

## REVIEW

by competition for an academic position **Associate Professor**

in higher education area **5. Technical Sciences**

professional field 5.2. **Electrical engineering, electronics and automation**

announced in SG 90 /11 Nov 2022 for the needs of the Institute of Information and Communication Technologies – Bulgarian Academy of Sciences, Department "Intelligent Systems"

Applicant: **Tatyana Radeva Radeva-Stoilova, Dr.**, Chief Assistant

Reviewer: **Ivan Stoyanov Yatchev, D.Sc.**, Professor

### 1. General and biographical data

The only candidate in the competition - Chief Assistant Dr. Tatiana Radeva-Stoilova - works in the "Electrical Power Engineering" department of TU-Sofia. Her research activities are mainly focused on the field of the announced competition.

Tatyana Radeva-Stoilova was born on June 16, 1979. In 2002 and 2005, she completed her education at the Technical University of Sofia and obtained respectively "Bachelor" and "Master" degree majoring in "Electrical Engineering" with the professional qualification "Electrical Engineer". Also, in 2005, she graduated with a master's degree in TU-Sofia, majoring in "Public Administration". From 2006 to 2012, she was a part-time doctoral student at the "Electrical Apparatus" department of TU Sofia. In 2015, she successfully defended her thesis for the PhD degree on the topic " Study of electrodynamic forces in substation busbar systems".

From 2005 to 2012, she worked successively in: Energy Supply "Kremikovtsi", El-Test LTD, Net Project LTD, Finvera Consult LTD, Transgeo LTD, and her main activity is related to the design of electrical installations.

From 2013 until now, she has been working as an assistant and chief assistant at the Department of Electrical Power Engineering at Sofia Technical University.

Dr. Radeva teaches classes in several disciplines at the "Electrical Power Engineering" department.

Ch. Ass. Dr Tatiana Radeva, has full design competence in the areas "Electrical" and "Fire Safety". She also went through additional training courses and has a professional qualification in "Energy efficiency inspection and certification of buildings". She also underwent specialized training for energy managers in energy efficiency management and BDS EN 50001 in industrial enterprises, incl. SMEs.

## **2. General description of the materials presented**

The applicant has submitted 1 monograph, 21 scientific papers and 2 manuals for students. Information about citations, participation in research projects is also given.

The presented works are as follows:

- Monograph: T. Radeva, "Measures for energy efficiency of buildings", TU-Sofia, ISBN: 978-619-167-498-5, 135 pages;
- Scientific publications in editions that are referenced and indexed in world-renowned databases of scientific information. 2 papers are included here, both reports at an international conference in Bulgaria. Both publications are in English. In one (with two authors) the candidate is in first place, and in the other (with 5 authors) – in fourth place;
- Scientific publications in non-refereed peer-reviewed journals or in edited collective volumes. 19 works are included here. Of these, 12 are papers in journals in Bulgaria, and 7 are reports at conferences in Bulgaria. 13 of the publications in this group are in Bulgarian, and the remaining 6 are in English. 9 publications are with the candidate being the only author, 8 are with two and 2 with three authors.

Information about citations of the candidate's works is presented, from which it is clear that the candidate has noticed 14 citations. Two of them should not be counted.

The candidate has submitted information about participation in 2 research projects.

Along with the competition materials, two manuals for students are also presented, one of which is with the candidate being the only author:

- Boev Kr., D. Bogdanov, T. Radeva, "Manual on Electric Power Engineering", TU-Sofia, ISBN 978-619-167-313-1, 101 pages, 2018.
- Radeva T., "Manual for calculation of rigid busbars", TU-Sofia, ISBN 978-619-167-312-4, 41 pages, 2018.

Certificates of additional qualification, a list of objects designed by the applicant, as well as references from companies are also presented.

## **3. General characteristic of the applicant's scientific and applied research**

The scientific research activity of the candidate is mainly directed in the field of electrical power engineering.

The scientific and applied activity of the candidate is mainly in three directions:

- Design of electrical installations of buildings. In this direction, a list of 11 objects designed by the applicant is presented;

- Inspection of sites for energy efficiency – a list of 20 inspected sites is presented;
- Preparation of reports under European programs – a list of 9 reports on street lighting, energy efficiency and energy audit is presented.

It can definitely be said that Ch. Ass. Radeva is an established specialist in the fields of her research, with a high level of competence.

#### **4. Assessment of pedagogical ability and activity of the applicant**

The candidate is an established long-term teacher of disciplines in the field of the competition. Ch. Ass. Radeva has taught classes in various disciplines at the Department of Electrical Power Engineering at TU-Sofia. She was the supervisor of 17 graduates who successfully defended their diplomas - a list of the graduates is attached.

The two manuals presented, which are manuals on electrical power engineering and for the calculation of rigid current-carrying busbars for the students of the "Electrical Engineering" and "Electrical Power Engineering and Electrical Equipment" majors at TU-Sofia, should also be evaluated on their merits.

#### **5. Main scientific and applied scientific contributions**

The presented author reference for the contributions in the presented scientific publications corresponds to a significant extent to the achieved results. The main scientific and scientific-applied contributions in the presented works can be summarized as follows:

- Contributions in the monographic work

The contributions in the monographic work are predominantly scientific-applied and applied in nature. The following can be noted as more significant contributions:

- creation, calibration and normalization of a model of a specific public building in order to estimate its energy efficiency;
- analysis of energy consumption, proposal of measures to reduce energy costs and technical-economic evaluation of the results of the measures for a specific public building.
- development of a photovoltaic system for a public educational building.

- Contributions to scientific publications beyond the monographic work

The contributions in these publications can be summarized as follows:

- experimental studies of the thermal effect of a short circuit in a laboratory busbar system, using and comparing two approaches [5, 18];
- development of optimization models of power systems, hydroelectric plants and systems with controllable loads [6, 7, 8];
- a mathematical model was proposed for forming an optimal microgrid operation schedule for contracted supplies of two types of services from and to the external network, and several scenarios for contracted service levels were analyzed [11, 12];
- a review and systematization of the means for measuring electrical energy, including non-sinusoidal changes in the current have been made [15, 16];
- a review and analysis of the possible consequences of the application of artificial intelligence in military affairs has been made [19];
- approaches for modeling and optimization of administrative processes are proposed [22, 23, 24];
- an energy analysis of an Educational Center for extracurricular activities and culture is carried out, potential measures to reduce energy costs are considered and a technical and economic assessment of the measures is made [21];
- a photovoltaic system is developed for the Educational Center for extracurricular activities and culture [20];
- specific tasks for the development of a water heating installation in a hotel complex have been solved [13, 17];
- specific energy-saving measures have been proposed to increase the energy efficiency, security and operational characteristics of the street lighting systems and reducing the electricity costs of the municipality of Chelopech [9].

The contributions have a predominant character of proving by new means substantial new sides in existing scientific problems.

## **6. Significance of the contributions to science and practice**

The significance of the candidate's contributions to science and practice is indisputable. The correspondence of the indicators achieved by the candidate to the minimum requirements is given in Table 1, including only the indicators for which the candidate has a non-zero number of points.

As can be seen from the comparison with the minimum requirements, on all indicators the values for the candidate correspond, and on most of them they significantly exceed the minimum requirements.

That is why the presented materials should be highly evaluated from the point of view of fulfilling the requirements of the Regulations on the specific conditions for acquiring scientific degrees and occupying academic positions at IICT-BAS.

Table 1. Compliance with the minimum requirements by groups of indicators

Group of indicators	Indicator	National requirement	IICT requirement	Candidate's points
A	1. PhD Thesis	50	50	50
B	3. Habilitation work - monograph	100	100	100
Г	7. Scientific publication in editions that have been referenced and indexed in world-renowned scientific information databases 8. Scientific publication in non-refereed peer-reviewed journals or in edited collective volumes	200	220	301,2
Д	12. Citations or reviews in scientific publications, referenced and indexed in world-renowned databases of scientific information or in monographs and collective volumes 13. Citations in monographs and collective volumes with scientific review 14. Citations or reviews in non-refereed scientific peer-reviewed journals	50	60	105
Е	19. Participation in an international scientific or educational project 24. Published university manual or manual used in the school network	-	20	66,6
Total		400	450	622,8

The significant practical applicability of the obtained results should be noted. This is also evidenced by all three positive references from companies about the results of the candidate's work.

## 7. Remarks and recommendations

A more precise representation of the materials may be recommended. There are small inconsistencies of the same information presented in different sections of the materials, including different numbering of scientific publications.

A partial overlap of results is noted, for example in works [13] and [17], [4] and [20].

Some papers are related to the monographic work and could be transferred to it without violating the minimum requirements.

It would be good for the candidate in the future to focus on more intensive publication in editions that are referenced and indexed in world-renowned databases of scientific information, including those with impact factor.

## 8. Personal impressions and opinion of the reviewer

I know Ch. Ass. Radeva since her student years and I had the opportunity to follow her development, being one of her supervisors during her doctoral studies. She developed and established herself as a highly qualified specialist and lecturer. She is always ethical and correct with colleagues and students. She is characterized by a desire for continuous improvement and expansion of her areas of competence.

## CONCLUSION

On the basis of acquaintance with the submitted scientific papers, their importance, the scientific, scientific-applied and applied contributions contained in them, as well as on the fact that by most indicators the applicant significantly exceeds the minimum requirements according to the Regulations on the specific conditions for acquiring scientific degrees and holding academic positions at IICT-BAS, I find it reasonable to propose Ch. Ass. Dr. Tatyana Radeva Radeva-Stoilova to take the academic position of "Associate Professor" at IICT-BAS, for the needs of Department "Intelligent Systems" in professional field 5.2. Electrical engineering, electronics and automation.

Date: 28 Feb 2023

REVIEW

НА ОСНОВАНИЕ

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