

R E V I E W

by Prof. Ivaylo Stefanov Stoyanov, PhD – Ruse University ‘Angel Kanchev’

of the materials submitted for participation in the competition for the academic position of ‘Associate Professor’ in the field of higher education: 5. Technical Sciences, professional direction: 5.2. Electrical Engineering, Electronics and Automation, specialty ‘Electric Power Supply and Equipment’

In the competition for ‘Associate Professor’, announced in the State Gazette, issue 48/13.06.2025 and on the website of the Technical University - Gabrovo for the needs of the Department of Electric Power Supply and Equipment, the candidate is Chief Assistant Lyubomir Diyanov Dimitrov, PhD.

1. Brief biographical data

Chief Assistant Lyubomir Diyanov Dimitrov, PhD was born on 21 February 1984. He obtained his Bachelor's degree in 2007 at Technical University – Gabrovo with qualification ‘Electrical Engineer’, majoring in ‘Electric Power Energetics and Electrical Equipment”, and his Master's degree in 2009 at Technical University - Sofia with the same major, and during the period 2009-2011 he obtained a master's degree in ‘Occupational Safety’.

Chief Assistant Lyubomir Diyanov Dimitrov, PhD continues his education as a doctoral student at Technical University - Gabrovo. Since 2010, he has been working at the Technical University – Gabrovo, holding various positions – from 2010 to 2014 he held the academic position of ‘Assistant’, and from 2014-2016 the position of ‘Electrical equipment engineer’ at the Technical University – Gabrovo. In 2015, he acquired the educational and scientific degree ‘PhD’, and from 16 December 2016, after a competition, he held the academic position of ‘Chief Assistant’ in the Department of Electric Power Supply and Equipment at the Technical University – Gabrovo, where he currently works.

The candidate has constantly improved his qualifications during his education and work experience. I find evidence of this in the presented certificates and diplomas in a number of courses such as English Language Course, Entrepreneurship Course, Autodesk AutoCAD Electrical 2017 Course, EU-funded Project Development and Management Course, etc.

Chief Assistant Lyubomir Diyanov Dimitrov, PhD is a member of the ‘Territorial Organization of Scientific and Technical Unions - Gabrovo’ and the ‘Chamber of Engineers in Investment Design’. He is fluent in English and Russian.

2. General description of the materials submitted

Chief Assistant Lyubomir Diyanov Dimitrov, PhD participated in the competition for the academic position of ‘Associate Professor’, having submitted for review a total of 37 scientific papers, including 10 scientific publications in refereed and SCOPUS-indexed journals, replacing a monograph in accordance with Art. 29 paragraph 1, item 3 of the Law on the Development of the Academic Staff in the Republic of Bulgaria. A list of 1 textbook and 1 teaching aid is presented. A list of 2 national educational projects and 1 applied science contract with an external contractor and 14 research contracts with the Scientific Research Sector of the Technical University – Gabrovo is attached.

I accept official notes certifying participation and management of a scientific-applied contract, and scientific research developments, developed curricula, lectures given, educational activities, etc. I note and report, but do not review, the teaching aids that are reviewed before their publication.

Chief Assistant Lyubomir Diyanov Dimitrov, PhD has attached the following documents for participation in the competition: 1. Minimum required points by indicator groups for occupying the position of 'Associate Professor'; 2. Reference of fulfillment of the minimum national requirements and the additional requirements of the Technical University - Gabrovo in the scientific field 5. Technical Sciences and professional direction 5.2. Electrical Engineering, Electronics and Automation; 3. Reference to the scientific papers proving the points in indicator group 'V'; 4. Reference to the scientific papers proving the points in indicator group 'G'; 5. Reference to quotations proving the points in indicator group 'D'; 6. Author reference of contributions in scientific papers; 7. List of publications for participation in the competition; 8. List of publications submitted for the educational and scientific degree 'PhD'; 9. Copies of the publications; 10. Reference for quotations known; 11. Author's reference for contributions in scientific papers; 12. Reference of fulfillment of the minimum requirements (Annex 2.5 of the Regulations for the Acquisition of Scientific Degrees and Holding Academic Positions at the Technical University - Gabrovo); 13. Reference for implementation of the National Scientometric Data (Annex 2.4 of the Regulations for the Acquisition of Scientific Degrees and Holding Academic Positions at the Technical University - Gabrovo); 14. Abstracts of publications submitted for participation in the competition; 15. List of other scientific achievements; 16. Membership in organizations; 17. Reference for leadership and participation in national, scientific and educational projects and contracts; 18. Auditory occupancy reference for the number of lecturers for the last 4 academic years in Bulgarian universities accredited by the National Agency for Evaluation and Accreditation; 19. Copies of the published textbooks. 20. Declaration of authenticity of the information provided.

The table below is based on the submitted documents, publications and teaching aids, as well as information on the fulfillment of the minimum national requirements and those of the Regulations for the acquisition of scientific degrees and holding academic positions at the Technical University - Gabrovo, presenting the distribution by groups and indicators.

Group/Min. required points from Law on the Development of the Academic Staff in the Republic of Bulgaria	Indicators	Candidate points
A/50	Indicator 1	50
	A.1. Dissertation for the award of the educational and scientific degree 'PhD' – Diploma No.29222 of 23 July 2004	50
V/100	Indicator 4	142
	B.4. Habilitation thesis – 10 scientific publications in refereed and SCOPUS-indexed journals	142

Group/Min. required points from Law on the Development of the Academic Staff in the Republic of Bulgaria	Indicators	Candidate points
G/200	Sum of indicators 7 to 8	246.37
	G.7. Scientific publications in journals that are refereed and indexed in SCOPUS – 2 pcs.	21.33
	G.8. Scientific publications in non-refereed journals with scientific review or in edited collective works – 25 pcs.	225.04
D/100	Sum of indicators 12 to 14	240
	D.12. Quotations in scientific publications, refereed and indexed in SCOPUS – 24 issues x 10 points	240
E/-	Sum of indicators 18 to 24	50.82
	E.18. Participation in national scientific and/or educational projects – 2 x 10 points	20
	E.22. Funds raised for projects led by the candidate – x1 point for 5,000 BGN.	4.12
	E.23. Published university textbook – 1 issue	20
	E.24. Published university learning activity tool – 1 issue	6.7
	Total points:	679.19

There is an overfulfillment of all groups of indicators of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the Acquisition of Scientific Degrees and Holding Academic Positions of the Technical University – Gabrovo for holding the academic position of ‘Associate Professor’, as the candidate presents in his documents 4 independent publications and two publications with SJR (Scopus). The total number of points of Chief Assistant Lyubomir Diyanov Dimitrov, PhD is 679 points, with a requirement of 400 points.

I group the presented scientific papers as follows:

A) Scientific publications replacing habilitation work, which are referenced and indexed in world-renowned databases of scientific information – 10 issues. All are referenced in SCOPUS (V.4-1 ÷ V.4-10.);

B) Scientific publications that study the electric drive of electric vehicles, the losses of electrical energy of the electric motor driving a compact electric vehicle when changing the parameters and loads and their associated components, etc. [G.7.1, G.8.12, G.8.13, G.8.16, G.8.17];

C) Scientific publications related to research and development of models for increasing the energy efficiency of power electrical equipment through the application of frequency control and models have been developed for assessing the electrical losses occurring in the drive motors, as

well as the individual components and energy losses under different operating conditions of the electric drive, as well as criteria for assessing the influence of the quality of electrical energy on the dynamic behavior of induction motors. [V.4.6, V.4.7, G.8.5, G.8.5, G.8.14, G.8.15, G.8.20, G.8.21].

D) Scientific publications related to studies of the operational behavior of squirrel-cage induction motors. Publications in this thematic area cover the development of models and studies of operating modes of high-voltage squirrel-cage induction motor electric drives on the effects of non-nominal conditions, virtual measuring instruments, electromagnetic compatibility, electric vehicles, technological processes, etc. [V.4.1, V.4.2, V.4.3, V.4.5, G.8.1, G.8.4, G.8.5, G.8.8, G.8.9, G.8.10].

E) Scientific publications related to studies of the change in characteristic electrical quantities of electrotechnical facilities and objects. Publications in this thematic area cover studies on the change in characteristic electrical quantities of electrotechnical facilities and objects and their impact on power transformers supplying combined nonlinear loads in the public sector [V.4.8, G.7.2, G.8.7, G.8.11, G.8.15, G.8.18].

3. Reflection of the candidate's scientific publications in the scientific community (known quotations)

Chief Assistant Lyubomir Diyanov Dimitrov, PhD has presented information about 24 quotations in scientific publications that are referenced and indexed in world-renowned databases Scopus, IEEE – indicator ‘D.12’ with an equivalent of 240 points with a minimum required of 50 points. According to a SCOPUS search as of 30 October 2025, Chief Assistant Lyubomir Diyanov Dimitrov, PhD participated as a co-author in a total of 13 scientific papers with 43 quotations by Bulgarian and foreign scientists. His h-index is 4. These facts give me reason to conclude that the achievements of his research activities have become widely accessible to the scientific community in the country and abroad.

4. Overview of the content and results in the presented papers

The scientific papers submitted to me for review by Chief Assistant Lyubomir Diyanov Dimitrov, PhD can be categorized into the following thematic areas, which are covered in the individual publications:

Thematic area I. Studies of the behavior and characteristics of electric vehicles and their associated components. Scientific works in this topic area present research, analysis and conclusions on the electric drive of electric vehicles when changing parameters and loads [V.4.4, V.4.9, G.7.1]. The behavior of a new type of traction DC motor for driving electric vehicles has been studied [G.8.12, G.8.13]. An analysis of the current situation and trends in electric vehicle charging stations related to the development of electric mobility in Europe and Bulgaria has been carried out [G.8.16, G.8.17].

Thematic area II. Studies of electrical equipment units, machines and mechanisms. Publications in this thematic area present studies of various types of electrical units, machines and mechanisms with the aim of increasing the energy efficiency of a ventilation system by applying frequency control [V.4.6, V.4.7]. Computer mathematical modeling has been performed to evaluate the electrical losses occurring in the drive motors, as well as the individual components and energy losses under different operating conditions of the electric drive [G.8.5,

G.8.5, G.8.14]. The changes in electrical quantities during the operation of an electric hoist have been analyzed [G.8.15, G.8.20, G.8.21].

Thematic area III. Studies of the operational behavior of induction motors with a squirrel-cage rotor. The operational behavior of induction motors with a squirrel-cage rotor has been studied. An electromechanical model has been made and operating modes of an electric drive with an induction motor with a squirrel-cage rotor for high voltage have been presented [V.4.1, V.4.2, V.4.3, V.4.5, G.8.1]. Studies related to the influence of the resistive torque and supply voltage on the operation of a high-voltage induction motor for driving a pumping unit [G.8.4, G.8.5, G.8.8, G.8.9, G.8.10].

Thematic area IV. Studies on the change of characteristic electrical quantities of electrotechnical facilities and objects [V.4.8, G.7.2]. An analysis of the operating modes and energy-efficient practices in the operation of industrial induction furnaces with mains and medium frequency has been carried out [G.8.7, G.8.11] and the impact on the power system has been assessed [G.8.15, G.8.18].

Thematic area V. Practical measurements with digital measuring equipment. Publications in this thematic area cover practical measurements and analyses of the data obtained for the operation in operational conditions of a public facility, borehole pumps, frequency-controlled asynchronous motors, industrial compressor systems, etc. [G.8.22, G.8.23, G.8.24, G.8.25].

All submitted papers for participation in the competition for the academic position of 'Associate Professor' meet the topic of the competition and are accepted for review.

5. General description of the candidate's activity

5.1. Teaching and pedagogical activity

Chief Assistant Lyubomir Diyanov Dimitrov, PhD has many years of teaching experience with active teaching and pedagogical activity. He is a co-author of teaching teams that have developed curricula in the subjects 'Electrical Equipment', 'Electrical Equipment of Production Machines and Processes', 'Electrical Vehicles', 'Electrical Power Supply - Course Project', 'Electrical Equipment - Course Project', 'Electrical Equipment of Automated and Robotic Devices'.

According to the submitted reference, his annual study load is as follows for the academic year 2021/2022 - 834 hours; 2022/2023 - 732 hours; 2023/2024 - 658 hours; 2024/2025 - 507 hours. For the specified period, the candidate is the holder of subjects included in the curriculum of the specialty 'Electrical Power Engineering and Electrical Equipment' and has lectured and led exercises in 4 subjects from the bachelor's course and 3 disciplines from master's programs. He participated in the construction of 2 training laboratories: 1. Laboratory for 'Electrical Equipment'; 2. Laboratory for 'Exploitation of Automatic Devices and Systems'. He actively participates in research activities in teams with students and doctoral students in the Department of Electric Power Supply and Equipment. The candidate is a co-author in the development of a textbook on 'Electrical Drive and Electrical Equipment' and a teaching aid on 'Electrical Equipment', which are used to support teaching activities in the main studied subjects in the curricula of 'Electrical Power Engineering and Electrical Equipment' and 'Heating, ventilation, air conditioning and gas equipment' specialties. In his teaching and pedagogical activities, Chief Assistant Lyubomir Diyanov Dimitrov, PhD uses various specialized software tools for simulation modeling, software development and documentation. He has competence in working

with AutoCAD, AutoCAD Electrical, Ecodial, ABB (Doc), Simaris, Siemens – SIMATIC STEP 7 (TIA Portal), Moeller Easy Soft, OMRON software, Yaskawa software, CorelDRAW and others. His main interests are related to the study of processes in the electric drive of electric vehicles, energy efficiency, mathematical statistics, optimization and analysis in power supply and electrical equipment, etc. All of them are used in carrying out his educational and pedagogical activities with students.

5.2. Scientific and scientific-applied activities

The research and publication activity of Chief Assistant Lyubomir Diyanov Dimitrov, PhD includes 37 publications and 1 textbook and 1 teaching aid, covering a wide range of international forums in the country and abroad. Among the more significant of them are ICATE 2018, BuLEF 2021, CIEES 2022, CIEES 2023, EEPES 2023, EE&AE2020, EEPES 2025, etc. Here we can mention the international specialized publications ‘Journal of Electrical Engineering’, ‘Journal of Engineering Science and Technology Review’, ‘MDPI Engineering Proceedings’.

The classification of the publications with which Chief Assistant Lyubomir Diyanov Dimitrov, PhD participated in the competition is:

- refereed publications in SCOPUS – 12 pcs.;
- publications in non-refereed journals and proceedings of scientific conferences – 25 pcs.
- papers – 30, of which 12 in the proceedings of international scientific conferences in Bulgaria and abroad, 18 – at national scientific conferences and forums;
 - articles – 7 in scientific journals;
 - in English – 25 pcs.;
 - in Bulgarian – 12 pcs.

In 4 publications, Chief Assistant Lyubomir Diyanov Dimitrov, PhD is the sole author, in 3 issues he is the first author, in 10 he is the second author, and in 20 he is the third or subsequent author.

In addition to scientific publications, Chief Assistant Lyubomir Diyanov Dimitrov, PhD has also participated in the work of 14 projects of educational, scientific research and applied nature, and has led 1 of them. The majority of the projects are of scientific and applied nature. The scientific research contracts are in the field of developing methodologies, models and computer programs for applied mathematical research in electric power supply and electrical equipment with a focus on energy and economic efficiency and storage of electrical energy in urban conditions, etc.

5.3. Implementation activity

The materials submitted for participation in the competition lack evidence of created patents, utility models, inventions, etc. As an implementation activity, the fact that some of his scientific developments are successfully used in the educational process to study the operation of electric vehicles, etc. can be highlighted.

The candidate has participated in the teams of a number of successfully completed university projects, which resulted in the development and implementation of modules and technologies in the educational process and practice..

6. Contributions (scientific, scientifically applied, applied)

Analyzing the materials submitted for participation in the competition, I accept and classify the candidate's contributions as follows:

Scientific contributions:

- Development of approaches for studying the operational behavior of squirrel-cage induction motors. On this basis, an electromechanical model has been synthesized to study the operating modes of an electric drive with a squirrel-cage induction motor for high voltage.
- Models have been derived for increasing the energy efficiency of power electrical equipment by applying frequency control and models have been developed for assessing the electrical losses occurring in the drive motors, as well as the individual components and energy losses under different operating conditions of the electric drive, as well as criteria for assessing the influence of the quality of electrical energy on the dynamic behavior of induction motors.

Scientifically applied contributions:

- Methods and models have been developed for studying the operational behavior of squirrel-cage induction motors on the effects of non-nominal conditions, etc. Virtual measuring instruments, electromagnetic compatibility, electric vehicles, technological processes have been created.
- The changes in characteristic electrical quantities of electrotechnical facilities and objects and their influence on power transformers supplying combined nonlinear loads in the public sector of characteristic electrical quantities of electrotechnical facilities and objects have been studied.
- Development and implementation of a computer mathematical model for estimating the electrical losses occurring in drive motors, as well as the individual components and energy losses under different operating conditions of the electric drive.

Applied contributions:

- Studies of the behavior of a new type of traction DC motor for driving electric vehicles.
- Characteristics of electric vehicles and their associated components have been obtained based on studies of their operational functionality.
- An energy-efficient solution has been proposed to improve the performance of electrical machinery and mechanisms.
- Experimental research carried out on a new energy-efficient three-phase induction motor.
- Measures have been proposed to reduce energy losses in frequency control through analysis of the quality of electrical energy when operating various types of electrical loads.

7. Evaluation of the candidate's personal contribution

Of the 39 scientific papers accepted for review (37 publications and 1 textbook and 1 teaching aid), 4 publications are independent, and in the rest Chief Assistant Lyubomir Diyanov Dimitrov, PhD is a co-author. No dividing protocol for the percentage participation of the authors has been presented, therefore I accept his participation as equivalent. This, as well as the analysis of the scientific papers submitted for review, give me reason to believe that the

candidate has a significant personal contribution to the materials submitted for the competition. This gives me reason to assume that he can set and solve scientific tasks on his own at the level of a well-established scientist, has mastered the tools and is able to apply them.

8. Critical notes and recommendations

I have no significant comments. I do not note some formal omissions, which are inevitable and in no way reduce the quality of the reviews. My recommendations for the future scientific and teaching activities of Chief Assistant Lyubomir Diyanov Dimitrov, PhD are:

- to participate in scientific conferences abroad and publish the results in scientific journals with an Impact Factor;
- to focus scientific research activities and to refine expression when defining specific concepts and facts, striving to avoid stylistic errors;
- to participate in international scientific and teaching exchange programs;
- to develop and publish electronic learning materials;
- to work actively with students and doctoral students, with the aim of creating a team, obtaining more significant results and participating in research projects and programs.

9. Personal impressions

I know Chief Assistant Lyubomir Diyanov Dimitrov, PhD from his participation in various scientific conferences. I believe that he possesses pedagogical skills and competencies, as well as organization, self-discipline and teamwork skills.

I believe that the teaching and research activities of Chief Assistant Lyubomir Diyanov Dimitrov, PhD fully meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Rules for its application and Regulations for the Acquisition of Scientific Degrees and Holding Academic Positions at the Technical University – Gabrovo for the academic position of ‘Associate Professor’.

10. Conclusion

Considering the above, I propose that Chief Assistant Lyubomir Diyanov Dimitrov, PhD be elected as an "associate professor" in the field of higher education 5. Technical Sciences, professional direction 5.2. Electrical Engineering, Electronics and Automation, specialty – ‘Electric Power Supply and Equipment’.

3 November 2025

Reviewer:

/Prof. Ivaylo Stoyanov, PhD/