



REVIEW

by Professor Dipl. Eng. Rumen Kostadinov Popov, PhD at University of Plovdiv "Paisii Hilendarski"

on the materials, submitted for participation in the competition for taking the academic position of 'Associate Professor' at "Professor Assen Zlatarov" University – Burgas, in the higher education area 'Technical Sciences', professional field 5.2 Electric Power Engineering, Electronics and Automation, scientific specialty Electric power engineering (Electrical networks and systems), announced in State Gazette, issue 42/12.05.2023 with an only candidate, namely, Mehmed Kadir Hassan

1. General presentation of the received materials

By the order № РД-185/ 27.06.2023 of the Rector of "Professor Assen Zlatarov" University – Burgas, I was appointed a member of the Scientific Jury of the competition for taking the academic position of 'Associate Professor' in the higher education area 'Technical Sciences', professional field 5.2 'Electric Power Engineering, Electronics and Automation', scientific specialty Electric power engineering (Electrical networks and systems).

The only candidate, who has submitted documents for participation in the competition, announced in State Gazette, issue 42 of 12th May 2023 and on the Internet site of "Professor Assen Zlatarov" University is Head Assistant, Dipl. Eng. Mehmed Kadir Hassan, PhD.

The materials, submitted by Head Assistant Dipl. Eng. Mehmed Hassan, PhD, are in compliance with the Regulations for Development of the Academic Staff of "Professor Assen Zlatarov" University.

The candidate participates in the competition with:

- a monograph and 6 scientific publications, related to it;
- 17 scientific publications outside the topic of the monograph (3 of which published in refereed and indexed editions, worldwide known scientific databases and 14 – in non-refereed peer-reviewed journals or in collective edited volumes);
- 3 textbooks and 3 teaching aids;
- A list of projects in which the candidate has participated - 3 in number, and 1 project, managed by him and falling into the category "national scientific or educational project".

The listed scientific works of Head Assistant Mehmed Hassan, PhD, are outside his dissertation.

2. Brief biographical data about the candidate

Head Assistant Dipl. Eng. Mehmed Hassan graduated from the Technical University of Varna in 2000, obtaining the educational and qualification degree Master of Science in Electrical engineering. In the period 2010-2011 he specialized in the area of automotive electronics at Escuela de ofisio la Nucia, Espana (Spain), majoring in "Electrical and electronic systems in the car". In 2021 he defended at Sofia Technical University his doctoral thesis, titled "Optimal configuration of smart distribution electric grids" and obtained the scientific degree Doctor of Philosophy (PhD) in Electric power engineering (Electrical networks and systems), which corresponds to the scientific specialty for which the competition for "Associate Professor" has been announced.

Head Assistant Mehmed Kadir Hassan has over 28 years of teaching and research experience. His professional experience is completely sufficient in terms of the announced competition.

3. General characteristics of the candidate's activity

3.1. Assessment of the educational and pedagogical activity of the candidate

The pedagogical training of Head Assistant Dipl. Eng. Mehmed Kadir Hassan, PhD, is at a high level with in-depth theoretical and practical knowledge. His teaching activity is mainly focused on the scientific field of the announced competition. He has taught the following subjects: Electric machines (L/S), Electric apparatus (L/S), Electric power engineering (L/S) Renewable energy sources (L/S), Theoretical electro-techniques (-/S), Lighting equipment (-/S), Electrical equipment (L/S), Electrical measurements (-/S), Testing and reliability of electrical devices (L/S), Educational practice (/S), Electric drive (-/S), Electrotechnical materials (-/S), Mate- rials in electronics (-/S).

The participant in the competition has published three textbooks and three teaching aids for ensuring the learning process.

3.2. Assessment of the scientific activity of the candidate

3.2.1. Contributions in the scientific papers outside the monograph

The submitted scientific works for participation in the competition outside the monograph are 17 in number.

Head Assistant Mehmed Hassan, PhD, has 3 publications, refereed and indexed in Scopus and 29 noted citations.

The major **contributions** in these works are:

Scientific and applied contributions:

- A methodology and a mathematical model have been created to determine the optimum value of the power factor of the synchronous motors with the application of the theory of planning the experiment [Г.7.1].
- A methodology has been developed to assess the reliability of devices for relay protection and automation during automatic switching of the backup power supply [Г.7.2].
- A methodology for evaluating the operational reliability of Smart grid [Г.7.3], [Г.8.14].
- A methodology for the variant study of the process of joining decentralized generating sources to the distribution network [Г.8.1], [Г.8.6];
- Development of a methodology for the statistical evaluation of the indicators of asymmetry of currents and voltages in distribution networks for low voltage [Г.8.4] and to determine a correlation between the indicators of asymmetry of the mode parameters and their duration [Г.8.5];
- Compilation of a methodology for determining electricity losses in distribution networks in normal, asymmetric and non-sinusoidal modes [Г.8.9], [Г.8.10];
- Development of a methodology for variant research when choosing the power of a small hydroelectric plant [Г.8.11].

Applied contributions:

- Development of a methodology and algorithm for determining the frequency after primary regulation in the power system. [Г.8.2];
- Justification of an approach for choosing the means of automation in a Smart grid [Г.8.3];
- Making a modern assessment of: the most significant problems facing hydrogen energy [Г.8.7]; modern technologies for converting solar energy into electricity [Г.8.13]; the trends for the implementation of "smart" transformers in a Smart grid [Г.8.8], etc.
- Teaching and methodical contributions in the publications [E.23.1 - 3] and [E.24.1 - 3].

3.2.2. Contributions in the monograph

Scientific contributions:

- An integral criterion for evaluating the effectiveness of the active-adaptive electrical networks (AAEM) has been proposed, in combination with: the effect of increasing functional reliability; energy and economic efficiency.

Scientific-applied contributions:

- A new methodology for the analysis of structural and functional reliability has been developed, which takes into account the features of AAEM and the limitations in operating conditions.
- A new methodology for energy efficiency evaluation in AAEM has been proposed.
- A methodology has been created for the optimization of the integral efficiency criterion, which is useful for variant comparison of AAEM configurations.

Applied contributions:

- Selection of criteria for assessing the structural and functional reliability AAEM.

The contributions in the candidate's scientific works are significant.

The quantitative indicators of the criteria for occupying the academic position of 'Associate Professor' have been met.

4. Assessment of the candidate's personal contribution

The contributions achieved by Head Assistant Dipl. Eng. Mehmed Hassan, PhD, are due to his in-depth work in the research field and are useful for practice. I believe that the contributions of the candidate in the respective publications are his personal merit, as in 88% (15 out of 17) publications outside the monograph, he is the only author.

5. Critical remarks and recommendations

Here are some remarks on the presented scientific papers and materials:

1. Work [Г.7.2] „Hassan M.K. Reliability of functioning of devices in protective and switching equipment. E004, European Conference on Electronic Engineering (ECEE2022), Berlin, Germany / Yun 8-11, 2022“ cannot be accessed in SCOPUS by the moment of reviewing the submitted materials. For now, it can be only considered as a scientific publication in non-refereed peer-reviewed journals or in edited collective volumes. $20/1 = 20$ points. Thus, the total number of points for the author under group "Г" indicators is $2 \times 40/1 + 13 \times 20/1 + 2 \times 20/2 = 360$ points;
2. The projects specified in groups [E.18] and [E.20] cannot be classified as «national scientific or educational project». They are purely applied or intra-university ones.

3. The textbooks: [E.23.1] "Nedelcheva S.I., M.K.Hasan. Electrical energy from renewable energy sources. Part One. Wind power plants. ISBN 978-954-167-398-8, Sofia, TU-Sofia Publishing House, 2020", [E.23.2] "Nedelcheva SI, MK Hassan. Electricity from renewable energy sources. Part two. Hydroelectric plants. ISBN 978-954-167-459-6, Sofia. TU-Sofia Publishing House, 2021" and [E.23.3] "Nedelcheva S.I., V. Chobanov., M.K. Hassan. Electric energy from renewable energy sources. Part three. Photoelectric plants. ISBN: 978-619-167-491-6, Sofia. TU-Sofia Publishing House, 2022" are not listed in the - declaration - report of implementation of the minimum state and intra-university requirements.

Taking into account remarks 2 and 3, the total sum of points for the indicators in group "E" becomes: $2 \times 40 / 2 + 1 \times 40 / 3 + 3 \times 20 / 1 = 113.3$ points.

Despite the above remarks, the candidate covers with a sufficient reserve the minimal national and internal university requirements for occupying the academic position "Associate Professor" in the field of the announced competition.

6. Personal impressions

I do not know Head Assistant Mehmed Hassan in person. My impressions from him are entirely based on the submitted materials for participating in the competition mentioned above. I believe that he is a lecturer with a very good professional training and over 28 years of teaching experience. From the published scientific works and issued teaching aids, it can be seen that he is capable of working successfully both independently and in a team. The large number of independent scientific works makes a very good impression.

CONCLUSION

The documents and materials, submitted by Head Assistant Dipl. Eng. Mehmed Kadir Hassan, PhD, meet all the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation and the respective Regulations of "Professor Assen Zlatarov" University.

The candidate in the competition has presented a significant number of scientific papers published later than the materials used in the defense of the educational and qualification degree Doctor of Philosophy (PhD). The candidate's works contain original scientific and applied contributions. The theoretical developments have practical applicability.

The results, achieved by Head Assistant Dipl. Eng. Mehmed Kadir Hassan, PhD, in his teaching and research activities, fully comply with the specific requirements of "Professor Assen Zlatarov" University in Burgas.

The acquaintance with the presented for the competition materials and scientific works, the analysis of their significance and the achieved contributions allow me to give my **positive** assessment and **recommend** to the Scientific Jury to select Head Assistant Dipl. Eng. Mehmed Kadir Hassan, PhD, to hold the academic position of 'Associate Professor' at "Professor Assen Zlatarov" University in the professional field 5.2 Electrical Engineering, Electronics and Automation, scientific specialty Electric power engineering (Electrical networks and systems).

01.09.2023.

Reviewer:.....

(Prof. Dipl. Eng. Rumen Popov, PhD)