REVIEW

by competition for taking the academic position of "associate professor" in the field of higher education 5. Technical sciences, professional direction: 5.2. Electrical engineering, electronics and automation, scientific specialty "Electric Power Engineering (Electrical Networks and Systems)", announced in the State Gazette, no. 42/12.05.2023 with candidate: Chief Assistant Dr. Eng. Mehmed Kadir Hasan

Reviewer: Prof. Dr. Eng. Tanya Ivanova Pehlivanova-Gocheva, Thrakia University - Stara Zagora, appointed as a member of the scientific jury according to order No. RD-185/27.06.2023. of the Rector of the University "Prof. Dr. Asen Zlatarov" - Burgas.

1. Brief biographical data

In the competition for the academic position "associate professor" in the scientific specialty "Electric power engineering (Electrical Networks and Systems)" in professional direction 5.2. Electrical engineering, electronics and automation, only one candidate participated - Chief assistant Dr. Eng. Mehmed Kadir Hasan.

He graduated with a master's degree in TU-Varna in 2000. He holds a diploma for the educational and scientific degree "doctor" in the scientific specialty "Electrical networks and systems", from 2021, issued by TU-Sofia, EPF-Sliven. He worked as a lecturer at the Technical College of Assen Zlatarov University-Burgas during the period 1997-2002, and as assistant and chief assistant since 2018.

2. General description of the presented materials

Chief assistant Mehmed Hasan participated in the competition for the academic position "associate professor" with one monograph with 10 publications related to it, 17 scientific publications (3 publications in refereed and indexed in world-famous databases editions, 12 in the journal Izvestia of TU-Sliven and 2 in Yearbook of "Prof. Dr. Asen Zlatarov" University-Burgas), 3 co-authored textbooks and 3 independent study aids.

Of the presented publications, I do not review the publications in the Yearbook of the University "Prof. Dr. As. Zlatarov" because for 2021 and 2022 it is not on the NACID list of peer-reviewed publications. Publications D.7.2 and D.7.3 are not visible

either in Scopus or in Web of science under the name of the author. From the sites of the conferences where D.7.2 was published, I find no definite evidence that this publication is in those databases. From the website of the journal in which D.7.3 was published, it can be seen that it is not indexed in Scopus or Web of science. I evaluate the two publications with 20 points each. Publications D.8.2 and D.8.11, which are co-authored, are evaluated by the candidate with 20 points, and they must be evaluated with 10 points (20/number of authors). After the reduction, the total number of points under indicator D becomes 300.

I do not recognize the scientific projects indicated in indicators E18 and E20 as national and do not award points for them. After the reduction, the total number of points for indicator E becomes 113.33.

All but two publications are independent. 3 of the publications are in English and the rest in Bulgarian. The studies in the scientific papers do not repeat those of the dissertation.

8 citations in scientific publications, referenced and indexed in world-famous databases with scientific information (SCOPUS, Web of Science) and 21 citations in non-refereed journals with scientific review are indicated.

The publishing activity of chief assistant Dr. Mehmed Hassan meets the minimum national requirements and the requirements of the University "Prof. Dr. Asen Zlatarov"-Burgas to the candidates for the academic position of "associate professor", according to the Regulations for the conditions and procedures for acquiring scientific degrees and holding academic positions at the University "Prof. Dr. Asen Zlatarov"-Burgas.

A list of 14 developed study programs is presented.

The fulfillment of the minimum national requirements and the requirements of the University "Prof. Dr. Asen Zlatarov"-Burgas is as follows:

A group of indicators	Implementation	Number of points achieved	Minimum national requirements	Minimum requirements of the University "Prof. Dr. As. Zlatarov"
A	A dissertation has been defended for the award of the Educational and Scientific	50	50	50

	Degree "Doctor".			
C	Monograph on "Active-adaptive electrical networks", TU-Sofia, 2022.	100	100	100
D	1 scientific publication in a conference that is refereed and indexed in SCOPUS (D.7) and 14 publications in non-refereed peer-reviewed journals or in edited collective volumes (D.8).	300	200	300
E	8 citations in Scopus or Web of science (E.12) and 21 in non-refereed peer-reviewed journals (E.14).	122	50	100
F	3 textbooks for universities (F.23) and 3 teaching aids for universities (F.24).	113,33	-	100
	Total points	685,33	400	650

3. Evaluation of the candidate's educational and teaching activities

Chief assistant Dr. Mehmed Hassan has 5 years of experience as a teacher at the Technical College and 5 years of experience as an assistant and chief assistant at the University "Prof. Dr. Asen Zlatarov"-Burgas. Conducts lectures and exercises for students of the "professional bachelor" and "bachelor" degree in 13 disciplines - "Electrical machines", "Electrical Apparatus", "Electric power engineering", "Renewable energy sources", "Theoretical electrical engineering", "Lighting technology"; "Electrical equipment", "Electrical Measurements", "Testing and Reliability of Electrical Apparatus", "Educational practice", "Electrical Drive", "Electrical Materials" and "Materials in Electronics".

He is the author of 3 teaching aids with tests on "Electrical machines". He is the co-author of 3 textbooks for students on "Electricity from renewable energy sources".

In the last 3 years, he drove an average of 545 hours.

A reference for 14 study programs developed by the candidate is presented. In the Technical College has developed study programs for the "Professional Bachelor's Degree" for the specialty "Electrical Engineering" in the disciplines "Electrical

machines", "Electrical apparatus", "Electric power engineering", "Electrical equipment", "Educational practice" 2, 3, 4, 5 and 6 part; for the specialty "Automotive electronics" in the disciplines "Educational practice" 2 and 3 part. In the Faculty of Technical Sciences has developed study programs for the Master's degree for the "Electrical Engineering" specialty in the disciplines "Non-traditional and renewable energy sources in the power industry", "Switching and protection technology" and "Electrical machines and apparatus".

The above-mentioned data give me reason to assess the candidate's educational and teaching activities as very good.

4. Evaluation of the candidate's scientific and applied scientific activity

The research work of Chief assistant Dr. Mehmed Hassan, is focused on current issues corresponding to the theme of the announced competition. The following main scientific directions can be outlined in the presented publications:

- Construction of intelligent power systems with active-adaptive power grids C.3;
- Energy efficiency of distribution electrical networks (D.7.1; D.8.2; D.8.3; D.8.4; D.8.5; D.8.9; D.8.10; D.8. 12)
- Reliability of the power system (D.7.2; D.7.3)
- Joining decentralized generating sources in the Electricity System (D.7.1; D.8.1) and New technologies for converting renewable energy (solar energy, water energy and hydrogen energy) into electricity (D.8.8; D.8.11; D.8.13)

The candidate is the head of an intra-university scientific project at a research institute at the University "Prof. Dr. Asen Zlatarov"-Burgas on the topic "Degree of construction of decentralized energy sources in distribution active-adaptive electric networks".

He participated in the organizing committee of:

- Eighth national conference with international participation "Active-adaptive electrical networks-2022", 20-21.05.2022, Sliven;
- Ninth national conference with international participation "Active-adaptive electrical networks - 2023", 19-20.05.2023, Sliven.

The applicant's applied activity is certified by an official note from the "NAIS-SN" company, which confirms that he participated in the implementation of 3 contracts of the company.

Chief assistant Dr. Mehmed Hasan develops a broad scientific and applied activity, which fully corresponds to the theme of the announced competition.

5. Basic scientific, scientific-applied and applied contributions

5.1. Contributions to the monograph

The presented monographic work is on "Active-adaptive electrical networks". It is in a volume of 107 pages. The more important scientific-applied and applied contributions are:

- The most appropriate criterion for assessing the structural and functional reliability of active-adaptive electrical networks (AAEN) is substantiated.
- A new methodology has been developed for the analysis of structural and functional reliability, which allows to take into account the features of AAEN and the real limitations in their operation.
- A methodology has been created for the assessment of energy efficiency in AAEN. Achieving energy efficiency is obtained by reducing power losses in normal mode, ensuring the maintenance of normalized voltage values in nodes and compensation of reactive power in AAEN.
- An integral criterion for the effectiveness of AAEN is proposed, which combines functional reliability; energy efficiency and economic efficiency.

5.2. Contributions to the scientific works outside the monograph

The more important scientific-applied and applied contributions, distributed by direction, are the following:

✓ Energy efficiency of distribution electrical networks

- A mathematical model has been compiled for determining the optimal value of the power factor of synchronous motors by applying the mathematical theory for planning the experiment (D.7.1).
- A methodology and algorithm for determining the frequency in the power system after primary regulation with an additional load included are proposed (D.8.2).
- A methodology has been created for the statistical assessment of the indicators of asymmetry of currents and voltages in low-voltage electrical distribution networks (D.8.4).
- A methodology has been created for determining a correlation between the asymmetry indicators of the mode parameters and the duration of the interval for their reporting (D.8.5).

✓ Reliability of the power system:

- A methodology has been created to assess the reliability of devices for relay protection and automation and switching equipment when supplying electricity to a

user according to a scheme with automatic switching on of the backup power supply (D.7.2).

- The characteristics on the basis of which the indicators for evaluating the operational reliability of the Smart grid are selected are analyzed (D.7.3).

✓ Joining decentralized generating sources in the Electricity System and New technologies for converting renewable energy (solar energy, water energy and hydrogen energy) into electricity

- A mathematical model was created for determining the optimal value of the power factor of synchronous motors by applying the mathematical theory for planning the experiment (D.7.1).
- A methodology is proposed for a variant study of the connection of decentralized generating sources to the electrical distribution network under a pre-selected criterion (D.8.1).
- A methodology is proposed for variant research when choosing the power of a small hydroelectric power plant according to the selected static and dynamic criteria (D.8.11).

6. Assessment of the candidate's personal contribution

Of the evaluated 16 scientific papers Chief assistant Dr. Mehmed Hassan is the independent author of 14 (a monograph and 13 publications in conferences and journals) and co-author of two more journal publications. This gives me reason to say that a large part of the contributions are his personal work.

7. Critical notes and recommendations

I have the following critical comments on the reviewed materials:

- The materials are not prepared precisely enough. The reference statement contains publications and projects that do not meet the requirements of Law on the development of the academic staff in the Republic of Bulgaria or refer to other indicators and the points are increased. However, after the reduction, the University's minimum requirements remain met.
- 12 out of all 15 publications of the candidate outside the monograph are in the journal Izvestiya of TU-Sliven.
- Critical notes on the Electrical Machines teaching aids:

✓ Test answers are missing. Thus, students cannot quickly check their knowledge;

✓ Almost all questions have two possible answers. It would be good if there were at least 3 distractors;

✓ Some of the question texts are incorrect;

✓ It would be good to use other types of questions. For example, if matching questions are used in Part 1 Transformers, questions 2.1 to 2.10 are replaced with just one question. The same applies to questions 2.11 to 2.18. In this way, the volume of the teaching aids is artificially inflated;

✓ It would be good to use questions that test higher levels of knowledge and not just the reproduction of learning content.

My recommendation is that the candidate should publish more articles in publications, refereed and indexed in world-renowned databases and in English.

8. Conclusion:

On the basis of the analysis of the presented materials, of the overall scientific and teaching activity of Chief assistant Dr. Mehmed Hassan, I believe that he fulfills the requirements of the Law on the development of the academic staff in the Republic of Bulgaria, the Regulations for the application of the law on the development of the academic staff in the Republic of Bulgaria and the Regulations for the conditions and procedures for acquiring scientific degrees and holding academic positions at the University "Prof. Dr. Asen Zlatarov"-Burgas. In the works presented, there are enough scientific-applied and applied contributions for the appointment of academic position "associate professor". This gives me reason to positively evaluate his overall activity.

I recommend the honorable Scientific Jury to also vote positively and propose to the Faculty Council of the University "Prof. Dr. Asen Zlatarov"-Burgas to elect chief assistant professor Dr. Mehmed Kadir Hasan for "associate professor" in the field of higher education 5.Technical sciences, professional direction: 5.2.Electrical engineering, electronics and automation, scientific specialty "Electric power engineering (Electrical Networks and Systems)".

24.08.2023
Yambol

Reviewer:
/ Prof. Dr. T. Pehlivanova /