POSITION

by competition for the academic position "Associate Professor"
in a professional direction 5.4. "Energy",
promulgated in State Gazette: issue 4/13.01.2023 for the needs of TU-Varna, Department of Electrical Power Engineering"
with candidate ***Milena Dimitrova Ivanova***, PhD, chief assistant, TU-Varna

Reviewer: ***PhD Eng Iva Dimitrova Draganova-Zlateva,*** **Assoc.** ***Prof.***

1. General and biographical data

The only candidate in the above-mentioned competition is Milena Dimitrova Ivanova, assistant professor, Ph.D., graduated from the "Communications Engineering and Technologies" specialty, Bachelor and Master at TU-Varna (2005 and 2007). In 2016, she acquired a PhD from the National Academy of Sciences in the field of: Transport, Shipping and Aviation National Academy of Sciences: Power supply and electrical equipment by branch (of the ship), subject of the DT "Electrical processes in circuits for generating a high-voltage discharge pulse in a liquid medium". From 2007 to 2017, he worked as AD assistant to cat. "Electroenergetics", and from 2017 - ch. assistant.

2. General description of the presented materials

The candidate Milena Dimitrova Ivanova, assistant professor of engineering, submitted the following documents for participation in the competition:

- Autobiography;
- Copy of the diploma for the acquired educational and scientific degree "doctor";
- Copies of employment contracts for JSC "Assistant" and JSC "Chief Assistant";
- Reference for the fulfillment of the minimum national requirements for the occupation of the academic position "Associate Professor" from the Regulations for the Application of ZRASRB and the minimum requirements from the Regulations for the terms and conditions for the occupation of academic positions in TU - Varna;
- Reference to scientific, scientific-applied and applied contributions;
- List of publications on the dissertation work for the acquisition of the ONS "Doctor";
- List of publications presented in the competition for the academic position "Chief Assistant";
- List of scientific works submitted for participation in the competition for the acquisition;
- Declaration of reliability of the information provided;
- Declaration of originality of contributions;
- Declaration of absence of plagiarism in the presented scientific works;
- Declaration of conformity of names;
- Reference for the horary of the guided learning activity, reference for the reported learning activity;
- Reference for doctoral graduates and work with students and doctoral students on research projects;
- Reference for personal contribution to the modernization of the material and technical base of the Department of Electrical Power Engineering;
- Certificate of participation in research projects;
- Reference for participation with reports at international and national forums;
- Certificate of membership in a professional organization in the relevant scientific field .

31 scientific papers are accepted for review , which are outside the dissertation and are counted in the final evaluation, of which ***1 no.*** in a scientific journal, ***29 nos*** . at scientific conferences and ***1 pc.*** in the Yearbook of TU - Varna. Of the scientific articles and reports submitted for participation in the competition, 19 are indexed in the Scopus database , 25 are in English and 6 in Bulgarian. The presented works are directly related to the current competition for the appointment of JSC "Docent" and are in the professional direction 5.4. "Energy ", scientific specialty "Electrotechnical materials and cable technology". According to the reference submitted by the candidate in the competition, the scientometric indicators are shown in Table 1.

Table 1.

A group of metrics	**Min. No. t.**	**No. t. of the candidate**	**Number of points by main indicators of a group**	
A	50	50.00	Diploma for ONS "Doctor" No. 34/12.07.2016. Issued by: VVU " N.Y. Vaptsarov "-city Varna	
B	100	232.00	B3	0
			B4	232.00
D	200	226.44	D7	123.10
			D8	103, 34
D	50	60	D12	60
Z	30	692	Timetable of lectures given at TU-Varna for the last three years	
Total:	***430***	***1260.44***		

Conclusion: The Scientometric indicators shown in Table 1 show that the minimum national requirements for occupying AD "Docent" have been met .

3. General characteristics of the candidate's research and scientific-applied activity.

The research and scientific-applied activity of ch. Assistant Professor Milena Dimitrova Ivanova is in the field of electrotechnical materials and cable technology and power engineering.

3.1. Electrotechnical materials and cable equipment - 14 pcs. publications.

3.1.1. Studies of high-voltage discharges in a liquid medium - the results of the work in this area have been published in 8 nos. publications .

3.1.2. Studies of modern materials for EMF protection - on this issue, the results have been published in 1 no. publications.

3.1.3. Research on semiconductor device (LED) control circuits - 2 publications.

3.1.4. Polymer insulators - 1 no.

3.1.5. Cable Engineering - Publications 2 no.

3.2. Electricity – 1 5 pcs. publications.

3.2.1. Studies of grounding and lightning protection installations - publications 7 nos .

3.2.2. Monitoring, verification and management of indicators for the quality of electrical energy - publications 8 nos .

3.3. Publications according to indicator C.4. - scientific publications (not less than 10) in publications that are referenced and indexed in world-renowned databases of scientific information. 10 pcs are presented. works in accordance with the above requirements with a total no. item 227. The presented works are in different fields - electrotechnical materials and cable technology, safety technology and power engineering.

4. Assessment of the candidate's pedagogical training and activity.

Ch. Milena Dimitrova Ivanova, assistant professor, Ph.D., is an established teacher with 15 years of teaching experience in the department of "Electrical Engineering" of the Technical University of Varna. As can be seen from the attached reference for the horary of lectures held at TU-Varna for the last three years, the candidate was a leading teacher in the disciplines: "Electrotechnical Materials" - for the Bachelor's Degree, "Technical Safety" - Bachelor's Degree, "Coordination and diagnostics of electrical insulation systems" - OCS "bachelor", "Management of working conditions and production risk" - OCS "bachelor" and "Diagnostics of cable power lines" - OCS "bachelor" with a total schedule of 692 study hours. She is the co-author of 2 textbooks. Ch. Assistant Professor Milena Dimitrova Ivanova, Ph.D., is the supervisor of 12 graduate students studying at the Bachelor's and Master's Colleges.

This gives me the reason to determine Ch. Assistant Professor Milena Dimitrova Ivanova, PhD, as a well-established teacher with high professional and engineering-technical qualities.

5. Basic scientific and scientific-applied contributions.

I accept the applicant's reference for the main contributions in the works presented.

5.1. Scientific contributions - A new type of analysis of an autotransformer discrete variable voltage regulator is proposed (D.7-5), a methodology for determining the maximum contact voltage (B.4-7) and determining the permissible leg voltages (D.7- 8) .

5.2. Scientific-applied contributions - A model is proposed for calculating the water resistance during the first half-period of a periodically decaying high-voltage discharge pulse in water by using a capacitive energy storage system based on experimental studies (B.4-2) ; A variant of the configuration of a tube high-frequency generator with a matching section - L-shaped inductive-capacitive converter is proposed . (D.8-3). Experimentally, in real conditions, the correlation between the electrical and thermal resistance of the soil has been investigated for the purposes of the thermal sizing of cables (B.4-9). The suitability for backfilling of the natural varieties of the soil base found along the cable laying route was investigated (B.4-10). A system was developed for expert assessment of the quality of electric energy and power supply (D.8-1). The causes of power outages in medium and high voltage electrical networks are analyzed (D.7-7). A simulation model of an earthing network with and without vertical earthing conductors was created to determine the maximum possible potentials in the area of the network in the event of a direct lightning strike (D.8-10). Experimental determination of the specific volumetric resistance ρ_v of the soil and the dielectric permittivity ε_r depending on the frequency of the electromagnetic field (B.4-5). Investigation of the variation of contact voltages in the grounding installations caused by lightning strikes at different points of the grounding network by using a simulation model (B.4-8). An approach for obtaining data for ρ and ε_r is proposed , where a precise analysis of soil processes under the impact of lightning impulses is required (D.8-11). The existing diagnostic methods for the maintenance of polymer composite insulators were analyzed (B.4-3). A comparative study was made between single-circuit and double-circuit regulating devices for controlling the direct current discharge in terms of the stability of the discharge current (D.8-4). Determination of the resistance change of two types of high-voltage switches - trigatron and thyratron (D.8-8). The electrical processes in an autotransformer discrete AC voltage regulator were analyzed by the state variable approach in the time domain (D.7-4). A simulation study was conducted on the processes and efficiency of an autotransformer discrete AC voltage regulator with different loads – R , RL load (D.7-1, D.7-2, and D.7-6). The automatic shutdowns of relay protection depending on the type of damage and the type of lines in a 110/20 kV electrical substation are analyzed for a certain period of time. An approach for fault analysis

on medium voltage lines is proposed, which can be used by power distribution companies to increase power supply reliability. ***(D.7-9)***

5.3. Applied and methodological contributions - An experimental study of the commutation capabilities of a three-electrode controllable air discharger with two spatially different gas discharge gaps (D.8-5) was conducted. The influence of temperature and energy characteristics on the change in the resistance of the liquid medium during the formation of a discharge pulse was analyzed (D.8-9). Experimental study of the generated harmonics and the change of the amplitude of the supply voltage of a system for generating high-voltage discharge pulses for water purification (D.8-12). The change in electromagnetic field parameters in buildings near a slotted radar installation was analyzed waveguide antenna (D. 7-3). The change in electromagnetic field parameters was analyzed for standard household configurations (with different frequencies) as electromagnetic field sources and screened with the use of protective flexible screens (conductive textile fabrics with silver and copper-nickel fibers) (B.4-4). Experimental study of a system with capacitive energy storage for generating a periodically decaying high-voltage discharge pulse for electrical safety assessment (B.4-1). Comparative analysis of circuits with different LED driver topologies, the functional capabilities of an integrated circuit specialized for LEDs (D.8-6 and 8-7). A mathematical description of the frequency dependences of the specific volume resistance and the dielectric permittivity of the studied soil samples is proposed (B.4-6). Implementation of e-learning in the Faculty of Electrical Engineering of TU-Varna (G.8-2).

6. Significance of contributions to science and practice.

The significance of the candidate's contributions in the competition - ch. Assistant Professor Milena Dimitrova Ivanova, Ph.D., for education, scientific research and innovation is indisputable. The importance can be judged by the presented scientific reports, with which he participated in prestigious international and national scientific forums with international participation and the scientific publications referenced and indexed in the world-famous databases with scientific information - Scopus and Web of Science , as well as those in non-refereed journals with scientific review or in edited collective works - materials from national and international scientific conferences, in the country and abroad.

I define the candidate's contributions to science and engineering practice as significant and representing a good basis for further in-depth scientific research and achievements in the scientific field of the competition. The candidate has published a significant number of scientific works with scientific and scientific-applied contributions to science, innovation and education.

It has participated in a relatively large number of scientific research and scientific applied projects and implementation contracts, with which it also became well known to the professional and scientific community in the country. This is a convincing proof of recognition of her scientific achievements by a large professional community in the country.

She participated in the writing of teaching aids - a manual for laboratory exercises on electrotechnical materials. Her achievements have become known to the professional and scientific community at home and abroad. Her works are cited in scientific publications, referenced and indexed in a world-renowned scientific information database (Scopus).

The minimum quantitative indicators for holding AD "associate professor", for all groups, are fulfilled, in accordance with Art. 1, para. 3 and Appendix 1 from PUZAD in TU-Varna, for the accredited professional direction 5.4. "Energy", as groups B, D and Z are overfilled.

Therefore, the candidate's contributions in the declared scientific field are significant, and the information communicated in them is useful, sought after and needed by other authors and specialists, and most importantly - the names of the candidate and his co-authors have long been well known in the scientific community. literature and in engineering practice.

7. Critical notes and recommendations.

My main remark is the lack of subject matter in the works presented under indicator C.4. As mentioned in item 3.3. these works cover three scientific areas - electrical materials and cable technology, safety technology and electric power engineering.
I have no remarks of an editorial or scientific-technical nature regarding the works submitted for review (except for the substitute monographs). It is clear that the candidate has covered several important scientific areas. I recommend that the candidate direct his efforts in writing a monograph both in the field of the competition and in the areas where he works and experiments.

8. Personal impressions and opinion of the review.

I have known the candidate in the announced competition for several years. I have very good impressions of her participation in conferences, the reports of which are published in SCOPUS. She is a well-known researcher with established scientific criteria, great activity and enterprise, with a wide range of professional and scientific interests.

CONCLUSION

The scientific works presented in the competition contain significant results, for which I give a positive assessment. Sufficient scientific, scientific-applied and applied contributions have been received. The minimum requirements have been met, the scientific -metric indicators have been met, and based on this, I find it reasonable to propose ***ch. Milena Dimitrova Ivanova, assistant professor, Ph.D to occupy the academic position of "ASSOCINATE PROFESSOR"*** by professional direction 5.4. "Energy", scientific specialty: "Electrotechnical materials and cable technology", at the Department of Electrical Power Engineering at the Technical University - Varna.

Date: 10.06.2023

REVIEWER:
Assoc. prof. PhD Eng. Iva Draganova-Zlateva