

OPINION

of Eng. **Stepan Garo Akerian** PhD, DSc

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on the materials submitted for participating in a competition for the occupation of the academic position of “**Associate Professor**” in Plovdiv University “Paisii Hilendarski” in the Higher education area 5. Technical sciences;
Professional field 5.1 Mechanical engineering
(Automation of engineering work and Systems for automating design)

The competition was proclaimed in Bulgarian ‘State Gazette’, issue 32 of 09.04.2024 and at the site of Plovdiv University “Paisii Hilendarski” (PU) for the needs of the department of Mechanical Engineering and Transport to the Physico-technological faculty. The single candidate is Chief Assistant Professor Eng. **Emil Georgiev Velev** PhD from the same department in PU.

1. **General overview of the procedure and the candidate**

The single candidate Dr. Velev submitted a pack of materials in electronic format for the competition above described. This pack comprises 21 scholarly papers and a monograph as they are presented as PDF files. All presented papers are accepted for reviewing as they are in the field of this competition and they are not a part of his PhD thesis. Three of his publications are indexed in the Scopus. Nine of scholarly papers were written in English and the rest – in Bulgarian. Seven of these papers represent printed reports of scientific events, the rest are publications in scholarly journals and academic annuals. Three of scientific works are in the press. It is submitted a list with two research projects funded by the PU in which the candidate was involved. His total professional experience in the field of mechanical engineering is about 30 years. He has over 8 years teaching and research experience in the department of Mechanical Engineering and Transport. He obtained the PhD degree in the professional field nine years ago. Dr. Velev is not personally known to me.

2. **General characteristics of the activities of the applicant**

For *the educational activities and pedagogical expertise* of Dr. Velev I could judge mainly from the the attached list of his academic commitments in the period of 2019-2023. He has lectured four bachelor courses as two of them are closely related to the scientific specialty of this competition. The applicant has also conducted laboratory and seminar exercises for other seven disciplines. All these disciplines are in the professional field 5.1 Mechanical engineering. Dr. Velev supervised six students who prepared diploma projects. He took a part in the updating of some Curriculums and Study programs for bachelor and master courses. Certificates for his involvement in three interna-

tional programs related to modern approaches in the education should be also mentioned. All this shows that the candidate has established himself as a wide-ranging teacher on whom the department can rely. However, I could not find any textbook and teaching aid developed and published by the candidate in the presented materials.

The *scientific production* submitted for the competition includes one published monograph self-authored and 21 scientific works. I find 14 publications in scholarly journals and academic annuals, and seven printed papers reported on scientific forums. Three of these publications are indexed in the Scopus as two of them are in a journal with a CiteScore index of 0.4 and the third – with an index of 0.9. Nine of these scholarly papers were written in English and the rest – in Bulgarian. Ten (or almost half of them) of his scientific works are self-authored. The candidate has a paper with another co-author and three papers have two other co-authors. The rest scientific works have more than three co-authors. Four of the presented scientific communications could be classified as popular scientific ones for with-it plastic materials and products and 3D-printers for metal as well. Two of the submitted papers are relate to a sophistication of teaching methodology by employing new technical facilities. Considering the high share of self-authored scientific works of the candidate, I may judge for his considerable personal contribution. The circumstance that ten of the scientific works have three or more co-authors speaks to the candidate's ability to collaborate and work in large research teams.

The applicant's *contributions* are preeminently scientific-applied ones. They are mainly related to his research on the gerotor hydraulic motors with cycloid gear pairs in various aspects such as the design of new cycloid gear pairs, deciphering the existing ones and a study on the cavitation in these hydromotors. I find a fruitful extension of his doctoral research. In the scientific-applied contributions I subsume the demonstrated ability for designing injection molds in which can be produced details from different types of plastic. A particular one relates to the research on the intake diameter of injection mold for manufacturing two types of plastics through a hot nozzle. I assume the introduced methodology for restoring gerotor pumps as an engineering-applied contribution. Some of the citations, pointed from the applicant, support these contributions.

The topic of the submitted monograph with a volume of 189 pages for “Production of metal parts using additive technologies” is up to date and it represents growing interest. The first seven chapters in a volume of 145 pp. represent a good overview of the fundamentals of 3D printing, the used software products, technologies, materials and the 3D-printers themselves. In the chapters 8 and 9 in a volume of 38 pp. the author described the design and fabrication of experimental text samples from two types of steel with different filling configuration in their cross section and their subsequent tensile testing. However, the monograph itself is not upheld by previous publications that approve these results. The experimental results themselves are presented in a rather crude form and there is

no meaningful discussion. An overview publication in a reputable and specialized scientific journal with IF is possible to be written on the base of the collected materials for the chapters 1 to 7. However, the volume and type of the cited sources in the monograph seem too simple for the above purpose. For that, it is quite difficult for me to perceive this monograph as a habilitation work.

The candidate submitted only a list with 14 his scientific works that are *cited* from other Bulgarian researchers. I expect to find the full-text sources that citing the candidate scientific works in the competition's materials. All citing sources are from the period of 2022-24. Two of his publications indexed in the Scopus are cited in a Monograph of Bulgarian author from 2024. The rest of citing sources are mainly reports in scientific conferences and academic annuals. For that these citations are not enough respectful for me.

In the competition's materials there is also a list with two research projects funded by the PU and in which the Dr. Velev was involved. I expected to find an annotation for them. In these materials, I did not also find information and documents about obtained patents and implementations in industrial practice.

3. Critical remarks and recommendations

Firstly, I should encourage Dr Velev to increase his publication activity in reputable journals with an Impact Factor or a Citescore and to write and publish textbooks and teaching aids. Secondly, I recommend the bibliographic description of scientific works and other cited sources to be comprehensive and their format to be unified in all submitted materials and documents.

CONCLUSION

On the basis of the scientific works and other materials submitted for the competition, the results obtained in the educational and research activities, as well as the scientific-applied and engineering-applied contributions, I give my positive assessment and suggest the scientific jury to offer to the attention of the Faculty Council of the Faculty of Physics and Technology following: the Chief Assistant Professor Emil Georgiev Velev PhD to be elected to the academic position of 'Associate Professor' in PU "Paisii Hilendarski" in the higher education area 5. Technical sciences; the Professional field 5.1 Mechanical engineering and the scientific specialty "Automation of engineering work and systems for automating design".

August 19th, 2024

Plovdiv

Member of scientific jury:

(Prof. Stepan Garo Akerian DSc)