

OPINION

of Assoc. Prof. Hristo Todorov Ibrishimov, PhD, Technical University of Gabrovo, regarding the materials submitted for participation in a competition for the academic position of "Associate Professor" in the Field of Higher Education - 5. Technical sciences, Professional Field - 5.2. Electrical Engineering, Electronics and Automation, scientific subject – “Electric Power Distribution and Electrical Equipment”

In the competition for associate professor, announced in the Official Gazette, issue 48 from 13.06.2025 and on the website of the Technical University - Gabrovo for the needs of the Department “Electric Power Distribution and Electrical Equipment”, as the only candidate involved Chief Assistant Lubomir Diyanov Dimitrov, PhD Eng.

1. Overview of the content and results in the presented works

For participation in the competition for the academic position of “Associate Professor”, Chief Assistant Professor Lyubomir Dimitrov has submitted a Ph.D. diploma, an abstract of the dissertation, a list of 37 publications, information on registered citations, published textbooks, a list of courses taught, and evidence of participation in research projects.

In the competition for the academic position of Associate Professor, the candidate participates with publications equivalent in scope and content to a monograph. A total of 10 publications indexed in international databases Scopus and Web of Science have been presented. The publications are within the scientific field of the competition, and the total number of points in the group is 142. A total of 27 scientific publications, in addition to those equivalent to a monograph, have been presented, 2 of which are indexed in the international databases Scopus and Web of Science. The total number of points in Group G_e is 246.47 (with a minimum requirement of 200 points). A report of 24 registered citations indexed in Scopus and Web of Science has also been submitted. The total number of points in Group D is 240 (with a minimum requirement of 50 points). Additionally, evidence of participation in 15 research projects has been presented, including 1 externally funded project, 2 projects under the Operational Programme “Science and Education for Smart Growth”, and 12 internal projects of the Technical University of Gabrovo. The candidate is the project leader of one externally funded project implemented in partnership with “ACDC Energy” Ltd., Sofia. The candidate’s research and scientific-applied work is focused on the mathematical and electromechanical modeling of induction electrical machines, the reduction of losses in induction drives through adaptive control and optimization of rotational speed, and the application of frequency control methods to improve energy efficiency. The research further encompasses the analysis of the influence of mechanical loading and parameter variations on the dynamic behavior of electric motors, as well as the extension of these studies to electric-vehicle applications and electric mobility. Additional areas of contribution include the examination of power quality, harmonic distortion, and nonlinear electrical loads, together with the implementation of modern methods for monitoring and data processing in electrical energy systems.

The quantitative indicators of the criteria for holding the academic position of “Associate Professor” have been met, in accordance with the Regulations for the Acquisition of Scientific Degrees and Holding of Academic Positions at the Technical University of Gabrovo.

2. General characteristics of the candidate's activity

2.1. Educational and pedagogical activity

The candidate for the academic position of “Associate Professor,” Chief Assistant Professor Dr. Eng. Lyubomir Dimitrov, was appointed as an Assistant Professor at the Technical University of Gabrovo in 2010. In 2016, he was promoted to the position of Chief Assistant Professor in the Department of Electrical Supply and Electrical Equipment at the same university.

He has delivered lectures, laboratory exercises, and seminar sessions to full-time and part-time students in the following Bachelor’s degree courses: Electrical Equipment, Electrical Equipment of Production Machines and Processes, Relay Protection, and Operation of Automatic Devices and Systems; as well as in Master’s degree courses: Electrical Equipment, Electrical Equipment of Production Machines and Processes, and Electrical Equipment of Automated and Robotic Devices.

The candidate is a co-author of the curricula for the following disciplines: Electrical Equipment, Electrical Equipment of Production Machines and Processes, Electrical Equipment of Automated and Robotic Devices, and Electric Vehicles.

According to the submitted list, Dr. Eng. Dimitrov is a co-author of two textbooks intended for Bachelor’s and Master’s degree students. During his many years of teaching under his leadership, 80 graduates have successfully defended.

2.2. Scientific and scientific-applied activity

Chief Assistant Professor Lyubomir Dimitrov has participated in 15 research projects funded by the national budget, the Operational Programme “Science and Education for Smart Growth”, and through an externally funded project with “ACDC Energy” Ltd., Sofia, for which he serves as the project leader.

2.3. Implementation activities

No documents have been submitted regarding implementation activities. However, the results of Chief Assistant Professor Dimitrov’s applied and implementation work have been incorporated into the educational process through the development of laboratory test benches and the establishment of two teaching laboratories.

3. Contributions (Scientific, Scientific-Applied, and Applied) Significance of the Contributions for Science and Practice

I accept in essence the contributions formulated by the candidate; in my opinion, they may be presented as follows:

I. Scientific Contributions

- An electromechanical model of an induction electric drive with a squirrel-cage rotor for high-voltage applications has been developed. The model describes the physical relationships between the electrical and mechanical parameters of the system and enables analysis of various operating modes.
- A computational mathematical model for evaluating electrical and mechanical losses in drive motors has been created, allowing detailed analysis of the individual components and energy flows under different loading and operational conditions.
- The behavior of a new type of traction direct-current motor intended for driving electric vehicles has been investigated. The study identifies the dependencies between design and operational parameters and their effect on the overall system efficiency.

II. Scientific-Applied Contributions

- Comprehensive characteristics of electric vehicles and their main components have been obtained based on experimental and analytical studies of their operational functionality.
- Experimental research and verification of an energy-efficient three-phase induction motor have been conducted, establishing correlations between design modifications, load conditions, and overall energy efficiency.
- An energy-efficient solution for improving the performance of electrical machines and mechanisms in industrial electrical systems has been developed through the application of frequency control and optimization of operating regimes.

III. Applied Contributions

- Practical measurements and analyses of electric power quality have been carried out during the operation of various types of electrical loads.
- Comprehensive evaluation and summarization of the obtained measurement results have been performed, providing insight into the relationships between load characteristics, power quality parameters, and overall performance of electrical systems.

4. Assessment of the Candidate's Personal Contribution

I consider the contributions to be the personal work of the candidate. Chief Assistant Professor Lyubomir Dimitrov is a researcher and lecturer with over 15 years of professional experience, whose scientific work is directly related to the thematic scope of the competition.

After reviewing and analyzing his research developments and achievements, as well as the materials submitted for participation in the competition — namely 37 publications in scientific journals and conference proceedings, including 5 single-authored works and 7 publications where the candidate is the first author — I conclude that the candidate has demonstrated sufficient personal contribution and a leading role in the presented research outputs.

5. Critical Remarks and Recommendations

I have no substantial critical comments regarding the materials submitted by the candidate. Nevertheless, the following observations and recommendations may be made:

1. In the citation report, seven self-citations have been included, which has led to an incorrect calculation of the total number of points under Criterion D (240 points). The correct value should be 170 points, resulting in a total of 608.37 points across all evaluation criteria.
2. It is recommended that the candidate broaden his participation in additional scientific conferences and journals with an impact factor, in order to further enhance the visibility and international recognition of his research work.

6. Personal Impressions

I have known Chief Assistant Professor Dr. Eng. Lyubomir Dimitrov as a colleague with whom I have worked in the Department of Electrical Supply and Electrical Equipment at the Technical University of Gabrovo since 2014. He is distinguished by his independence, diligence, and initiative in both his academic and research activities.

7. Conclusion

Taking into consideration all of the above, I propose to the esteemed scientific jury that Chief Assistant Professor Dr. Eng. Lyubomir Diyanov Dimitrov be elected to the academic position of “Associate Professor” in the field of higher education 5. Technical Sciences, in the

**professional field 5.2. Electrical Engineering, Electronics and Automation, specialty
“Electrical Supply and Electrical Equipment.”**

08.11.2025 г.

Member of the jury: /signature/
/Assoc. Prof. Hristo Todorov Ibrishimov /