REVIEW

By: **assoc. prof. Daniela Simeonova Toneva, PhD,**
dept. "Ecology and Environmental Protection", Technical University - Varna

on a competition for the academic position of "Professor" in the field of higher education 5. Technical Sciences, professional field 5.5. Transport, Shipping and Aviation, scientific specialty "Transport and storage of oil, gas and solid mineral products" announced at the Department of Engineering and Technologies in Transport and Mechanical Engineering, Faculty of Technical Sciences at the University "Prof. Dr. Asen Zlatarov" - Burgas, with candidate Assoc. prof. eng. Yordanka Tsankova Tasheva, PhD.

The review was prepared on the basis of Order No. RD-236/15.07.2024. of the Rector of the University "Prof. Dr. Asen Zlatarov" - Burgas for the appointment of a Scientific Jury, issued on the basis of Art. 4, para. 2 of the Law on the development of academic staff in the Republic of Bulgaria, in connection with the announced by the University in the State Gazette No. 43/17 May 2024 Competition for the academic position of "Professor" in the field of higher education 5. Technical Sciences, professional field 5.5 Transport, Shipping and Aviation, scientific specialty "Transport and Storage of Oil, Gas and Solid Mineral Products" and Protocol No. 1 of 29.07.2024. from a meeting of the Scientific Jury.

I received the necessary documents and materials in due order in electronic form.

According to the announced competition, the candidate is assoc. prof. eng. Yordanka Tsankova Tasheva, PhD. The submitted documents and scientific papers are in accordance with the regulatory requirements for occupying the academic position of "Professor". No violations were found in the competition procedure.

1. General provisions and curriculum vitae for the candidate

Assoc. prof. Dr. eng. Yordanka Tsankova Tasheva was born on 28.09.1974 in the town of Burgas. In 1998. she graduated with a master's degree in chemical technologies with a professional qualification of Chemical Engineer and specialization in Petroleum Technology and Chemical Engineering, as well as a second degree in Industrial Management (Diploma of Higher Education for master's degree with registration No 004052/1998 issued by the University "Prof. Dr. Asen Zlatarov" - Burgas). Since 2006 she has been a PhD in the scientific specialty 02.10.23 "Technology of Natural and Synthetic Fuels" after successfully awarding the educational and scientific degree "doctor" for dissertation on "Methods for Obtaining Ecological Medium Distillate Fuels" (Diploma for Doctoral Degree No. 30335/06.04.2006, issued by the Higher Attestation Commission). In the period 2005-2006 she was a part-time assistant professor at the Department of Production Technologies at the University "Prof. Dr. Asen Zlatarov", Burgas. From 2006 to 2011, he held the academic positions of "assistant" and "head. assistant" in the Department of "Industrial Technologies and Management". Since 2011, after winning a competition, he holds the academic position of "Assoc. Professor" in the same department until now. A Certificate from the University "Prof. Dr. Asen Zlatarov" - Burgas with No. 1845/31.05.2024 with assurance that Assoc. Prof. Dr. Eng. Yordanka Tsankova Tasheva works as a teacher with an employment contract from No. 645/20.04.2006 until now at the University. Assoc. Prof. Tasheva is included in the Register of habilitated persons with scientometric indicators as an associate professor in Professional direction 5.10. Chemical Technologies.

Faculty Council and actively participates in the work of various faculties at the University: member of the Colloquium of the Faculty of Social Sciences at the University "Prof. Dr. Asen Zlatarov" - Burgas (2015-2019), and from (2019-2023) she was elected as a member and secretary:

member and secretary of the Attestation Commission of the Faculty of Social Sciences for the period (2019-2023) year: member of the FS of the Faculty of Technical Sciences for the period (2019-2023) year: member of the FU of the Faculty of Social Sciences for the period (2023-2027) year: member of the FU of the Faculty of Social Sciences, member and secretary of the Attestation Commission of the Faculty of Social Sciences for the period (2023-2027) and member of the Colloquium of the Faculty of Social Sciences for the period (2023-2027).

Assoc. Prof. Tasheva is the author of numerous scientific publications - monographs, articles, reports, teaching aids and textbooks. She participated in the implementation of scientific research projects related to the professional direction of the current competition.

2. General description of the presented materials

The candidate for the academic position "Professor" Assoc. Ph.D. Eng. Yordanka Tsankova Tasheva has attached all the necessary documents certifying the fulfillment of the minimum national requirements according to the current: Law on the Development of the Academic Staff in the Republic of Bulgaria, Regulations for the Implementation of the Development Law of the academic staff to it and Regulations on the terms and conditions for holding academic positions at the University "Prof. Dr. Asen Zlatarov" - Burgas.

For participation in the competition, 44 scientific publications, 1 monograph, 1 textbook and 2 manuals were submitted in addition to the publications submitted for obtaining the title of "doctor" and the academic position "associate professor":

- Y. Tasheva, A. Dimitrov, Ecological use of natural and synthetic fuels and their waste - monograph. Libra Scorp, Burgas, 2024, 296 pages, ISBN 978-619-273-031-4;
- 10 pcs. scientific publications published in refereed and indexed editions, world-famous databases with scientific information (C.4. 1., C.4.2 , C.4. 3., C.4.4, C.4. 6., C.4.7, C .4.8., C.4.9 and C.4.10);
- 10 pcs. scientific publications published in refereed and indexed editions, world-famous databases with scientific information (from D.7.1. to D.7.10 inclusive);
- 24 pcs. scientific publications published in non-refereed editions with scientific review or in edited scientific volumes (from D.8.1. to D.8.24 including);
- Tasheva, J. Operating materials and characteristics in transport, 2023, Libra Scorp, 180 pages, ISBN 978-954-471-996-8. The textbook is for training students in the disciplines: "Operational materials in transport", "Operational characteristics of fuels and oils" and "Operational materials and ecology";
- Tasheva. Y., A. Dimitrov. Chemistry and Technology of Petroleum and Petroleum Products Laboratory Manual, 2020, Libra Scorp, 204 pp. ISBN 978-954-471-694-3;
- Tasheva. Y., A. Dimitrov. Performance and Environmental Performance of Oils, 2024, Libra Scorp, 136 pages, ISBN 978-619-273-045-1.

From the attached 44 scientific publications in 21 nos. the candidate for AP "professor" is the first author, of which 9 nos. are independent and 15 pcs. is second author. So far, 25 items have been noticed on the publications of the competition. citations in the refereed and indexed publications in the world databases with scientific information (Scopus/Web of Science).

From the presented materials, no monograph is reviewed because it was reviewed before its printing. Study materials and the candidate's participation in projects are also not reviewed. All of these will be taken into account in the final evaluation of the applicant.

All documents are submitted in the required form on an electronic medium: abstract of a dissertation for the award of the ESD "Doctor"; monographic work C.3.1; scientific publications under Indicator C (publications under the numbers from C.4.1. to C.4.10.); according to Indicator D (presented under the numbers from D.7.1. to D.7.10., as well as from number D.8.1 to D.8.24.); according to Indicator D (from D.12.1. to D.12.25.); by Indicator E (from E.17.1. to E.17.3.; from E.19.1 to E.19.3; from E.20.1. to E.20.3.; E.23 and E.23.1., as well as E.24, E.24.1. and E.24.2.); author reference of the contributions of the scientific works; a reference to the candidate's research and applied

activity; certificate of compliance with the minimum requirements under the competition for employment of JSC "Professor"; reference for lectures given by the candidate for the last six full academic years, given at the University "Prof. Dr. "Asen Zlatarov" - Burgas, in academic disciplines from the professional direction of the competition.

Declarations of equal participation in co-authorship have been submitted for 15 scientific works in number as well as for the monograph with a content of 296 pages. Since the applicant has not submitted a separate protocol for co-authorship of all scientific publications, I assume that they are equal for all authors.

The scientific publications that are not included in the monographic work can be grouped in the following thematic areas related to the professional direction of the competition:

• Research and comparison of different compositions of petroleum fuels on fuel consumption, as well as corresponding assessment of the influence of the composition of different fuels on the efficiency of the car when using intelligent control and management systems and comparing the influence of the change in the composition and operational indicators of fuel on the power, economic and environmental indicators of the engine (C.4.2., C.4.6, D.7.6., D.7.7., D.8.2, D.8.4);

• Modern technologies for improving the yield of products from primary oil processing, as well as the operational and environmental characteristics of fuels and oils by improving their composition on the one hand by cleaning them from unwanted components by an alternative method, and on the other by adding various additives of petroleum and non-petroleum origin to various petroleum mixtures and their research and analysis accordingly (B.4.1., B.4.3., B.4.4., B.4.5, B.4.9., B.4.10., D.7.1 ., D.7.2., D.7.3., D.7.4., D.7.8., as well as publications under indicator D.8, as follows: D.8.1., D.8.8, D.8.10, D.8.11 , D.8.12, D.8.13, D.8.14., D.8.15 ..... including D.8.23).

• Assessment of the impact of the use of fuel-lubricants and transport on ecology and environmental protection and human health (C.4.7., C.4.8., D.7.5, D.8.3, D.8.4, D.8.24.).

The candidate Assoc.Prof. Tasheva has fulfilled the minimum national requirements for occupying the academic position of "professor" in the field of higher education 5. Technical sciences, professional direction 5.5 Transport, shipping and aviation, specified in the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Rules for application of the law on the development of the academic staff to it, as well as the Regulations on the terms and conditions for occupying academic positions at the University "Prof. Dr. Asen Zlatarov" - Burgas.

With a minimum requirement of 1150 points by indicator group for the academic position "professor", the candidate's total number of points is 1390.37 points. The points for Indicator A are 50 with the required 50, for Indicator B (B.3 to B.4) are 302 with the required 200. The sum of the points for indicator D (D.7 and D.8) are a total of 568.37 with the required 500, according to the Regulations of the University "Prof. Dr. Assen. Zlatarov". The sum of the points under indicator D (E.12) is a total of 250 with a required 100. The sum of the points under Indicator E (E.17, E.19, E.20, E.23 and E.24) is 220, with a required 200.

3. General characteristics of the candidate's research and scientific-applied activity.

A reference was presented by Deputy. rector of research and project activities of the University "Prof. Dr. Asen Zlatarov"- Burgas Assoc. Dr. Svetlana Zheleva for the participation of Assoc. Dr. Eng. Yordanka Tsankova Tasheva in research projects, from which it is clear that she is the head of 3 research projects and participates in the implementation of 5 more contractual topics, namely:

Scientific leader of intra-university projects:

• Contract No. NIH-391/2017 on the topic "Research of the composition of heavy oil fractions", (2017-2018), financed by the NHTD fund;

• Contract No. NIH-383/2015 on the topic "Obtaining a high-octane additive by modifying alkenes" (2015-2016), financed by the NHTD fund;

• Contract No. NIH-276/2012 on the topic "Obtaining commodity automobile gasoline through alternative methods", financed by the NHTD fund.

Member of a scientific team in the following contractual topics:

• Contract No. NIH-296/2013 on the topic "Prediction of the biodegradation and toxicity of some sulfur compounds and arsenic hydrocarbons of petroleum origin with supervisor Assoc. Dr. Yana Koleva, financed by the NHTD fund:

• Contract No. NIH-301/2013 on the topic "Influence of bio-components on the physicochemical and operational properties of commodity gasolines" (2013-2014) with supervisor, Assoc. Dr. Todor Palichev, financed by the NHTD fund:

• Contract No. NIH-461/2021 on the topic "Research of parameters characterizing the comfort of a car (2021-2022), with head ch. associate professor, Dr. Zlatin Georgiev, financed by the NHTD fund:

• Contract No. NIH-464/2022 on the topic "Research of performance characteristics of sensors and reliability of fuel nozzles for new and used cars", (2022-2023), with supervisor Assoc. Dr. Magdalena Dylgerova, financed by the NHTD fund:

• Contract No. NIH-480/2023 on the topic "Study of exhaust gas recirculation system and the level of harmful emissions from cars in an urban environment, (2023-2024) headed by Assoc. Dr. Vasil Bobev, financed by the NHTD fund.

From the reference it is clear that the candidate for JSC "Professor" for the period (2018-2023) is the head of the team from the University participating in 3 National scientific and educational projects financed by the National Research Fund, as well as a member of 3 Scientific and educational projects financed by European funds.

My assessment of the candidate's scientific research and applied scientific activity is positive.

4. **Evaluation of the pedagogical preparation and activity of the candidate.**

The candidate has extensive pedagogical experience in teaching students for the Professional Bachelor's, Bachelor's and Master's degrees. A report on the candidate's lectures for the last six years is presented: for (2018-2019) - 435 hours; (2019-2020) - 465 hours; for (2020-2021) - 435 hours; and for (2021-2022) - 624 hours; for (2022-2023) - 876 hours; and for (2023-2024) - 825 hours. She gave lectures on study subjects included in the curricula for the OCS "professional bachelor": "Operating materials and characteristics of fuels and oils" and "Operating materials and ecology"; for EQD "Bachelor": "Operating Materials in Transport", "Oil and Gas Technology", "Petroleum Chemistry", "Commodity Science", "Medical Commodity Science", "Enterprise Economics" and for EQD "Master": "Technology of Oil and Gas," "Oil and Gas Chemistry and Technology," "Small Business Management," Tax Warehouse Technology," and "Oil and Gas Construction." She participated in the development and updating of 24 items. curricula, which is a certificate for the professionalism, competence and pedagogical training and experience of Prof. Tasheva.

3 certificates are presented for increasing the qualification of the candidate in 2022 by projects: for successfully completed studies in English, level A1 - A2 - 160 hours; in "Skill to develop, implement and manage digital educational content" and successful training in "Ecological monitoring and applications of the ecosystem approach in the protection of water and the marine environment", which shows the candidate's desire for continuous improvement.

For the period from 2013-2023, he was the scientific supervisor of 27 units. successfully defended diploma projects in the special "Transportation Technology and Technologies" - 9 units, in "OHT - Oil and Gas Technology" - 17 units. and on the special "Technology and management of the oil and gas industry" - 1 pc.

Assoc. Prof. Ph.D. Eng. Yordanka Tsankova Tasheva is the supervisor of two successfully defended doctoral students:

• Master Eng. Anton Todorov Palichev, on the topic "Modern trends in the production of automobile gasoline" in the doctoral program "Technology of natural and synthetic fuels /sh. 02.10.23/ from Mon 5.10. Chemical technologies, field of higher education 5. Technical sciences protected on 07/08/2015.

• Master Eng. Dimitrinka Slavova Ivanova on the topic "Investigation of pollution with road sediment along main and secondary transport arteries" in the city of Burgas" in the doctoral program "Ecology and environmental protection" from PD 4.2. Chemical sciences area of higher education 4. Natural sciences, mathematics and informatics protected on 04.11.2022.

My overall assessment of the candidate's educational and pedagogical preparation and activity is positive.

5. Basic scientific and scientific-applied contributions

The presented monograph examines the pollution of the environment, which leads to the violation of ecological norms. It has been established that of all energy sources, 40% is obtained from oil, with 20% of the planet's pollutants being from oil products. The slow but sure destruction of the environment is the reason for an innovative approach in the production of fuels. The implementation of innovative methods and installations for the processing of solid fuels, oil products and their waste, as well as the release of minimal amounts of harmful emissions (CO2), will preserve the environment. The topic of the monograph is relevant because it is related to the problems of reducing harmful emissions in the atmosphere during the production of petroleum products and preserving the environment. The main objective of the monograph is to present the new trends in the production of modern liquid fuels, in the processing of solid fuels, synthetic oil and waste and fuels from waste. The main scientific and scientific-applied contributions of the monograph presented in the current competition are summarized in the concluding point of the latter, namely: on the one hand, compliance with European directives and the search for new alternative sources of liquid fuels for transport or obtaining liquid components from low-calorie raw materials, their utilization, thus reducing harmful emissions, and on the other hand obtaining electricity from waste or fuels obtained from waste, which would be competitive on the free market.

Contributions are considered separately for the monographic work under indicator B and contributions for the presented scientific works under Indicators C.4., D.7 and D.8.

They are formulated and can be summarized in two groups: as scientific and scientific-applied contributions.

5.1. Contributions to the monographic work

A monographic work "Ecological use of natural and synthetic fuels and their waste" (COBISS.BG-ID - 67165448) was submitted for participation in the competition. I accept the two scientific and scientific-applied contributions formulated in the monograph, namely:

1. On the one hand, the possibility of complying with the European directives and more accurately applying the Circular Economy Directive is shown by presenting various alternative sources of liquid fuels for transport or obtaining liquid components from low-calorie raw materials, their utilization, thus harmful emissions also decreased.

2. Possibilities to obtain electricity from waste or fuels obtained from waste, which will be competitive in the free market.

5.2. Contributions of publications under Indicators D.7 and D.8

The contributions of the scientific works of Assoc. Ph.D. Eng. Yordanka Tsankova Tasheva are presented in three groups: scientific, scientific-applied and applied based on scientific works according to Indicators C.4, D.7 and D.8. Of the presented 5 pcs. scientific contributions I accept No. 1, No. 2. No. 3 and No. 4. I do not accept contribution No. 5 as it is probably based on implemented projects: internally - university, national and international. This contribution may be considered to be refined and included in the applied contributions. I accept the presented scientific and applied contributions, and I do not accept contribution #3 from the applied contributions.

5.2.1. Scientific contributions

I accept the following formulated scientific contributions arising from the candidate's scientific output:

• It has been proven that the processes of extraction, adsorption and oxidation of various models of mixtures, gasoline and middle distillate fractions are thermodynamically stable (laboratory processes of individual systems are irreversible and non-spontaneous, i.e. possible. (C.4.9., D.7.1 ., D.7.9., D.8.10., D.8.14., D.8.15, D.8.16, D.8.17, D.8.19, D.8.24.)

• The thermodynamic and kinetic parameters of various systems were obtained: gasoline, middle distillate fraction (diesel fuel, gas oil); polar solvent, or adsorbent or oxidizer. From the obtained results for free energy n Gibbs, enthalpy and entropy, it is proved that the dissolution process is irreversible and spontaneous. (D.7.3., D.7.4., D.7.8., D.810., D.8.18)

• Gasoline-ethanol mixtures containing bioethanol of two base petroleum gasolines having different component and carbon composition were investigated. It was found that the base petroleum gasoline meets all the requirements of BDS EN 228 and the Ordinance on the quality requirements of liquid fuels, the conditions, the procedure for their control. (D.7.2., D.7.10., D.8.1., D.8.2., D. 8.4., D.8.7., D.8.8., D.8.10.)

• The addition of bioethanol to petroleum gasolines has been shown to alter the distillation characteristics of the base gasolines. This change is most pronounced up to 70°C and to a lesser extent up to 100°C (D.8.10).

5.2.2. Scientific and applied contributions

I accept the following scientific and applied contributions:

• A methodology for researching the influence of fuel on the consumption of Opel Movano and Ford Transit trucks has been compiled. The influence of the indicators cetane index, density, kinematic viscosity and content of polycyclic arenes on the combined consumption of fuel at a petrol station was investigated. The obtained results show that PG and CM 1 have the best combined consumption, CM3 and CM2 occupy an intermediate position, and PG1 shows a worse characteristic (D.7.6.).

• A methodology for researching the influence of fuel on the fuel consumption of selected MAZDA model cars was created and the influence of the indicators cetane index, density, kinematic viscosity and content of polycyclic arenes on the combined fuel consumption at a petrol station was studied (D.7.7).

5.2.3. Applied Contributions

For contributions of applied nature and high importance, I accept the following:

• Comparative tests were carried out in order to determine in bench conditions, the value of the powers (effective torque - Me, average effective pressure - re and effective power Ne), economic (hourly Gg and specific - g is consumption of diesel fuel) and toxic (content of: carbon monoxide - CO; carbon dioxide CO2; hydrocarbons - CH; nitrogen oxides - NOx; oxygen O2 and smokiness - Rh of exhaust gases) performance of a diesel engine when operating with standard diesel fuel and treated diesel fuel through the extraction processes and adsorption. (C.4.2).

• Based on the obtained experimental results from the bench tests, it was established that the operation of a Volkswagen 1.9 diesel engine with processed diesel fuel does not lead to changes in its effective indicators (C.4.6).

6. Significance of contributions for science and practice.

The indicated results and contributions are distinguished by high significance, both for science and for practice. The scientific publications of Prof. Dr. Eng. Yordanka Tsankova Tasheva have become available to the scientific community working in PN 5.5 Transport, shipping and aviation in the field of higher education 5. Technical sciences. They have been reported at scientific Conferences with international participation, seminars and publications in refereed and indexed editions in world-renowned databases of scientific information (Scopus/Web of Science) or in non-refereed journals with scientific review or in edited collective works. In the scientific publications, citations according to Indicator D.12 - 25 numbers have been noticed so far.

7. Critical notes and recommendations.

The analysis of the submitted materials for participation in the competition for AP "Professor" shows no gaps, which is why I believe that it is not necessary to make critical comments and recommendations.

8. Personal impressions and opinion of the review.

My personal impressions after familiarizing myself with the materials provided to me and formulating the review are that the candidate for the academic position "professor" is a built academic teacher, researcher-scientist with a very good theoretical and professional training in a wide range of the professional direction 5.5 Transport, shipping and aviation and scientific specialty "Transport and storage of oil, gas and solid mineral products".

CONCLUSION

Assoc. Prof. PhD eng. Yordanka Tsankova Tasheva is a scientist with extensive research, teaching and administrative experience, with high scientific and public recognition. The presented scientific production meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations for the Terms and Conditions for Occupying Academic Positions at the University "Prof. Dr. Asen Zlatarov" - Burgas, exceeding the minimum requirements for holding the academic position of "professor" according to scientometric indicators.

After familiarizing myself with the materials and scientific works presented in the competition, and the analysis of her scientific production, I can confidently give a positive assessment and propose to the respected Scientific Jury to award Associate Professor Yordanka Tsankova Tasheva the academic position of "Professor" in field of higher education 5. Technical sciences, professional direction 5.5 Transport, shipping and aviation, scientific specialty "Transport and storage of oil, gas and solid mineral products", for the needs of the department "Technology and technologies in transport and mechanical engineering" at the Faculty in technical sciences at the University "Prof. Dr. Asen Zlatarov" - Burgas.

Date: 25.09.2024

REVIEWER:
/ assoc. prof. Daniela Toneva, PhD/