

OPINION

by competition for the academic position of "Associate Professor"
according to 5.2. Electrical engineering, electronics and automation",
announced in issue 42/12.05.2023.

with candidate: Chief assistant Professor Mehmed Kadir Hasan, PhD
by Prof. Dr. Eng. Kostadin Grozev Kostadinov - member of the scientific jury

1. General characteristics of the candidate's scientific and research-applied activities

In the competition for the academic position " Associate Professor" at the University "Prof. Asen Zlatarov, Ph.D., Burgas in the field of higher education "Technical Sciences", professional direction 5.2 "Electrical Engineering, Electronics and Automation", scientific specialty "Electroenergetics (Electrical Networks and Systems)" has submitted documents for participation Ch. assistant Dr. Eng. Mehmed Kadir Hasan.

Ch. Assistant Professor Mehmed Hassan participated in the competition with 27 publications, of which 3 in scientific publications in publications referenced and indexed in world databases with scientific information, 24 in non-indexed journals with scientific review; 1 monograph on which 10 independent publications were made; 3 textbooks and 3 teaching aids.

The aggregated number of points corresponding to the applied scientific works exceed the minimum national requirements for the " Associate Professor" competitions, as follows:

- indicator A: defended dissertation for the ONS "Doctor" (50 points);
- indicator C: monograph (100 points);
- indicator D: publications outside the monograph (380 points with minimum requirements of 300 points);
- indicator D: citations (110 points with minimum requirements of 100 points);
- indicator E: 3 textbooks and 3 teaching aids (120 points);
- indicator G: guided learning process for the last three years at the University "Prof. Dr. Asen Zlatarov" - Burgas exceeds the minimum requirements.

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

The pedagogical training of the Chief Assistant Professor Mehmed Hasan is at a high level. He has published 6 textbooks and teaching aids that are used in the educational process. The three textbooks are independent, and the three textbooks are co-authored with another author.

3. Main contributions

3.1. Contributions to articles outside the monograph

I accept the candidate's scientific, and research applied contributions to the competition as significant and well-formulated, namely:

- a new mathematical model for determining the optimal value of the power factor of synchronous motors in operating conditions with the application of the mathematical theory for planning the experiment. [D.7.1].
- a new methodology for assessing 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].
- confirmation of essential new aspects regarding the technical means by which the passive electrical network is transformed into a Smart grid and the selection of indicators for evaluating its operational reliability [D.7.3].
- a new methodology for a variant study of the connection of decentralized generating sources to the distribution network under a pre-selected criterion by constructing the desirability function for each of the influencing factors on the optimized parameter [D.8.1];

- obtaining confirmatory data according to a compiled methodology for statistical evaluation of the indicators of asymmetry of currents and voltages in distribution networks for low voltage [D.8.4];
- a methodology for determining a correlation between the indicators for asymmetry of the mode parameters and the duration of the interval for their reporting [D.8.5];
- a new methodology for choosing the optimal alternative for connecting decentralized energy sources to intelligent electricity distribution networks according to the justified criteria and restrictive conditions for carrying out the optimization [D.8.6];
- improved methodology for determining electricity losses in the elements of electrical distribution networks in normal, non-symmetric and non-sinusoidal modes [D.8.9];
- confirmatory data on the amount of electricity losses in distribution networks when the currents flow with the basic frequency, in non-sinusoidal and non-symmetric modes [D.8.10];
- a new methodology for variant research when choosing the capacity of a small hydropower plant according to the selected static and dynamic criteria [D.8.11];
- methodology for evaluating the operational reliability of the Smart grid [D.8.14].

I accept the research applied contributions in the candidate's materials as substantial and well formulated with two exceptions regarding D.8.7 and D.8.13, namely:

- a new methodology and algorithm for determining the frequency after primary regulation with an additional load included, useful for the purposes of mode management in the power system. [D.8.2];
- a justified approach in choosing the means for automation of distribution intelligent electric networks [D.8.3];
- analysis of the main problems for the future of hydrogen energy [D.8.7];
- a summary about the role of "smart" transformers in the smart grid and trends in their development [D.8.8];
- a technical solution for choosing the protective equipment, taking into account the requirement for protective resetting [D.8.12];
- overview of modern technologies for converting solar energy into electricity, trends in the development of photovoltaic technologies to achieve safe and reliable operation [D.8.13].

3.2. Contributions to the monograph.

I accept the scientific-applied and applied contributions of candidate Dr. Hassan in the monograph as substantial and well-articulated:

- The most appropriate criterion for evaluating the structural and functional reliability of active-adaptive electrical networks (AAEM) is justified.
- A methodology has been developed for the analysis of structural and functional reliability, which allows to take into account the features of AAEM and the real limitations in their operation.
- A methodology has been created for the assessment of energy efficiency in AAEM.
- An integral criterion for the efficiency of AAEM is introduced, which consists of: effect of increasing functional reliability; energy efficiency; economic efficiency. The optimization of the integral criterion for the efficiency of the AAEM is achieved by constructing the desirability function at fixed limits of variation of the influencing factors. The selected optimal value is used for variant comparison of different AAEM configurations.

4. Significance of research contributions for science and practice

The scientific papers submitted for participation in the competition by the candidate are on the announced topic of the competition. The obtained research results are significant both for the design and construction of AAEM, as a component of intelligent power systems.

7 citations in scientific publications, referenced and indexed in world-renowned scientific information databases and 20 citations in non-refereed peer-reviewed journals are presented.

10 independent articles were published on the monograph. Of the presented 14 publications outside the monograph, 12 are independent and only 2 have 1 co-author. This is proof that the participant in the competition is a built and independent experienced scientist.

5. Critical notes and recommendations

My remarks on the applied contributions in the candidate's scientific works are regarding 2 of all contributions (D.8.7 and D.8.13) as not clearly formulated or non-essential.

I recommend that in the future the results of Dr. Mehmed Kadir Hasan's research should be published mainly in publications, referenced and indexed in world-renowned databases of scientific information, having previously checked whether they can be protected by patents.

CONCLUSION

The scientific works presented by Dr. Hassan for participation in the above-mentioned competition contain significant and essential scientific and research applied contributions, which give me reason to confidently recommend that Dr. Mehmed Kadir Hassan occupy the academic position of "associate professor" in the professional direction 5.2. Electrical engineering, electronics and automation", in the specialty "Electroenergetics (Electrical networks and systems)" at University "Prof. Asen Zlatarov, Ph.D., Burgas.

21.08.2023, Sofia

JURY MEMBER:.....

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(Prof. Dr. Eng. Kostadin Kostadinov)