



## **МИНИСТЕРСТВО НА ОТБРАНАТА**

### **ИНСТИТУТ ПО ОТБРАНА „ПРОФЕСОР ЦВЕТАН ЛАЗАРОВ”**

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

## **EVALUATION REPORT**

by Assoc. Prof. Dr. Eng. Kolyo Penchev Kolev,

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**Regarding** the competition for the academic position of *Associate Professor* in the higher education field 5. *Technical Sciences*, professional field 5.5. *Transport, Shipping, and Aviation*, scientific specialty *Design and Construction of Automatic and Piloted Aircraft*,

with Dr. Eng. Atanas Yordanov Ganchev,

Chief Assistant Professor at the Defence Institute "Prof. Tsvetan Lazarov"

### **1. GENERAL DESCRIPTION OF THE SUBMITTED MATERIALS**

Based on a published announcement in the *State Gazette*, issue no. 29 of 04.04.2025, for a competition for the academic position of *Associate Professor* in the higher education field 5. *Technical Sciences*, professional field 5.5. *Transport, Shipping, and Aviation*, and pursuant to Order No. 285/13.05.2025 of the Director of the Defence Institute "Prof. Tsvetan Lazarov", the documents of one candidate have

been submitted – Chief Assistant Professor Dr. Eng. Atanas Yordanov Ganchev, employed at the Defence Institute.

Along with his application for participation in the competition, Dr. Eng. Ganchev submitted the following documents:

- Personnel report;
- Creative CV;
- Copy of diploma for educational qualification degree "Master";
- Copy of diploma for educational and scientific degree "Doctor";
- Report-declaration for meeting the minimum national requirements under Art. 2b, para. 2, 3, and 5 of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA) for the academic position of *Associate Professor*;
- List of scientific publications, research papers, and other scientific and applied developments;
- Published monograph;
- Research papers, publications, inventions, and other scientific and applicable developments not used in acquiring the "Doctor" degree;
- Short abstracts of scientific publications and papers in Bulgarian and English;
- Report on original scientific contributions;
- Copy of documents from the most recent attestation;
- Copy of English language proficiency certificate (STANAG-6001);
- Copy of clearance for access to classified information.

The scientific works submitted by the candidate for the competition may be classified, in accordance with Table 1 (DASRBA and its implementing regulations), as follows:

**1.1. Indicator A** – 1 dissertation for acquiring the degree "Doctor" and 4 papers related to the dissertation, none of which are proposed for review – **50 points**.

**Works proposed for review:**

**1.2. Indicator B.3** – 1 monographic work – **100 points**.

**1.4. Indicator G.8** – 13 articles and reports in non-refereed journals with scientific peer review or in edited collective volumes (12 as sole author, 1 as co-author) – **245 points**.

**1.5. Indicator D** – 21 citations totaling **63 points**, distributed as follows:

- **D.14** – 21 citations in non-refereed peer-reviewed publications – **63 points**.

**1.6. Indicator E** – 6 items – **10 points**, including:

- **E.18** – 1 national project, 4 projects for the Ministry of Defence, 1 for the Defence Institute – **10 points**.

The scientific works submitted by the candidate meet all the established requirements and demonstrate significant scientific, applied scientific, and practical contributions. They reflect a high level of academic competence and contributions to the relevant scientific field.

## **2. OVERALL CHARACTERISTICS OF THE CANDIDATE'S RESEARCH AND APPLIED ACTIVITIES**

Dr. Atanas Yordanov Ganchev has consistently held the following academic positions:

- Chief Assistant in the Department "Armaments and Ammunition", Directorate "Development of Armament, Equipment, and Logistics" at the Defence Institute "Prof. Tsvetan Lazarov";

- Chief Assistant in the Department "Research and Analysis in Security and Defence" at the same institute.

In 1983, he graduated from the Higher Air Force School "Georgi Benkovski", Dolna Mitropoliya, with a Bachelor's degree in *Operation and Maintenance of Aircraft*.

In 1998, he graduated from the "G. S. Rakovski" Military Academy with a Master's degree in *Operational and Tactical Command – Air Force*. In 2018, he defended a dissertation for the degree of "Doctor" at the Defence Institute "Prof. Tsvetan Lazarov" in the scientific specialty *Dynamics, Ballistics, and Flight Control of Aircraft*, in field 5. *Technical Sciences*, professional direction 5.1. *Mechanical Engineering*, with the topic: *Minimizing the Adverse Effects of Bird Strikes on Aircraft*.

His main scientific, research, and applied activities are in professional field 5.5. *Transport, Shipping, and Aviation*, focusing on the aerodynamic characteristics of aircraft and components, and their influence on flight dynamics, stability, and control.

The scientific work of the candidate can be classified into the following areas:

**1. Ornithological Safety:**

- Aircraft design and structural integrity;
- Powerplant structure and strength;
- Aircraft control systems;
- Bird control measures near airports;
- Crew actions to prevent bird strikes;
- Optimization of the "crew-aircraft" operational system to enhance flight safety.

**2. Unmanned Aerial Vehicles (UAVs):** Operational characteristics, combat capabilities, navigation, communication, and logistics.

**3. Materials Science:** Study of the strength characteristics of aircraft structural components.

4. **Functional Characteristics:** Of systems, units, and elements of aircraft.

5. **Dynamic Interaction and Modeling of Bird Strikes on Aircraft.**

From the analysis of the scientific, research, applied, and teaching activities, it can be concluded that the candidate has worked and continues to work in the field of 5.5. *Transport, Shipping, and Aviation*. His research and applied activities have contributed to his development as a specialist.

The submitted scientific and research output and applied activities are directly related to the announced competition.

**3. ASSESSMENT OF THE CANDIDATE'S SPECIALIZED TRAINING AND ACTIVITIES**

The reviewed scientific works provide a clear picture of the candidate's strong preparation and scientific research and applied activities in the relevant professional field, characterizing him as a competent researcher.

Of the 13 submitted works and scientific publications, he is the sole author of 12 and co-author of 1.

Based on the submitted scientific publications, I conclude that Chief Assistant Ganchev has the required research experience and possesses strong specialized and methodological skills.

**4. MAIN SCIENTIFIC RESULTS AND CONTRIBUTIONS**

In the monograph "*Certain Aspects of Flight Operation for Optimizing Ornithological Safety*", Defence Institute, Ministry of Defence, Sofia, 2025, ISBN 978-619-90024-9-0, a set of approaches is proposed for improving bird strike safety, contributing to the reliable, safe, and efficient operation of aircraft. It outlines methods for forecasting potential hazards and minimizing bird strike risks.

The aviation system is considered a complex structure comprising numerous subsystems, each of which can be viewed as a complex system in its own right. The

subsystem “crew – aircraft” is identified as a core component. The key factors influencing the subject are systematically and convincingly identified and articulated.

The scientific works developed are characterized by scientific, applied scientific, and practical contributions, enriching and further developing the knowledge in field 5.5. *Transport, Shipping, and Aviation*.

The candidate meets the minimum required scores across the indicators for the academic position of *Associate Professor* in field 5. *Technical Sciences, 5.5. Transport, Shipping, and Aviation*, according to Table 1 (DASRBA and its implementing regulations). His scientometric indicators meet the requirements of DASRBA and its regulations.

Indicator Group	Indicators	Requirements for Academic Position "Associate Professor"	Candidate's Points
A	Indicator 1	50	<b>50</b>
C	Indicator 3	100	<b>100</b>
D	Sum of Indicators from 5 to 11	200	<b>245</b>
E	Sum of Indicators from 12 to 15	50	<b>63</b>
F	Sum of Indicators 16 and beyond	-	<b>10</b>
$\Sigma$		400	<b>468</b>

**The analysis of the studies presented in the publications reveals a significant degree of originality and depth. The obtained scientific results and contributions are largely the personal achievement of the candidate.**

## **5. SIGNIFICANCE AND APPLICATION OF CONTRIBUTIONS**

The presented original scientific contributions focus on the interdisciplinary study of the interaction between aviation and ornithological species, with an emphasis on managing the risk of collisions between aircraft (AC) and birds, as well as the use of modern technologies, including unmanned aerial vehicles (UAVs), for monitoring and prevention. Predictive models have been developed for mapping risk zones in airport complexes. By integrating GIS technologies with ornithological databases, a geospatial analysis has been conducted, enabling the identification of “hot spots” of risk. An educational guideline for aviation personnel has also been proposed, aimed at raising awareness of ornithological threats.

The technical, legal, and ethical aspects of UAV use have been analyzed, highlighting the multifunctional nature of their operational deployment and the associated “dual-use” technologies.

The presented scientific contributions reveal potential for publication and further development in a wide range of scientific areas, including aerodynamics, aviation safety, automation and artificial intelligence, as well as sustainable risk management and military technologies.

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

The level of the achieved results fully meets the requirements of the Development of the Academic Staff in the Republic of Bulgaria Act (DASRBA) and its Implementing Regulations.

## **6. CRITICAL REMARKS**

In light of the obtained scientific and applied results, I recommend that the candidate increase the applied aspect of his research and continue to more actively promote his research findings internationally.

## **7. CONCLUSION**

The candidate, Dr. Ganchev, possesses in-depth knowledge and a creative approach in the field of professional area 5.5. “Transport, Navigation, and Aviation” and has a solid specialized training.

Based on the scientific results and contributions in the candidate’s works, I propose that the Scientific Jury elect Chief Assistant Professor Dr. Eng. Atanas Jordanov Ganchev to the academic position of **Associate Professor** at the Defence Institute “Professor Tsvetan Lazarov” in the professional field 5.5. “Transport, Navigation, and Aviation,” within the higher education area 5. “Technical Sciences”.

**Assoc. Prof. Dr. Eng. /signed/ Kolev**

**June 4, 2025**