



МИНИСТЕРСТВО НА ОТБРАНАТА

ИНСТИТУТ ПО ОТБРАНА „ПРОФЕСОР ЦВЕТАН ЛАЗАРОВ”

София 1592, бул. „Проф. Цветан Лазаров” № 2, факс: 02/92 21 808, <http://di.mod.bg>

REVIEW

By Professor DSc Stoyan Georgiev Denchev,
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on the competition for the academic position "Professor"
for a military officer in the field of higher education 5. "Technical Sciences",
professional field 5.3. "Communication and Computer Technology", announced in
the State Gazette (issue 81, 11.10.2022), in pursuance of Order of the Minister of
Defense No OX-916, 28.09.2022 announcing a competition and Decision of the
Scientific Council of Bulgarian Defence Institute "Professor Tsvetan Lazarov"
for selection of a Scientific Jury, Minutes No84, 09.12.2022

with a single candidate:

Col. Assoc. Prof. Dr. Eng. Nikolai Todorov Stoianov,
Deputy Director of the Bulgarian Defence Institute "Professor Tsvetan Lazarov"

1. Papers submitted by the candidate that are accepted for evaluation by the reviewer:

The scientific work of Colonel Assoc. Prof. Dr. Nikolai Todorov Stoianov, as an author, co-author or as a performer, includes 3 monographs, 3 university textbooks, 1 study and 129 publications, (articles and scientific reports) in Bulgarian (in Bulgarian 79 pcs.) and foreign (in Ukrainian 2 and 60 in English) editions. 36 of those publications are independent, and in 21 publications, the candidate is the first author.

Eighteen (18) publications from the scientific and applied researches of Assoc. Prof. Stoianov are in prestigious editions indexed in world-famous databases, including SJR editions: Q1 (II.3.80, II.3.82), Q3 (II.3.110), and Q4 (II.3.75, II.3.100, II.3.101, II.3.102) .

For the period after his habilitation as Associate Professor (2014) Colonel Stoianov submitted for review in this competition the following scientific production:

- 1 monograph;
- 1 chapter of a collective monograph;
- 3 published university textbooks;
- 1 studios, (Annex 2, Section II.2) and
- 41 publications.

I accept for review all scientific and applied scientific works submitted by the candidate.

2. General characteristics of the research, applied science and pedagogical activity of the candidate:

The research and applied activities of the candidate for professor are mainly related to research and applied applications for the needs of defense and security in the field of reliability of information and communication technologies, in the design and construction of automated information systems and cybersecurity systems. Its research objectives are also set in the field of cryptographic approaches and their software implementations. He also works in the field of creating mathematical, technical, experimental and other types of models and methodological tools for their practical implementation.

3. Assessment of the special training and activity of the applicant:

All presented by Assoc. Prof. Nikolai Stoianov and accepted by me for review monograph (including chapter of monograph), scientific studies, textbooks and publications are created at a high scientific and professional level.

My personal observations on his work and scientific and applied work give me reason to say that Assoc. Prof. N. Stoianov has extensive professional experience in the field of management of military scientific institutions (the candidate is respected Deputy Director of the Defence Institute "Professor Tsvetan Lazarov" at the Ministry of Defense). He is an excellent lecturer. His professional and scientific commitments in the field of defense and security make him stand out as a natural and charismatic leader in the field of military science.

Assoc. Prof. Stoianov has sufficient in volume and high quality scientific and pedagogical activity. He was the head of 7 graduates (bachelors and masters) at ULSIT. Under his scientific guidance two (2) doctoral theses were defended. Currently, he is the supervisor of five (5) PhD students.

4. Main scientific results and contributions:

The analysis of the submitted by the candidate scientific papers give me grounds to synthesize the following conclusions and assessments in terms of his research, applied science and teaching activity:

Research and good practice in the field of information security:

Original approaches to risk management and information security assessment have been proposed and implemented. The results of these studies are summarized in a published monograph [II. 1. 6].

The theoretical formulations proposed by the candidate for information security, computer networks and approaches to testing and analysis of the security of computer systems are presented in the published university textbooks (II.1.3, II.1.4, and II.1.8)..

The options for information security in different types of systems are presented in a series of publications [II.3.73, II.3.75, II.3.79, II.3.80, II.3.82, II.3.90, II.3.94].

It is important to emphasize the fact that the proposed approaches and models have been tested in a number of research projects II.4.24, II.4.30, SPIDER (Annex 2, Section II.4).

· Cryptographic methods and mechanisms:

Approaches to improving cryptographic systems in order to overcome the so-called quantum factor are focused on the evaluation of new cryptographic schemes and algorithms, as well as on new approaches to generate cryptographic keys. Research in this area is focused on creating new, the so-called "quaint sustainable" cryptographic schemes that necessarily not only can, but also should be used in security and defence systems. Here, the results obtained are published in II.3.72, II.3.81, II.3.100, II.3.105.

· Cybersecurity and Cyber Defense:

Research in the field of cybersecurity and cyber defense is differentiated in several directions:

- o Basic concepts in the methods for development, analysis and design of cyber security architecture are being systematized. The attention of the candidate is focused on various elements of similar architectures, technological models and metrics for cyber security. A system analysis of a multilayer model for cyber has been carried out. [II.2.11, II.2.12, II.3.76, II.3.78, II.3.92, II.3.93, II.3.95]
- o Some approaches for building protected systems in critical infrastructure have been analyzed and systematized. [II.3.85]. A model and method for critical infrastructure assessment are proposed, based on a study conducted in the Republic of Bulgaria under the general leadership of NATO [II.3.89]. A multilayer cyber security model of critical information infrastructure has been synthesized [II.3.92] .
- o Approaches for analysis and assessment of cyber security at strategic, operational and tactical (technical) level have been implemented and used, taking into account the trends in the development of different administrative and academic circles, as well as different structural organizations, such as NATO and the EU. [II.1.5, II.1.7, II.3.77, II.3.78, II.3.86, II.3.87, II.3.93, II.3.99, II.3.103, II.3.104]
- o Modeling of processes influencing the cyber security of information and communication systems. Those results are published in II.3.84, II.3.95, II.3.96, II.3.97, II.3.98, II.3.99, II.3.101, II.3.107, II.3.108, and II.3.110 and are tested in a number of research projects.
- o Research on cyber security in emerging and innovative system concepts and technologies. Those concepts and technologies are the subject of the publications submitted for review: Internet of Things and Internet of Military Things – II.3.83, II.3.91, Blockchain – II.3.102, situational awareness – II.3.106, II.3.109.

Here it must be emphasized that the obtained scientific and applied research results have been tested in the projects MAMA (departmental – MO), ECHO (international H2020), FORESIGHT (international H2020), CyRADARS (NATO SPS), CyNET (international – MES), CyberTwin (international – MES), PYTHIA (international PADR) and SOLOMON (international PADR), (Annex 2, section II.4).

In conclusion of this paragraph, I would like to draw attention to the fact that the results obtained, as well as the scientific, methodological and scientific-practical contributions of Assoc. Prof. N. Stoianov are essentially a qualitative enrichment of the existing knowledge, and his scientific achievements are successfully implemented in the field of defence and security.

The author's participation in obtaining the contributions in peer-reviewed scientific works is undeniable.

5. Assessment of the relevance of contributions to science and practice:

According to my modest assessment, the scientific researches of Assoc.Prof. N. Stoianov have a significant effect not only in Bulgarian security and defence, but in the security and defence of the North Atlantic Treaty Organization (NATO) as well. His scientific works are extremely well cited by world-famous authors and publications, as well as by specialists from military practice. (This fact is confirmed by the extremely rich Citations Reference).

The scientific researches of Assoc. Prof. Stoianov are of a complex nature. They contain theoretical generalizations and practical applications in risk management, defense and security.

The results can be applied to scientifically substantiate management decisions and corresponding activities in the field of defence and security.

The research of the candidate is theoretically significant and original in the theory and practice of the military field, technics and technology. They are practically useful and are applicable to solving current problems and tasks of defence and security.

I would like to emphasize that, as a whole, the submitted documentation fully corresponds to the stated claims.

6. Assessment of the extent to which the contributions are made by the applicant:

I have not noticed unauthorized plagiarism of other people's results and in this connection I claim that all contributions come from the personal work of the candidate or were received jointly and together with his co-authors.

7. Critical notes for peer-reviewed works:

I have no critical comments to the scientific papers submitted for review!

8. Personal impressions and other issues on which the reviewer considers that he should take a stand:

I have excellent personal impressions of the scientific development of Assoc. Prof. N. Stoianov for the last five (5) years, both as a leader and as a member of scientific teams and as a creative implementer. I am particularly impressed by his work on the preparation and implementation of the National Scientific Program "Security and Defence".

Assoc. Prof. N. Stoianov and I have discussed widely and in depth the materials presented in the competition. I affirmed that the candidate is an accomplished leader,

scientist and teacher. He develops his ideas creatively and is consistent in all his activities.

Colonel N. Stoianov combines his commanders' engagements with his public, scientific and teaching activities. He seeks forms for his continuous improvement and development and at the same time participates in solving local, regional and national priority tasks, as well as tasks of the Alliance.

I would work on future joint educational and scientific projects with Assoc. Prof. N. Stoianov both for security risk management and within the NSPSD.

9. Conclusion:

Associate Professor Nikolai Stoianov is a typical representative of the established and recognized scientific community at the Bulgarian Defence Institute, which is constantly developing in the recent years. With his research work and the training of seven (7) PhD students, two (2) of whom have successfully defended their theses, Colonel Stoianov contributes to this development.

The achievements of the candidate are relevant and significant.

Scientific and scientific-applied contributions are proof of the importance of his scientific work.

The presented publications in the competition are methodologically sound. The results are applicable in practice.

The candidate, Associate Professor Nikolai Stoianov, has in-depth theoretical knowledge and skills for their implementation. Through the conducted research, he proves his ability to solve significant scientific tasks independently.

The results of the candidate's activity are in accordance with the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the Rules for its implementation.

Based on everything set out above, **I PROPOSE:**

Col. Dr. Assoc. Prof. Nikolai Todorov Stoianov, to be elected to take the academic position of "Professor" in the Field of Higher Education 5. "Technical Sciences", Professional field 5.3. "Communication and Computer Technology".

10. Assessment of the applicant:

I give a positive assessment of the candidate!

I would like to share my real satisfaction in getting to know his scientific research.

12.01.2023

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