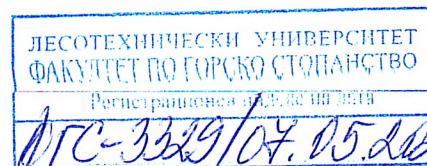


## REVIEW



on the materials submitted for participation in a competition for „**Professor**“ in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.5 Forestry, scientific specialty „Machinery and equipment in the forestry, logging, woodworking and furniture industries“ in the discipline „Forestry transport“

In the competition for professor, published in the State Gazette No. 7 of 24.01.2025 and on the site of the University of Forestry with the code FOR-P-0125-155 for the needs of the Department of Forestry Technology and Mechanization at the Faculty of Forestry, as a candidate participate Assoc. Prof. Dr. Stanimir Yordanov Stoilov, Faculty of Forestry, Department of Forestry Technology and Mechanization.

**Reviewer:** Prof. Zhivko Bonev Gochev, Ph.D., Professor in a Professional field 6.5. Forestry, scientific specialty „Technology, mechanization and automation of the woodworking and furniture industry from University of Forestry – Sofia, Faculty of Forest Industry

### 1. Brief biographical data for the candidate

Assoc. Prof. Dr. Stanimir Yordanov Stoilov was born on 03.02.1964 in town Elin Pelin. In 1983, he completed his secondary education at the Wilhelm Pick Technical School of Energy (now the Henry Ford Vocational High School of Motor Transport and Energy) in Sofia with a degree in „Heat and Refrigeration Engineering“.

After completing his military service, he entered in 1985 as a student at the Higher Forestry Technical Institute - HFTI (now University of Forestry – UF). He graduated in 1990 as a master's degree mechanical engineer in „Forestry Mechanization“, specialty „Complex mechanization and flow lines in forestry“. From 1990 to 1997 he worked as Head of the Mechanization Department at the State Forestry - Sofia.

After a competition, from 1997 to 2001 he was a full-time assistant professor at the Department of Forestry Technology and Mechanization (FTM), Faculty of Forestry (FF). From 2001 to 2005 he was Senior Assistant Professor and from 2005 to 2010 - Chief Assistant Professor. From 2010 to the present he has held the academic position of Associate Professor.

From 2002 to 2005 he was a PhD student in the scientific specialty „Machinery and equipment in the forestry, logging, woodworking and furniture industries“ (MEFLWFI) at the Department of Forestry Technology and Mechanization (FTM). In 2006, he defended his thesis on „Traction and coupling properties of wheeled tractors in logging“ and obtained his PhD.

Assoc. Prof. S. Stoilov was successively Deputy Dean of the Faculty of Forestry for Academic Activities - term 2016-2020 and Deputy Dean for Research - term 2020-2024. r.

The candidate gives lectures and exercises in the disciplines: „Forest Transport“, specialty „Forestry“ (F), Bachelor's degree, full-time and part-time study - lectures; „Operation of Forest Transport Equipment“, specialty „Forest management and forestry economics“, Master's degree, full-time and part-time study - lectures and exercises; „Technological projecting in Forestry“, specialisation „Forest management and forestry economics“, Master's degree, full-time and part-time study - lectures and exercises; „Repair and Maintenance of Machinery“, specialisation „Forest management and forestry economics“, Master's degree, part-time study - lectures and exercises; „Traction Machinery“, specialisation „Forest management and forestry economics“, Bachelor's degree, full-time and part-time study - lectures and exercises (dropped from the curriculum in 2021).

Assoc. Prof. Stoilov speaks English (level B2) and Russian (level C1).



The candidate has several specializations in the field of competition:

- specialization in tractor technology (2002) at the Technical University - Sofia;
- specialization in the use of modern multi-operational machines for work on mountainous terrain and utilization of woody biomass for energy production (2009) at the Department of Forest Utilisation and Mechanisation at the Faculty of Forestry, Technical University of Zvolen, Slovakia;
- specialisation at the Università Mediterranea di Reggio Calabria, Italy (2022);
- specialisation at the Technical University of Zvolen, Slovakia, funded by the project BG05M2OP001-2.016-0022 „Modernisation of higher education in sustainable use of natural resources in Bulgaria“ (NatuResEdu).

## **2. Correspondence of the submitted documents and materials of the applicant according to the Rules of the Development of academic staff at the University of Forestry.**

The candidate for the academic position „Professor“ in the professional field 6.5 Forestry, scientific specialty „Machinery and equipment in the forestry, logging, woodworking and furniture industries“ (MEFLWWFI) has submitted all the necessary documents required by Article 65a (4) of the Regulations for the Development of the Academic Staff of the Latvian Technical University and the Law on Academic Staff Development (LDASRB), including:

- European CV.
  - Advertisement in the Official Gazette No. 7/24.01.2025 for the competition.
  - Notarised copies of diplomas of higher education, of the degree of Doctor and of the academic post of Associate Professor.
  - Document of academic position held.
  - Medical certificate.
  - Certificate of criminal record.
  - Certificate of experience in the specialty.
  - Self-assessment report on the fulfilment of the minimum national requirements under Article 2a(2), (3) and (4) for the academic post of professor (on the UF template) and the additional requirements under Article 2a(5).
  - Habilitation reference.
  - Reference to the contributions in the candidate's theses which do not repeat the theses from the last competition for an academic position and from the last thesis defended.
  - List of publications, inventions, citations and other scientific and applied results.
  - Classification of publications.
  - Documents and written material certifying other professional and creative activities and performances within the meaning of Article 52.
  - Official notes on participation in scientific and educational projects.
  - Declaration of credibility.
  - Information card in Bulgarian and English.
  - Summaries in Bulgarian and English of the works submitted for the competition.
- All documents are uploaded electronically.

## **3. Assessment of the candidate's educational and pedagogical activities (work with students and PhD students)**

Assoc. Prof. Dr. Stanimir Stoilov has been working as a lecturer at the UF - Sofia for 28 years. After his habilitation in 2010 he is the holder of the following teaching disciplines:

- „Forest Transport“, specialty F, Bachelor's degree, full-time and part-time studies.
- „Operation of Forest Transport Equipment“, specialisation „Forest management and forestry economics“, Master's degree, full-time and part-time study.



- „Technological projecting in Forestry“, specialisation „Forest management and forestry economics“, Master's degree, full-time and part-time studies.
- „Repair and Maintenance of Machinery“, specialisation „Forest management and forestry economics“, Master's degree, full-time and part-time studies.

His average teaching load, for the last five years, amounts to 310 hours.

Assoc. Prof. Stoilov is the author and co-author of the curricula for the courses „Forest Transport“ (2021); „Operation of Forest Transport Equipment“ (2021); „Technological projecting in Forestry“ (2021) and „Repair and Maintenance of Equipment“ (2021).

The candidate has been a scientific supervisor of a total of 40 successfully defended graduates, of which 25 for the Master's degree.

Assoc. Prof. Stoilov is a scientific supervisor of one PhD student on independent training in the scientific specialty „Technology, mechanization and automation of forestry and timber harvesting“ (Forest transport), who defended and acquired the PhD on 03.01.2017.

Annually participates in a complex practice of students from the specialty of F.

He is a member of the Organizing Committee of the International Scientific Conference „Forestry - Bridge to the future“, held in Sofia in 2021.

Assoc. Stoilov is also a member of:

- the Editorial Board of the special issue „Decision Analysis and Optimal Strategies for Forest Operations and Management“ 2025 of the journal „Forests“;
- the Scientific Committee of the 4th International Conference „Wood - Science - Economy. Sustainable forestry and forest - opportunities and constraints under climate change“, held in 2022 in Sofia, Bulgaria. Poznan, Poland;
- Scientific Committee of the International Conference „100 years Forestry Education in Bulgaria CENFORKNOW 2025“, Sofia;
- Scientific Committee of the International Scientific Conference „Risk in biomass processing and use“, 2025, TU - Zvolen, Slovakia.

Assoc. Prof. Stoilov has also published supporting literature for training: University textbooks: „Traction Machinery“ (2017 - stand-alone), „Forest Transport“ (2017 - stand-alone); „Traction Machinery Exercise Manual“ (2020 - stand-alone); published book based on a defended dissertation thesis „Study of traction and coupling properties of wheeled tractors for logging“ (2024 - stand-alone).

There are 4 official notes and websites confirming the candidate's participation in various educational and scientific projects, committees and memberships in editorial boards and scientific committees.

#### **4. Assessment of candidate's scientific, scientific-applied and publishing activities** (General description of the presented materials)

Candidate Assoc. Prof. Stanimir Stoilov participated in the competition with:

- Habilitation thesis - 1 pc., including 10 scientific publications in publications, refereed and indexed in world-known databases with scientific information;
- Published book based on the defended dissertation for the award of PhD - 1 pc.;
- Study - 1 pc.;
- Textbooks - 2 pc.;
- Textbooks - 1 pc.;
- Publications - 22 pc.;
- Projects - 9 pc.

According to Web of Science Core Collection metrics, the Hirsch index of Assoc. Prof. Stoilov is H-index = 4.



#### 4.1 Participation in scientific, scientific-applied and educational projects

Assoc. Prof. Stoilov has submitted a report on participation in 9 projects, of which 5 research and 4 educational projects. In 3 of the research projects he is the team leader and in 2 he is a member of the working team. One of the research projects is bilateral (Bulgarian-Slovak), funded by the National Research Fund of the Republic of Slovenia. The other 4 - funded by the Research Sector - University of Forestry through a subsidy of the Ministry of Education and Science.

#### 4.2 Characterization of published scientific results

- ❖ In the habilitation report (habilitation thesis) submitted for the competition, with the title „Study of machines for close transport of wooden materials“, the results of experimental, theoretical and comparative studies on the techno-economic indicators of conventional and combined machines for close transport of wooden materials, as well as issues related to occupational safety in the operation of rope lines for close transport of wooden materials are included. Predictive models have been developed relating time consumption and productivity to relevant operational factors, including the degree of tree damage. The results of the research are useful for group-phased and compulsory logging in forests, protected areas, Natura 2000 sites, and for achieving economic and environmental efficiency of timber transport in broadleaved forests of sensitive areas. The type, proportion and timing of the most common accidents and the conditions that lead to increased occupational safety are also identified.
- ❖ One study has been submitted to the competition, which discusses the technology of Geographic Information Systems (GIS) and their application in forestry and transport development of forest areas. Using modern GIS technologies, the main indicators of the primary and secondary forest road network in three selected forest holdings were established. The results of the analysis of all the investigated terrain, economic and environmental factors influencing the choice of mechanized means of timber transportation in natural production conditions are used to justify the selection of the most appropriate means of transport.
- ❖ A book based on a defended dissertation for the award of PhD with the title „Study of the traction-clutching properties of colex tractors for logging“ was published. This book promotes the results of the author's dissertation of the same name, aimed at researching and improving the traction capabilities, traversability, efficiency and productivity of wheeled tractors for logging.

The publications can be classified as follows:

##### **By type:**

- Publications in scientific journals - 18 numbers (55%);
- Publications in proceedings of scientific - 14 numbers (24%);
- Study in a scientific journal - 1 number (1%).

##### **By significance**

- Articles in journals refereed and indexed in Web of Science (WoS) and SCOPUS with impact factor and impact rank - 12 pcs. (37%);
- Articles in proceedings of scientific forums refereed and indexed in WoS and SCOPUS - 3 pcs. (9%);
- Articles in peer-reviewed journals not refereed in WoS and SCOPUS - 8 pcs. (24%);
- Articles in proceedings of scientific forums and collective volumes - 9 pcs. (27%);
- Studies in peer-reviewed journals not refereed in WoS and SCOPUS - 1 pcs. (3%).

##### **Place of publication:**



- Articles in refereed in WoS and SCOPUS with impact factor or impact rank in foreign journals - 9 pcs. („Forest“ - 3 pcs.; „Forest systems“ - 1 pcs.; „Agricultural Engineering“ - 1 pcs.; „Sustainability – MDPI“ - 1 pcs. ; „Forest Engineering“ - 1 pc; „Small-scale Forestry“ - 1 pc; „Biosystems Engineering“ - 1 pc);
- Articles in WoS and SCOPUS refereed journals with impact factor or impact rank in Bulgarian journals - 3 pc. („Forest Ideas“ - 3 pcs.);
- Articles in proceedings of scientific forums abroad, refereed in WoS and SCOPUS - 3 pcs. („Chip and chipless woodworking processes“ - Slovakia - 2 pcs.; „Forest and Sustainable Development“ - Romania - 1 pcs. );
- Articles in Bulgarian peer-reviewed journals not refereed in WoS and SCOPUS - 8 pcs. („Innovations in Woodworking Industry and Engineering Design“ - 3; „Agricultural Engineering“ - 2 pcs. ; „Woodworking and Furniture Manufacturing“ - 2; „Management and Sustainable Development“ - 1);
- Articles in the proceedings of scientific forums in Bulgaria, not refereed in WoS and SCOPUS - 6 pcs. („Aviation, Automotive and Railway Engineering and Technology "BulTrans-2017“ - 3 pcs. ; „Innovations in Forest Industry and Engineering Design“ - 3);
- Articles in proceedings of scientific forums abroad, not refereed in WoS and SCOPUS - 2 pcs. („Wood Technology & Product Design“ - RN Macedonia - 1 pc.; „Military technologies and special technologies ICMT-IDEB 2010“ - 1 pc.);
- Articles published in collective Bulgarian volumes not refereed in WoS and SCOPUS - 1 („Mechanics, Transport, Communications“);
- Studies in peer-reviewed journals not refereed in WoS and SCOPUS - 1 („Forest Science“).

#### **Publishing language:**

- In Bulgarian - 10 numbers;
- In English - 23 numbers.

#### **Number of co-authors:**

- Stand alone - 3 numbers;
- With one co-author - 11 numbers;
- With three or more co-authors - 9 numbers.

The scientific results published by Assoc. Prof. Dr. Stanimir Stoilov and the data, which are presented in Annex 2 of NACID, form a total of 158.2 points for group B4 with minimum requirements of 100 points, and a total of 230.6 points for group G with minimum requirements of 200 points. This makes 88.8 points more than the minimum national requirements for the academic position of Professor in the professional field 6.5 Forestry.

*No plagiarism has been detected in the applicant's published materials for the competition.*

### **4.3 Reflection of Candidate's Scientific Publications in Literature (known citations)**

The documents submitted by Assoc. Prof. Stanimir Stoilov include a list of 82 known citations (excluding self-citations) of 22 of his works by other authors and copies of supporting material.

- Total - 82 citations.

#### **By type of citations:**

- In WoS and SCOPUS refereed journals and proceedings of scientific forums - 72 citations;
- In monographs and collective volumes with scientific review - 1 citation;
- In non-refereed peer-reviewed journals - 9 citations.



According to the report submitted by Assoc. Prof. Dr. Stanimir Stoilov, the total number of points for indicators D13, D14 and D15 is 1135 points with the requirement of 100 points for the academic position Professor in the professional field 6.5. Forestry.

*The scientific and applied activity of the candidate is well reflected abroad and in our country.*

#### **4.4 Contributions to the candidate's work** (scientific, scientific-applied, applied)

In the present review, 33 scientific papers are subject to evaluation for the candidate's contributions. The candidate's contributions in the following publications are not subject to evaluation due to my co-authorship in them: №№ G 7.2.; G7.3.; G8.5.; G8.6.; G8.7. It should be noted that the listed publications contain results in the field of the announced competition in „Forest Transport“, in which publications Assoc. Prof. Stanimir Stoilov has contributed to.

The candidate has united the scientific, scientific and applied contributions in the following three main areas:

- i. In the field of research of close transport machines for wooden materials.
- ii. Research on transport development of forest areas.
- iii. Research in the field of utilization of woody biomass for energy.

Assoc. Prof. Dr. Stanimir Stoilov has claimed, in the submitted works, a total of 52 (fifty-two) contributions, of which: 17 (seventeen) scientific contributions; 25 (twenty-five) scientific and applied contributions and 10 (ten) applied contributions.

After analyzing the scientific works of the candidate and the scientific, scientific-applied and applied contributions declared by him in the competition, the following can be accepted:

##### **❖ Scientific contributions:**

- i. It has been found theoretically and experimentally that for specialised 4×4 choker tractors with rigidly coupled front and rear axles and tyres of the same size, the weight distribution coefficient between the axles affects the skidding efficiency.
- ii. The mathematical solution of the navigation problem of delta rope systems by the methods of odometry is defined. The advantage of navigation by this method is simplicity and reliability, including independence from satellite navigation systems.
- iii. The publications under NoNo. G7.5, G8.13, G8.14 and G8.15 date from 2009, i.e. before the acquisition of the academic position of Associate Professor. In the competition materials, the candidate should have provided a reference to all publications, including those with which he participated in the competition for Associate Professor, which I report as an omission. Such a reference was, additionally, requested to establish that the above-mentioned publications were not included in the competition materials for the post of Associate Professor.
- iv. Translated with DeepL.com (free version)
- v. Predictive models were developed to estimate the productivity and cost of proximate transport, establishing the relationship with operational factors and the degree of tree damage. A general regression equation is derived for ropeway productivity, which depends only on the volume of course load, and at the corridor level is highest for predominant damage type 1D, followed by that with predominant damage type 1B, and lowest for type 1A.
- vi. Regression models are derived based on the studied indicators of mobile rope lines in the process of group-gradual logging in deciduous forests, falling within the protected areas of the European ecological network „Natura 2000“. They show that the duration of the duty cycle without downtime is affected by the draw distance to the carriage and



the slope of the terrain, and when downtime is included, by the removal distance and the slope of the terrain.

- vii. Based on regression analysis, variable factors that affect the duration of work cycle elements and productivity are identified. The COST model was used for cost analysis. The study contributes to add new data on the proper use of beech forests on a tractor-mounted rope line (Valentini V400) and a skidderless tractor (Timberjack 1010D).
- viii. Mathematical models are derived for the duration of the transport cycle in the close transport of timber materials, which reflect the influence of technological and technical parameters in the operation of the tractor, the tax parameters of the plantation and silvicultural parameters of the logging.
- ix. An analytical equation is proposed to determine the influence of design and operating factors in close transport on the fuel economy of specialized wheeled tractors hauling in the semi-loaded position.
- x. A methodology has been developed for experimental study of the performance of specialized wheeled tractors for close transport in a semi-loaded position, in real operating conditions, which allows to shorten the duration of the experiment by using modern measuring equipment for determining fuel consumption and for connection with the global information system.

❖ **Scientific and applied contributions:**

- i. The weight distribution coefficient between the axles was found to affect the skidding efficiency of the four-wheel drive specialised choker tractors. High efficiency values are achieved when the air pressure in the front and rear tyres is the same and low efficiency values are achieved when the air pressure in the front tyres is at the upper level and in the rear tyres at the lower level.
- ii. On the basis of experimental studies, the productivity of a unit consisting of a multi-operator machine (harvester) and a sorting tractor (forwarder) in clearcutting and regeneration harvesting was established, with an upper slope limit of 45 and 55% for the use of wheeled machines. The productivity of the multi-operator machine in regeneration harvesting is 10-15% higher than in clear felling. The close correlations between the net operating time of the multioperating machine and the average diameter at breast height of felled trees were confirmed. A low correlation was found between the time for primary processing of trees and the number of cuttings obtained.
- iii. It has been found that the ratio of front and rear wheel traction coefficients best represents the effects of weight distribution between them on traction and facilitates mathematical modelling of the process.
- iv. Experimentally, it has been shown that the greatest time cost of close transport by rope lines in abiotically disturbed forests is for uprooted whole trees (Type 1A failures) and is on average about 2 times longer than for hanging whole trees (Type 1B failures) and broken tree sections (Type 1D).
- v. It has been shown that with the help of modern GIS technologies, the main indicators of the terrain, primary and secondary forest road network in forest areas can be established, and with the additional inclusion of economic and environmental factors, a reasoned choice of mechanized means for close transport of wood can be made.
- vi. The calorific value and ash content of industrially and laboratory produced pellets of *Salix viminalis* L. have been experimentally investigated according to a developed methodology and found to be lower compared to industrially produced softwood pellets.



#### ❖ **Applied contributions:**

- i. The productivity and cost-effectiveness of close transport with a specialised 4×4 choker tractor in the removal of forced felling in plantations in protected areas of the European ecological network "Natura 2000" of common beech affected by wet snow damage of types 1A (uprooted whole trees) and 1D (broken sections of the tree) is established.
- ii. It has been shown that the length of the working cycle without stoppages of a specialised brushless tractor operating in a sequential transport system is influenced by the length of the transport distance and the number of stalks forming the course load, while the length of the transport distance and the volume of the course load determine the length of the working cycle with stoppages.
- iii. As a result of the studies and analyses carried out, it is recommended to use in Bulgaria processor rope lines, which are suitable for work in plantations located on high slopes and rugged terrain and with a high concentration of logging, including plantations affected by calamities, where it is necessary to quickly recover the wood and limit the adverse impact on the remaining trees after logging.
- iv. Based on the studies of the primary and secondary forest road network in the Central Rhodopes region, the average distances, average gradients, average coefficient of elongation, the deformation on the road surface of the forest transport lines have been determined and proposals for the improvement of the forest road network and the transport development of the forest exploitation basins in the Central Rhodopes have been made.

#### **5. Assessment of the applicant's personal candidate**

The documents, scientific papers and evidence submitted by the applicant are well structured and no significant gaps have been identified. The main part of the results achieved are his personal work, 3 (three) of the papers are independent, and in 15 (fifteen) of the collective works he is in the first place. In addition, Assoc. Prof. Stoilov has published 2 (two) independent textbooks, 1 (one) independent training manual, 1 (one) co-authored study and a book based on a defended dissertation. On this basis, I accept that the above-mentioned contributions to the competition for the academic position of Professor are the personal work of the candidate or have been achieved with his active participation.

#### **6. Critical remarks**

In the works of Assoc. Prof. S. Stoilov and the presented creative achievements, with which he participated in the competition, I have not found any significant shortcomings, such as wrong formulations and approaches, incorrect methods and generalizations or incomplete analysis of the obtained results.

I would like to share some critical remarks and recommendations to the candidate:

- i. The candidate's claims for fifty-two (52) scientific, scientific and applied contributions can be presented in a more concise and summarized form.
- ii. The publications numbered G7.2. and G7.3. are in the proceedings of an international scientific conference in the Slovak Republic with the title „*Chip and chipless woodworking processes*“, not „*Chip and chipless woodcutting*“, which I accept as a clerical error.
- iii. The citations for indicators D13 and D15 must be to the material with which the applicant is competing for indicators B4, G7, G8 and G9. In this respect, citations under D13.3 (2 citations), D13.4 (1 citation), D13.5 (25 citations), D13.6 (3 citations) and D15.2 (1 citation) that are not included in the group of B4, G7, G8 or G9 will not be accepted. The total number of known citations of 82 will be reduced to 50 and the cited



- works of 22 to 17. In this case, the applicant's score for indicator E will be 665, which exceeds the requirements for the academic post of Professor in the professional field 6.5 Forestry by 565 points, against the requirement of 100 points.
- iv. Of the 50 citations accepted, 38 of them have evidence that can be verified using a Digital Object Identification (DOI) system. For the remaining 12 citations, the applicant should have provided copies of supporting material, which I take to be an omission.
  - v. I recommend Assoc. Prof. Stoilov to continue his scientific research work, as well as to publish his independent and co-authored articles in journals with impact factor.
  - vi. I recommend Assoc. Prof. Stanimir Stoilov to continue to work actively and purposefully as a lecturer and scientist, passing on his experience to both students and PhD students under his supervision.

## **7. Personal impressions**

I know Assoc. Prof. Stanimir Stoilov as a colleague and lecturer, as well as from my personal impressions from our work together. Assoc. Stoilov has established himself as a good lecturer and scientist, working actively with students, proof of which are the graduates supervised by him and the doctoral student who defended under his supervision.

Assoc. Prof. Stoilov is actively involved in the administrative and managerial work of the Faculty, as Vice Dean in two consecutive terms, and also as a member of the Faculty Council of the Faculty of Forestry.

Assoc. Prof. Dr. Konstantin Marinov has successfully entered, as a good professional, in the scientific field of the competition.

## **8. Conclusion**

**In connection with the above, I propose that Assoc. Prof. Dr. Stanimir Yordanov Stoilov be elected „Professor“ in the discipline „Forestry transport“ in the Professional field 6.5 Forestry, scientific specialty „Machinery and equipment in the forestry, logging, woodworking and furniture industries“.**

Signature of the reviewer:

/Prof. Zhivko Gochev, Ph.D./

Review submitted to: 07.05.2025