



MINISTRY OF DEFENSE

BULGARIAN DEFENSE INSTITUTE „PROF. TSVETAN LAZAROV”

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R E V I E W

By Prof. Valeri Velkov Ivanov, PhD

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on the scientific papers presented in the competition for the academic position of “Associated Professor”, in the field of higher education 5. Technical Sciences, professional area 5.5. Transport, shipping and aviation, scientific specialty “Design and construction of automatic and piloted aircraft”, for the needs of the “Development of weapons, equipment, logistics assets and materials“ directorate of the Bulgarian Defense Institute, promulgated in SG no. № 29 / 04.04.2025

for the candidate:

Chief Assistant Eng. Atanas Yordanov Ganchev, PhD,

Chief Assistant at the Bulgarian Defense Institute “Professor Tsvetan Lazarov”

Sofia

2025

1. General description of the submitted materials. Which works from those submitted by the candidate are accepted for evaluation by the reviewer

In connection with an announcement in the State Gazette No. 29 of 04.04.2025 on the competition announced by the Bulgarian Defense Institute “Prof. Tsvetan Lazarov” for the academic position of “Associate Professor” in the field of higher education 5. Technical Sciences, professional area 5.5. Transport, Shipping and Aviation, scientific specialty “Design and Construction of Automatic and Piloted Aircraft”, the documents of one candidate have been received - Chief Assistant Engineer Atanas Yordanov Ganchev, PhD, Chief Assistant at the Bulgarian Defense Institute.

From the documents submitted to me for participation in the competition and the scientific papers proposed for review by the candidate - Chief Assistant Dr. Atanas Ganchev, as well as from the additional materials submitted to me, I can summarize that the competition is organized in accordance with the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation, as well as the Regulations for the terms and conditions for holding academic positions at the Bulgarian Defense Institute.

To participate in the competition, Chief Asst. Dr. Eng. Ganchev applies the following documents: Personnel reference; Creative CV; Copy of diploma for acquired educational and scientific degree “Doctor”; Certificate-declaration for fulfillment of the minimum national requirements under Art. 2b, para. 2, para. 3 and para. 5 of the Act on Development of the Academic Staff in the Republic of Bulgaria, for holding the academic position of “Associate Professor”; List of scientific publications, scientific works and other scientific and applied scientific developments; Published monographic work; Scientific research works, publications, inventions and other scientific and applied scientific developments that do not repeat those submitted for the acquisition of the educational and scientific degree “Doctor”; Short summaries of scientific publications and other scientific developments; Reference for original scientific contributions; Copy of certificate of English language proficiency according to STANAG-6001; Copy of authorization

for access to classified information; Electronic media (CD) containing a record of the original documents, etc.

The total number of scientific publications submitted for review by the candidate Chief Assistant Dr. Eng. Ganchev is 14, the majority of which (13 issues in total) are completely independent author publications.

By their nature, the scientific publications submitted for review are: monographic work – 1; scientific reports – 13.

The analysis of the scientific works of Chief Asst. Dr. Eng. Ganchev shows that the candidate has worked extremely intensively over the last 5 years, purposefully and thoroughly researching various dimensions of aviation security, with a main focus on ornithological safety, revealing the risks, threats and dynamics of flight operation of the “Crew – Aircraft” system, and also explores various aspects of countering the threat of unmanned aerial vehicles in the context of their military, civil and commercial applications.

The quantitative characteristics of the scientific production of Chief Asst. Dr. Eng. Ganchev give me a reason to assert that the candidate for the academic position of “Associate Professor” meets the conditions of Art. 24, para. 1, respectively the requirements of Art. 2b, para. 5 of the Act on Development of the Academic Staff in the Republic of Bulgaria. The publications accepted for review do not repeat those that are included in the scientometric indicators for holding an academic position “Chief Assistant”.

From the attached Certificate of Compliance with the Minimum National Requirements, with supporting evidence, Appendix No. 9 to the Candidate's Application, it is evident that Chief Assistant Dr. Atanas Ganchev has fulfilled the minimum national requirements under Art. 2b, para. 2 and 3 of the Act on Development of the Academic Staff in the Republic of Bulgaria. Moreover, he covers and slightly exceeds the indicators from groups A to E, as with a minimum required number of 400 points, he collects a total of 468 points. The requirements of Art. 24, para. 5 of the Act on Development of the Academic Staff in the Republic of

Bulgaria have also been met - no plagiarism in the scientific works has been proven in accordance with the statutory procedure.

The candidate participates in the competition with 14 scientific papers and numerous scientific-applied and methodological developments, proposing 1 monograph and 13 scientific reports for review. I accept all 14 for evaluation, as I believe that they contain serious scientific and scientific-applied contributions.

2. General characteristics of the candidate's research, applied science and pedagogical activities

Scientific publications adapt and develop contemporary scientific and applied scientific achievements in the field of aviation security, representing further development and complementation of existing knowledge with analysis of models, strategies and methodologies.

In his monograph “Some Aspects of Flight Operations for Optimizing Ornithological Safety”, he examines a number of current aspects of aircraft flight safety, reveals the functional dependencies and interrelationships of the “Crew – Aircraft” system in order to minimize the negative impact on the aircraft from the bird strike.

Special attention is paid to the proposed methods for optimizing flight operations and the revealed approaches for increasing ornithological safety, which create conditions for reliable, safe and effective operation of aircraft. Ways are indicated for making forecasts regarding possible dangers, which are aimed at reducing the risk of bird strikes. Using a logical sequence in the presentation, the author presents modern understandings of the process of increasing the level of ornithological safety. The recommendations regarding some appropriate measures are consistent with national and European legislation on nature protection and the requirements for preserving the ecological balance.

The research conducted has an original character and depth of the presented analyses. The aviation system is considered as a complex, consisting of a significant number of subsystems, each of which in turn can be considered as a separate complex system. On this basis, some methods have been proposed for assessing the

quality characteristics of individual elements of the aircraft structure, from the point of view of searching for opportunities to increase the efficiency of flight operations.

Based on the selection of general and specific criteria or features, opportunities for optimization of the flight operation process have been identified and classified. The safety, efficiency, reliability and precision of the “Crew – Aircraft” system, the crew's operational workload and the response time have been analyzed as criteria of priority importance.

The presented monograph is an independent, in-depth scientific study that creates a basis for further expansion and deepening of analyses in a specific field of knowledge.

The remaining scientific works are distinguished by originality and depth of scientific research, which can be characterized as further adaptation and development of modern scientific and applied scientific achievements in the field of flight operations, ornithological safety and aviation security. They are dedicated to the study of various aspects and dimensions of the “Crew – Aircraft” system, the development of a methodology for determining the speed of penetration of structural elements, a methodology for determining the degree of impact of damage on the aircraft structure, resulting from a bird strike, as well as to assess the possibility of preventing an accident or catastrophe.

An important and specific area to which he has dedicated a significant part of his research is analyses related to the role, place and capabilities of unmanned aerial vehicles, their safe use both in modern military conflicts and in the civilian sphere. In this regard, the author proposes further development and complementation of existing knowledge with an analysis of capabilities, various technologies and strategies for countering the threat of unmanned aerial vehicles and some solutions for optimizing the capabilities for electronic countermeasures of unmanned aerial vehicles, which can be applied to minimize possible risks.

In general, the presented scientific works of the candidate Chief Assistant Dr. Atanas Ganchev can be grouped into **two thematic areas**:

- Research into the impact of ornithological safety on aircraft performance, assessment of the quality characteristics of aircraft structural elements and analysis of risks, threats and the impact of associated factors on flight operations and flight safety;

- Analysis of the role, place and possibilities for using unmanned aerial vehicles in modern military conflicts, as well as optimizing the possibilities for countering threats from their use in the civilian sphere.

In addition, the candidate, Chief Assistant Dr. Eng. Atanas Ganchev, has worked in a very specific scientific and applied field, related to the development of numerous educational and methodological works, of military-economic analyses, scientific and applied programs and methodologies for assessing the technical condition and determining the possibilities for extending the technical resource of aviation equipment, preparation of tactical and technical tasks, technical specifications, research projects for the selection and acquisition of military equipment for the needs of the Ministry of Defense, the Bulgarian Army and their subordinate structures, etc.

I believe that the candidate's scientific and research production and applied scientific activity submitted to me for review are directly related to the required qualification and scientific specialty from the announced competition.

3. Assessment of the candidate's special training and activities

Chief Asst. Dr. Eng. Atanas Yordanov Ganchev presents 14 scientific papers, including 1 author's monograph, 13 reports at international scientific conferences, of which 1 in co-authorship, as well as 21 citations.

The 14 scientific papers accepted for evaluation provide a clear idea of the candidate's good professional preparation and extensive research and applied activities in the field of his professional area and characterize him as a good researcher.

For the last 5 years, the author has participated in the development of 5 military-economic analyses, participated as a member of teams for the development and implementation of 7 national and international projects, developed 30 technical

specifications for various supplies, services and modernization of aviation equipment and 32 methodologies and programs for testing aviation equipment, in order to assess the technical condition and determining the possibility of extending the total technical and inter-repair resource of aviation equipment. Their quantity and thematic diversity present the candidate as a highly qualified expert in the field of aviation equipment and flight safety, with significant knowledge and skills in scientific and applied research and development, both for the Bulgarian Defense Institute, and within the armed forces and in the structures directly subordinate to the Minister of Defense.

The above, as well as the characteristics of the scientific research and applied scientific activities of Chief Assistant Dr. Ganchev, give me reason to assert that **the candidate has the necessary scientific research training and good special qualifications, which correspond to the professional area and scientific specialty** specified in the competition.

4. Main scientific results and contributions

The main contributions of the candidate, in my opinion, are reduced to conducting research in which he systematizes, summarizes and further develops the theory, achieving visible results of a scientific and scientifically applied nature. The candidate's works are cited by the scientific community due to the achieved balance between practical and theoretical results.

I accept as logical and defensible the candidate's claims for scientific and applied scientific contributions, declared in the attached reference, although poorly systematized.

I distinguish the following **scientific contributions in thematic area No. 1** (monograph: “Some aspects of flight operations for optimizing ornithological safety”, reports - 6 issues):

- A comprehensive multidisciplinary study has been conducted and the cause-and-effect relationships and dependencies in the “Crew – Aircraft” system have been revealed, the possibilities for overcoming emerging problems related to the ornithological safety of aircraft flights have been systematized and indicated;

- Scientific results have been systematized, existing theories and concepts regarding aviation security and aircraft flight operations have been further developed, and basic principles, approaches and effective models for reducing risks and achieving a high level of flight safety have been defined;

- New knowledge in the field of ornithological safety has been systematized and approaches have been revealed to reduce the risk of bird strikes and create conditions for reliable, safe and effective operation of aircraft.

The scientific and applied contributions in thematic area No. 1 are:

- Methods for optimizing flight operations have been proposed and some approaches for increasing ornithological safety have been revealed, which create conditions for reliable, safe and effective operation of aircraft;

- Ways are indicated for making predictions about possible dangers aimed at reducing the risk of collisions with birds, recommendations are presented regarding some appropriate measures, consistent with national and European legislation for nature protection and the requirements for preserving the ecological balance.

I also distinguish the following **scientific contributions in thematic area No. 2** (reports – 7 issues):

- The role, place and capabilities of unmanned aerial vehicles have been studied and the existing knowledge about their safe use has been supplemented, both in modern military conflicts and in the civilian sphere;

- An analysis of the risks and threats, development guidelines and opportunities for effective counteraction to the threat of unmanned aerial vehicles has been carried out.

Scientific and applied contributions in thematic area No. 2 that I distinguish are:

- Various approaches, technologies and strategies have been developed to optimize the capabilities for electronic countermeasures of unmanned aerial vehicles, which can be applied to minimize possible security risks;

- A methodological framework has been developed for methodologically ensuring the procedures for effective management of the level of safety of combat

flights, which includes technologies, algorithms and programs, based on objective measurement/quantitative assessment.

The analysis of the scientific production proposed to me for review and the results obtained create the feeling in me that **it is about depth and originality in scientific interests and for this reason I accept that they are the personal work of the candidate.**

5. Assessment of the significance of contributions to science and practice

The above-mentioned scientific and applied scientific contributions of the candidate are important for the development of professional area 5.5. Transport, shipping and aviation. In essence, they are a further development of the theory and practice of ensuring aviation safety.

In my opinion, the most significant part of them is related to enriching existing knowledge in the field of aviation security and flight safety, adapting theory and practice related to ornithological safety of airports and reducing the risk of collisions with birds of aircraft, synthesizing new knowledge to increase the efficiency of flight operations and aviation security risk management, including reducing the threat from unmanned aerial vehicles.

The candidate has promoted and presented the results of his research at a number international scientific forums in Bulgaria.

6. Critical notes

At the very beginning, it is striking that the candidate has presented a large number of publications, but in fact these are only reports at scientific conferences and **not a single scientific article in a scientific journal**, both in our country and abroad.

Given the scientific and applied scientific results obtained, I recommend that Chief Assistant Dr. Ganchev increase the applied part of the research, and also continue to promote the results of his research more.

7. Conclusion

The analysis of the presented scientific production and the attached references, tables, creative CV and other documents allows us to conclude that the candidate is a fully accomplished researcher and an active participant in the research, development and innovation activities of the Institute.

The submitted works have a clearly expressed thematic focus, correspond to the scientific field in which the competition is announced, directly correspond to the scientific specialty and meet the regulatory requirements.

10. Evaluation of candidates

Considering the above and the significant scientific and applied scientific results in the scientific production of Chief Asst. Eng. Atanas Yordanov Ganchev, PhD, the only participant in the competition for the academic position of “Associate Professor”, **I give my positive assessment** and recommend to the esteemed Scientific Jury to select Chief Asst. Eng. Atanas Yordanov Ganchev, PhD to occupy the academic position of “Associate Professor” at the Bulgarian Defense Institute “Prof. Tsvetan Lazarov”, field of higher education 5. Technical Sciences, professional area 5.5. Transport, Shipping and Aviation, scientific specialty “Design and Construction of Automatic and Piloted Aircraft”.

Member of the scientific jury:

04.06.2025

Professor, PhD

Valeri Ivanov