

REVIEW

by Prof. Eng. Petar Mitrofanov Nakov, Ph.D.

member of a scientific jury appointed by Order No. R-109-95/21.03.2024 of the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

of a competition for appointment to an academic position " PROFESSOR" in the specialty "High-voltage technique", professional direction 5.2. Electrical engineering, electronics and automation, field of higher education 5. Technical sciences,

for the Faculty of Public Health, Department of Medical Equipment, Electronic and Information Technologies in Health Care, according to an announcement in the State Gazette, No. 7 of 23.01.2024.

I. Brief information about the competition

I have been appointed as a member of the Scientific Jury by Order No. R-109-95/21.03.2024 of the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna, and with protocol No. 1/04/01/2024 from a meeting of the Scientific Jury, I am appointed to prepare a review on the procedure for appointment to an academic position "PROFESSOR" in the field of higher education 5. Technical sciences, professional direction 5.2. Electrical engineering, electronics and automation, specialty "High-voltage technology".

The only candidate in the competition is Eng. Margreta Parashkevanova Vasileva, PhD, Associate Professor in the Department of "Medical Equipment, Electronic and Information Technologies in Healthcare", Faculty of "Public Health".

The documents for the competition have been prepared correctly, they meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the Development of the Academic Staff of the MU - Varna. No procedural violations were found.

The set of materials submitted by the applicant on electronic media includes the following documents:

1. Application to the Rector for admission to participation in the competition.
2. Creative CV with the candidate's signature.
3. A certified true copy of the Master's degree with the annex to it.
4. A certified true copy of a diploma for an acquired ONS "doctor".
5. Certified copy of a diploma for the academic position "docent".
6. Certificate of internship in the relevant specialty.
7. Certificate of teaching experience.
8. Certificate of supervision of successfully defended doctoral students.
 - 8.1 Official note from TU - Varna
 - 8.2 Certificate for supervision of successfully defended doctoral students from the MU - Varna
9. Reference study load.
10. Medical certificate.
11. Criminal record certificate.
12. Notice on protection of personal data.
13. Declaration of authenticity of the submitted documents, completed and signed by the candidate.
14. Academic certificate issued by the library of MU-Varna, including:
 - Publications and citations covering the minimum national requirements;
 - Full-text publications and citations, beyond the minimum scient metric requirements;
 - List of scientific works and citations, used for the acquisition of the Doctorate, as well as for the occupation of previous academic positions (AD "principal assistant" and AD "associate professor");

- Application for active profiles in Google Scholar and ORCID (as well as other profiles in scholarly networks, e.g. Research Gate);
- 15. Publications - Group C, equivalent to habilitation thesis and publications - Group D.
- 16. Summaries of scientific publications from Group B, equivalent to habilitation work in Bulgarian and English.
- 17. Summaries of scientific publications from Group D in Bulgarian and English.
- 18. Reference for the original scientific contributions, signed by the candidate (word and pdf).
- 19. List of participations in national and international scientific events.
- 20. List of participations in national scientific and educational projects.
- 21. Documents supporting participation in projects.
- 22. Participation in scientific juries and examination committees.
- 23. List of issued textbooks and teaching aids
- 24. Habilitation extended reference for scientific contributions.

II. Brief biographical details of the applicant

Associate Professor Dr. Eng. Margreta Parashkevanova Vasileva was born on February 11, 1963, Veliko Tarnovo. He received his education successively: in the period 1982 - 1987, Master of Electrical Engineering, majoring in "Electroenergetics", VMEI - Varna; in the period 2000 - 2004 as a part-time doctoral student at the Department of "Electroenergetics" VMEI - Varna, specialty "High Voltage Engineering". He defended his dissertation on the topic "Limiting overvoltage's in 20 kV electrical networks" and is a doctor in the specialty "High Voltage Engineering".

Academic Development:

- 1995 - 1998 - "assistant", specialty "High Voltage Engineering", Department of "Electroenergetics", Technical University - Varna;
- 1998 - 2002 - "art. assistant" specialty "High Voltage Engineering", Department of "Electroenergetics", Technical University - Varna;
- 2002 - 2009 - "ch. assistant professor, specialty "High Voltage Engineering", Department of "Electric Power Engineering", Technical University - Varna; 2009 - 2019 associate professor, specialty "High Voltage Engineering", Department of "Electric Power Engineering", Technical University - Varna.
- From 2019 to the present, he is an associate professor at the Medical University "prof. Dr. Paraskev Stoyanov" - Varna.

In the process of work, associate professor Dr. Eng. Margreta Parashkevanova Vasileva has developed competencies in the specialties of High Voltage Engineering, high-voltage technology, high-voltage technology in medicine, electrotechnical materials, technical safety, sanitary technology.

The publications of associate professor Dr. Eng. Vasileva are related to academic work, 3 textbooks and 3 teaching aids, as well as in research and scientific work, 85 articles and reports.

III. Teaching and learning activity

Prof. Vasileva has over 28 years of teaching experience, of which nearly 5 years at the Medical University "prof. Dr. Paraskev Stoyanov" - Varna.

The candidate worked in elected positions as follows: 2011 – 2015 Deputy Dean at the Faculty of Electrical Engineering, TU Varna; 2015 – 2019 Deputy Rector of TU - Varna, and currently Head of the Department "Medical Equipment, Electronic and Information Technologies in Health Care", Medical University "prof. Dr. Paraskev Stoyanov" - Varna.

The candidate's auditory employment per academic year is 200 academic hours.

According to a report presented by the Academic Activities Directorate of MU-Varna, for the period 2019-2023, Assoc. Prof. Vasileva's total academic workload is 566 hours, of which 306 hours are lectures and 260 hours are exercises under the norm for Head of Department 126 hours, according to decision of the AC of MU-Varna (Protocol No. 30/11.04.2011).

The publications of associate professor Dr. Eng. Margreta Parashkevanova Vasileva related to the academic work are 3 textbooks and 3 study aids. For participation in the competition, 2 textbooks and 2 study aids were presented, which corresponds to 73.33 points according to indicators E23-E24.

Prof. Vasileva supervised and co-supervised the scientific work of three successfully defended PhD's, which met the requirement for a minimum of 80 points under indicator E17.

IV. Scientific output and scientometric data

According to the reference prepared by the library of the MU of Varna, Assoc. Prof. Vasileva participated in the competition with publications other than those for acquiring the academic position of "associate professor" and "doctor", arranged according to a model proving the fulfillment of the minimum requirements for occupying the academic position "Professor" and distributed as follows:

A1. Dissertation work for obtaining the educational and scientific degree "doctor" - 50 points.

C4. Habilitation work or scientific publications (not less than 10) in publications that are referenced and indexed in world-renowned databases with scientific information, 10 publications, 195 points. All submitted publications are indexed in Scopus. All presented publications are co-authored, and in 4 of them the candidate is the first author.

D7. Scientific publications and reports published in scientific publications, referenced and indexed in world-famous scientific information databases Scopus - 4 issues, 93.33 points. The publications cover the period 2018 – 2022. All submitted publications are co-authored and the candidate is the first author.

D8. Scientific publications and reports published in non-refereed peer-reviewed journals or published in edited collective volumes - 19 publications, 145 points.

Total for groups G7 and G8 – 238.33(3) points with a required minimum of 200 points.

D12. Citations or reviews in scientific publications, referenced and indexed in world-renowned databases of scientific information or in monographs and collective volumes - 17. According to the academic reference prepared by the library of MU-Varna, the total number of citations in scientific publications, referenced and indexed in world-renowned databases with scientific information (Web of Science and Scopus) is 17, respectively 170 points and significantly exceeds the minimum requirements of 100 points in the professional field of the competition.

V. Contributions to the Candidate's Works

In this section, a brief analysis of the main scientific, scientific-applied, applied and methodical contributions and characterization of the main achievements of the candidate is made, as well as their significance for science and practice and future prospects for development.

V.1 SCIENTIFIC PUBLICATIONS, EQUIVALENTS OF HABILITATION THESIS ON TOPIC:
"Model studies of the processes of creation and limitation of over voltages in electrical networks"

B4-01 Analysis of the operation of fault protections in a TN system - Develop simulation models of low voltage and voltage networks of single-phase RCDs, make it possible to perform a more precise assessment of electrical safety.

B4-02 Coordination of the operation of devices for relay protection and overvoltage protection in electrical networks of medium voltage 20 kV. The research system model is embedded in MATLAB SIMULINK.

B4-03 Simulating the process of occurrence and limitation of a lightning strike in a medium voltage electrical network. The results of the simulation explain the need for the installed surge protection devices at both ends of the cable line, which proves with new methods in the regulations for the device of electrical equipment and power lines. The obtained results are used for a more accurate selection of the parameters of the surge suppressors taking into account the network configurations and the applied disturbances, which provide better insulation coordination.

B4-04 Model study of lightning protection at a 110 kV substation. The high voltage switchgear simulation model presented in the paper can be successfully used to study the propagation of electromagnetic waves caused by lightning. The developed model is applicable to study the protective characteristics of metal oxide surge arresters openings in electrical substations, taking into account the equipment parameters.

B4-05 Effect of frequency on resistivity and dielectric permittivity of multilayered soil. The obtained mathematical expressions for the dependence of the dielectric permittivity on the frequency are used to calculate the distributed parameters of the grounding system, which are used in modelling the grounding loop to study the wave propagation in a substation.

B4-06 Investigation of atmospheric overvoltage's during reverse discharge. The high voltage substation model is developed in MATLAB Simulink environment. It finds application in researching the protective action of metal oxide surge arresters drains - MOSA. It is possible to make a more precise selection of MOSA and coordination of its parameters with the electrical strength of the equipment in the substation. The same approach as in B4-04 applies.

B4-07 Assessment of the reliability of the surge protection system of an electrical distribution substation composed of surge arresters with different operating parameters. The data obtained as a result of this study cannot be used as highly accurate estimates of reliability, but the approach allows to perform a comparative analysis of all possible variants of overvoltage protection when using protective devices, SPS or SA, with different characteristics.

B4-08 Improving the quality of training through computer visualization of electrical processes in power systems: A simulation model of a 20 kV power network with digital relay protection can be used for training and upgrading the qualifications of electrical engineers, as well as applied to the analysis and verification of selected settings of digital relay protections. The developed models for the study of MOSA in electrical networks can be used for their more precise selection, considering the configuration of the circuit and its elements under the influence of overvoltage's of different shape and duration.

B4-09 Switching overvoltage's in overhead power lines 220 kV. The determination and analysis of switching overvoltage's by studying the overhead power line model can provide important data for

future research and insulation coordination. This type of model studies can improve system reliability and reduce maintenance and management costs.

B4-10 Overvoltage's during a single-phase fault in high-voltage networks. Modelling of transient over voltages gives us insight into the system parameters in the transient regime. The model validates existing knowledge by new means. It is possible to use it to optimize the parameters of the relay protections in the aspect of reducing overloads.

Publications B4-1 to B4-10 are original and have scientifically applied contributions.

Modern software platforms are used in a large part of the developments, with which:

- Three-phase simulation models of high-voltage electrical systems were developed in the MATLAB Simulink program environment for the study of wave processes (B4-01, B4-04, B4-06, Г8-08, Г8-12, Г8-14, Г8-16, D8-17, D8-19)
- Three-phase simulation models of an electrical system with a nominal voltage of 220 kV have been developed in the ATP-EMTP program environment for the study of atmospheric, switching and established over voltages. (B4-09, B4-10, D7-01, D7-02)

Associate Prof. Vasileva's claims are defined as proving by new means substantial new aspects of existing scientific problems and theories.

V.2 The following publications present results in the following areas:

Atmospheric over voltages in G7-01, G7-03, G8-01, G8-03, G8-05, G8-12; Model study of lightning protection at a 110/20 kV substation, G8-10; Energy capacity of metal oxide surge arrester openings in power lines 20 kV, G8-14; Limitation of lightning surges in 110 kV substations. The simulation model of the electrical system presented in the report can be used to study wave propagations in electrical substations G8-17; Model study of the protection against incoming atmospheric overvoltages in a 110kV substation. A layout of a real model of the grounding system is considered in the study of the protection against incoming impulse overvoltages in 110 kV substations, which leads to a more precise assessment of the atmospheric overvoltages acting on the equipment. The developed mathematical models confirm the existing knowledge with specific practical applications.

Lightning protection and electrical safety. Publications G8-02 and G8-04, critically evaluated standard for lightning protection BDS EN 62305. Publications: G8-08 Analysis of the method for calculating contact voltage in the presence of two-layer soil; G8-11 Influence of the soil structure in the design of grounding networks in a two-layer soil environment; G8-13 Using a Z-METER III measuring device to determine the soil resistance for sizing the grounding system of an electrical facility; G8-15 Experimental study of soil electrical parameters for grounding system design purposes; D8-16 Model diagram of the grounding system of electrical substations for the study of wave processes; G8-18 Regression analysis of experimental data on soil electrical parameters depending on humidity and frequency; D8-19 Determining the dangerous lightning current levels for 220 kV electrical substations, in their essence, represent the development of mathematical models of the elements of the substation scheme when the lightning current flows. Voltages in electrical equipment are evaluated. Analyses the ways of safe operation of electrical equipment. The publications are original and have scientifically applied contributions.

The publications on switching overvoltages G7-02 and discharge physics, partial discharges G7-04 contain elements useful for a specific application.

In the field of lighting and installation technology, there are two publications - Г8-06, Analysis and comparative evaluation between energy-efficient LED drivers with autonomous power supply and Г8-07, Investigation of some influences of the intrinsic parameters of specialized LED integrated circuits that have scientific applied contributions.

Relay protection: In publication G8-09, a model study of the processes in current measuring transformers for the purposes of relay protection is done. The compiled model is sufficiently accurate for practical application.

Based on the analysis of the presented materials, I can judge that the publications, formulated contributions and obtained results are the personal merit of the candidate.

I accept all contributions on merit and scient metric criteria. The candidate's contributions in the indicated scientific areas show high professional competence.

6. Critical remarks and recommendations

The Essential critical opinions have been discussed with the authors when presenting the developments and irregularities have been removed from the final form of the publications, in the cases of peer review of doctoral theses and related publications. I have no significant critical remarks about the presented materials for the competition.

CONCLUSION

The documents and materials presented by Associate Professor Dr. Eng. Margreta Parashkevanova Vasileva meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Rules for the Implementation of the LDASRB and the Rules for the Development of the Academic Staff of the MU - Varna.

The candidate has submitted a sufficient number of scientific works, published outside of these, to obtaining the degree "doctor" and the academic position "associate professor". The presented materials contain original scientific and applied contributions. Assoc. Prof. Vasileva has excellent results in academic and research activities, which exceed the minimum national and additional requirements of LDASRB, the Regulations for its application and the Regulations for the development of the academic staff at the MU - Varna.

I give a positive assessment of academic work, research papers and original contributions. With my vote, I will propose to the Scientific Jury to elect Associate Professor Eng. Margreta Parashkevanova Vasileva Ph.D. to appointment the academic position "PROFESSOR" in the specialty " High-voltage technique", professional direction 5.2. Electrical engineering, electronics and automation, field of higher education 5. Technical sciences.

05/21/2024

Paris

Reviewer

Prof. Ph.D. Eng. Petar Nakov

Заличено на основание чл. 5,
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