

STATEMENT OF OPINION

by **Professor Dipl.Eng. Stefka Ivanova Nedelcheva, PhD at TU-Sofia, FEP-Sliven,**

on the materials, submitted for participation in the competition for taking the academic position of **‘Professor’ at Plovdiv University “Paisii Hilendarski”** in the higher education area ‘Technical Sciences’, professional field 5.2 Electric Power Engineering, Electronics and Automation (Automated Information Processing and Control Systems)

The only candidate, participating in the competition for holding the academic position „Professor”, announced in State Gazette, issue 40 of 14th May 2021 and on the website of Plovdiv University "Paisii Hilendarski" for the needs of the Department of Electronics, Communications and Information Technology at the Physico-technological Faculty is Associate Professor Dipl. Eng. Rumen Kostadinov Popov, PhD.

1. General presentation of the submitted materials

By order No. P33-4298 of 10th August 2021 of the Rector of Plovdiv University "Paisii Hilendarski", I was appointed a member of the Scientific Jury of the competition for taking the academic position ‘Professor’ at PU in the higher education area ‘Technical Sciences’, professional field 5.2 ‘Electric Power Engineering, Electronics and Automation’, announced for the needs of the Department of Electronics, Communications and Information Technology at the Physico-technological Faculty.

The only candidate, who has submitted documents for participation in the announced competition is Associate Professor Dipl. Eng. Rumen Kostadinov Popov, PhD, from PU “Paisii Hilendarski”, Department of Electronics, Communications and Information Technology at the Faculty of Physics and Technology.

The materials, submitted by Associate Professor Dipl. Eng. Rumen Kostadinov Popov, PhD, are in compliance with the Regulations for Development of the Academic Staff of Plovdiv University. The candidate has submitted a total of 24 scientific papers, 10 scientific publications equivalent to a monograph, 1 book, 4 textbooks and teaching aids, 3 participations in national scientific or educational projects, 4 participations in international research, management of 1 international project and 1 national scientific research work. The listed scientific papers are not part of the doctoral thesis or of the associate professor habilitation works of the participant in the competition.

2. Brief biographical data about the candidate

Associate Professor Rumen Popov, PhD, has over 30 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 Assoc. Prof. Popov is at a high level with in-depth theoretical and practical knowledge. He has published 4 textbooks and teaching aids to ensure the learning process.

3.2. Assessment of the scientific activity of the candidate

3.2.1. Contributions in the scientific papers outside the list of publications, equivalent to a monograph

The submitted scientific works outside the list of publications equivalent to a monograph are 24. Of these, 10 are referenced and indexed in world-famous databases with scientific in-

formation (Web of Science, Scopus), 5 have a total Impact Factor of 1,145 and 14 publications are in non-referred journals with scientific reviewing.

Scientific contributions:

- Development of methods and algorithms for research and modeling of hybrid systems [Γ7.2, Γ8.7, Γ8.14], for identification of systems using artificial intelligence methods (genetic algorithm and algorithm for optimization with a swarm of particles) [Γ8.4, Γ8.5];
- Obtaining confirmatory facts [Γ7.1, Γ7.10].

Scientific and applied contributions:

- Creation of a mathematical model [Γ8.11] and assessment of the energy characteristics of a certain type of wind turbines [Γ8.9].
- Methodology for evaluating the efficiency of photovoltaic and thermal-photovoltaic solar panels [Γ8.12].

Applied contributions:

- Development of specialized systems and equipment [Γ7.3], [Γ7.5], [Γ7.6], [Γ7.7], [Γ7.8], [Γ7.9], [Γ8.2], [Γ8.3], [Γ8.10].
- Innovative research in the field of renewable energy sources [Γ8.1], [Γ8.8], [Γ8.13].

3.2.2. Contributions in the publications, equivalent to a monograph

The presented 10 publications, equivalent to a monograph, are referenced and indexed in the world-famous databases with scientific information Web of Science and Scopus.

The major **scientific contributions** in them are the following:

- a new hybrid approach and method for measuring the efficiency of vertical ground-based heat exchangers [B4.6];
- a new set of virtual tools in the LabVIEW™ environment with an ability to calculate measurement uncertainty and test statistical hypotheses [B4.7];
- a new 3D mathematical model of the process of conducting a test to determine thermal characteristics [B4.10];
- new models and 3-D numerical simulation studies for forecasting the thermal behavior of heat accumulators with paraffin and assessment of the factors, influencing on the heat transfer [B4.2, B4.3];
- new classification and characteristics of thermo-physical indicators [B4.1];
- systematic comparison between field and laboratory tests to determine the thermal characteristics of ground-based heat exchangers [B4.5].

The mentioned papers with scientific contributions have over 102 noticed citations on the merits: [B4.6] - 5 citations; [B4.7] - 5; [B4.10] - 3; [B4.2, B4.3] - 6; [B4.1] - over 48; [B4.5] - over 35. Each of the scientific papers with scientific contributions is with an Impact Factor. The total Impact Factor of the 10 publications is 33,136.

Scientific and applied contributions:

- modeling of shallow geothermal energy accumulators and determination of the additional influencing factors [B4.9].

- methodology for determining the energy efficiency of the different modes of a small-sized hybrid installation [B4.8];
- analysis of experimental measurements of thermal parameters [B4.6, B4.10].

The indicated papers with scientific and applied contributions have 14 observed citations: [B4.8] - 11 citations; [B4.9] - 3.

Applied contributions:

- overview and comparative analysis of the types of heat storage systems [B4.4.];
- development of a latent heat accumulator [B4.1], [B4.2], B4.3].

Paper [B4.4.] from the list of paper works with applied contributions has 10 registered citations.

The contributions in the candidate's scientific works are significant. The quantitative parameters of the criteria for holding the academic position "Professor" are met. Some of the parameters are exceeded. Based on the presented publications and the large number of citations, it can be claimed that the recognition of the candidate by the scientific community at home and abroad is indisputable.

4. Assessment of the candidate's personal contribution

The contribution of the candidate in the respective publications is his personal merit.

5. Critical remarks and recommendations

I have no significant remarks on the presented scientific works. I recommend the publication of a bigger number of textbooks and teaching aids, which will be useful in training students, as well as the publication of independent scientific papers.

6. Personal impressions

My impressions of the participant in the competition are excellent and gained from our joint work with PhD students. He is an honored lecturer, who enjoys respect among colleagues and students. Extremely impressive is the large number of scientific papers abroad with an Impact Factor and with a reference to the Web of Science and Scopus.

CONSLUSION

The documents and materials, submitted by Associate Professor Rumen Popov, PhD, **meet all the requirements** of the Law for the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for implementation of ZRASRB and the respective Regulations of Plovdiv University "Paisii Hilendarski".

The candidate in the competition has presented a significant number of scientific papers published after the materials, used in the defense of his educational and qualification degree 'Doctor of Philosophy' and his habilitation works for taking the academic position 'Associate Professor'. The candidate's works contain original scientific and applied contributions, which have received international recognition. His theoretical developments have practical applicability and some of them are directly oriented to the educational practice. The scientific and teaching qualification of the participant in the competition is unquestionable.

The results, achieved by Assoc. Prof. Rumen Kostadinov Popov, PhD, in his teaching and research activities fully comply with the specific requirements of the Physico-technological Faculty,

adopted in connection with the Regulations of the University of Plovdiv for the implementation of ZRASRB.

The acquaintance with the presented for the competition materials and scientific works and the analysis of their significance and achieved contributions allow me to give my **positive** assessment **and recommend** to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Physico-technological Faculty for choosing Associate Professor Rumen Kostadinov Popov, PhD to hold the academic position of 'Professor' at Plovdiv University “Paisii Hilendarski” in the professional field 5.2 Electrical Engineering, Electronics and Automation (Automated Information Processing and Control systems).

26 September 2021

Author of the statement of opinion:

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