Development Strategies: Support of Dual Industrial Transformation**” from the project was hosted by National Defence College, Romania. It took place in the period 01- 02.11.2007.



The international conference on “**Security and Defence R&D Management: Policy, Concepts and Models**” was held under the framework of *NATO project SfP-982063* in the Bulgarian city of Varna. The Conference on Security and Defence R&D Management had the following objectives:

- discussing the applicable, sustainable and realistic policies, concepts and models for R&D management in support of the defence industry transition, which has to provide coordination with NATO and EU requirements;
- giving recommendations for harmonization of the national priorities and R&D policy;
- finding ways for implementation of IT solutions in support of R&D Management Model and providing framework for further development of educational and training packages.



Scientists and experts on Defence and Security Economics and Management; defence industry managers from Bulgaria, Romania, FYROM, UK, Poland and Croatia; many young researchers and bachelor students participated in the conference.





*The participants in the international conference visited Varna Free University “Chernorizets Hrabar” and N. Y. Vaptsarov Naval Academy in their free time*

The forth International conference on “**Business and Science for Security and Defence Industrial R&D**” was organised in Sofia, Bulgaria in the period 14-15.05. 2009



The participants in the conference discussed the applicable, sustainable and realistic policies, concepts and models for R&D management in support of defence industry transition, which has to provide co-ordination with NATO and EU requirements. They also gave recommendations for harmonization of the national priorities and R&D policy, tried to find ways for implementation of IT solutions in support of R&D Management Model and provided framework for further development of educational and training packages.



According to the project plan of activities, the regular co-directors' meetings were held in Sofia, Bulgaria in the period 28-29.03.2007;

in Bucharest, Romania on 03.11.2007; in Varna, Bulgaria on 31.05.2008; and in Skopje and Ohrid, FYR Macedonia in the period 27.11.–01.12. 2008.



*Co-directors' meeting in Sofia, Bulgaria, 29-30.03.2007.*

On 29-30<sup>th</sup> March, the Department of National and Regional Security at the University of National and World Economy hosted the first NATO SfP-982063 Project co-directors' meeting. Professor Dr. Plamen Mishev, Vice-Rector for Scientific Research and International Projects welcomed the participants in the First Project Co-Direc-

tors' Meeting on behalf of the academic board of the University of National and World Economy. The current results of Objective 1 "to develop a NATO integrated R&D Concept and Model (R&DCM) and Objective 3 "Development of Network for Scientific Co-operation and Database" were presented. The first six-month report for NATO was discussed during the meeting as well as ideas related to the other research work under the project.

During the coordination meeting two other activities took place:

- (1) A training session was held at IPP – BAS during which the VRVS system was presented and discussed.
- (2) The following day a workshop was organised during which key participants from Bulgaria and Romania presented their tasks and current achievements. The meeting was attended by doctoral and bachelor students and representatives of the end users - The Ministry of the Defence, defence industry enterprises, trade associations and research organizations. Several presentations were made by representatives of the Bulgarian defence industry – Electronprogress AD, Kintex AD. Representatives of the Bulgarian Academy of Sciences and the Association of Bulgarian Defence Industry also took part in the workshop.



*Co-directors' meeting in Bucharest, Romania, 03.11.2007*



The co-directors' meeting took place after the international conference on “**Security and Defence R&D Management: Policy, Concepts and Models**” hosted by the Romanian team. Future events and further tasks under the project were discussed such as organization of the next conference, the establishment and activity of the CoE on the project, etc.



*Co-directors' meeting in Varna, Bulgaria, 31.05.2008.*

On 31 June, after the international conference “Security and Defence R&D Management: Policy, Concepts and Models”, a coordination meeting was held with the participation of the project co-directors and representatives from Bulgaria, Romania and Macedonia. Future events and further tasks under the project were discussed,

among them the preparation of teaching materials by the end of 2008 and the organization of teaching activities in 2009.



*Co-directors' meeting in Skopje and Ohrid,  
FYR Macedonia, 27.11. – 01.12. 2008.*

The meeting was hosted by the European University – Skopje, the biggest private university in Macedonia. The participants discussed further activities under the project as well as the conference in Sofia scheduled for the spring of 2009. Alongside the working sessions, visits and discussions, the participants had time for a rich cultural programme, organized by the kind local partners in Ohrid and Skopje.

On 28<sup>th</sup> March 2008, the students' conference **“R&D Management Concepts, Models and Policies in Support of Defence”** took

place at the University of National and World Economy, Sofia. Bachelor degree students majoring in Economy of Defence and Security participated in it. Eleven reports were showcased. The students Nayden Ganchev, Ekaterina Bogomilova, Gergana Ilieva, Daniela Ilieva, Lilia Varbanova, Miroslava Tatarova, Tsanka Shahova, Gyurgitsa Kostadinova, Borislav Yordanov and Lybomir Atanasov were very active in the discussions. The collection of students' reports has been published.



*Students' conference "Infrastructure:  
Business and Communications"*

On 11<sup>th</sup> May 2009, the students' conference on "**Infrastructure: Business and Communications**" was hosted by the Economics of Infrastructure Faculty of the University of National and World Economy, Sofia. One of the sessions was dedicated to the business and defence

R&D management. Bachelor degree students majoring in Economy of Defence and Security participated in it. Eight reports were delivered during that session. Dipl.Pol. Heinrich Buch, NATO country SfP 982063 Project Director was guest of the students' conference.



*Students' conference "R&D Management Concepts, Models and Policies in Support of Defence"*

According to the project's success criteria, a CoE has to be established. The training of end-users and students from the participating countries has to be conducted in the CoE. The establishment of the CoE and the organization of a training activity included:

Step 1. The training room was equipped with nine workstations and was located close to the video-conferencing room.

Step 2. At the beginning of March 2009, the entire equipment of the training room at UNWE was tested by all project partners. Presentations with audio and video signals were transmitted from Skopje, Munich, Bucharest and two locations in Sofia. The system for video-conferencing called EVO was developed by The Californian Institute of Technology (commonly referred to as Caltech) and European Organization for Nuclear Research (CERN), Geneva.



Step 3. After successful tests of the video-conference system, the CoE was opened on 15<sup>th</sup> May during the international conference on **“Business and Science for Security and Defence Industrial R&D”** hosted by the Department National and Regional Security at UNWE. All partners were present at the opening.









Step 4. In the period 10–12 June 2009, according to the project plan, a training course for end-users, PhD students and students from all participating countries was organised by the CoE.



Associate Professor Dr. Statty Stattev, First Vice-Rector of the UNWE and Professor Dr. Hristo Parvanov, Dean of the Faculty “Economics of Infrastructure” welcomed the participants.



Lecturers from the Department National and Regional Security at UNWE, IPP-BAS and the National Defence College, Bucharest, Romania delivered their presentations.





At the end of the training course the participants received certificates for successful participation.



## **Travels abroad**

According to the project plan, the Bulgarian team from UNWE (key personnel and young researchers) visited several institutions and organizations in Munich in the period 25-29.11.2007. The visit was organised and supported by Dipl.Pol. Buch, NPD of the SFP-982063 NATO project. The participants delivered lectures and held discussions with leading defence producers and research organizations in the Munich area.



During their stay in Munich the key personnel and young researchers visited „Krauss-Maffei Wegmann. The capabilities of armored vehicle “Leopard 2” were demonstrated.



Bulgarian delegations had very useful meetings at the Institute for Techniques of Intelligent Systems at the Federal Armed Forces University, SIEMENS and IABG.



The research team of the Department National and Regional Security at UNWE visited NATO Headquarters and the European Defence Agency in Brussels in the period 23-25 November 2008. The visit was within the framework of the current project.

The researchers had several meetings and presentations with NATO and EDA representatives – among them Mr. Richard Froh, Deputy Assistant Secretary General for Armaments, NATO and Christian Breant, R&T Director, EDA. One of the objectives of the visit was to present interim project results and to discuss further project de-

velopment. The Bulgarian representatives to NATO and EDA also took part in the meetings and discussions.

The visit was organised with the support of the Ministry of Defence of the Republic of Bulgaria and the Permanent Delegations of Bulgaria to the European Union and NATO, Brussels, Belgium.



During the visit in Brussels, the Bulgarian ambassador to NATO Headquarters, H.E. Lybomir Ivanov, gave a dinner reception to the team of National and Regional Security, UNWE. H.E. Lybomir Ivanov expressed his personal interest in the project and underlined his support for the development of defence R&D policy in NATO member states.



## Annex 2

ID	Criteria for success	Specific value of success (weight factor)
	formula	W%
<b>1</b>	<b>R&amp;DCM</b>	<b>30% of total project</b>
1.1.	R&DCM degree of adequacy	9%
1.2.	R&DCM applicability to countries' conditions	9%
1.3.	Contribution to scientific knowledge in Defence R&D Management area	12%
<b>2</b>	<b>Development of policy framework compatible with NATO</b>	<b>20% of total project</b>
2.1.	Assessment of existing policy implications for participating nations	6%
2.2.	Balancing national policies and NATO policy in the field of R&D	6%
2.3.	Supervision of implementation and co-ordination of social effects in participating nations	8%
<b>3</b>	<b>Network and database</b>	<b>20% of total project</b>
3.1.	Internet site and mailing list popularity	4%
3.2.	All participating countries use and upload data in the database	4%
3.3.	Database compatibility with the R&DC Model and NATO codification	8%
3.4.	Identification of national R&D capacities in the defence sector	4%
<b>4</b>	<b>CoE</b>	<b>30% of total project</b>
4.1	CoE capacity for preparation of teaching packages	9%
4.2	CoE capacity for training young scientist	12%
4.3	CoE capacity to carry out scientific events, exchanges, conferences	9%

Dipl. Pol. Heinrich Buch  
Prof. Dr. Tilcho Ivanov  
State Secretary Iulian Fota  
Prof. DSc. Stoian Markov  
Prof. Dr. Zoran Ivanovski

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