

Technická univerzita v Košiciach, Letecká fakulta

HODNOTENIE HABILITAČNEJ PRÁCE

POSUDOK OPONENTA PRÁCE

Názov práce: **Skúšobníctvo a expertízna činnosť v oblasti padákovej techniky**

Autor: **Ing. Peter Kaľavský, PhD.**

Odbor habilitačného konania *doprava*

Akad. rok: **2021/2022**

a inauguračného konania:

Oponent: **Prof. dr hab.pil.inž. Jaroslav Kozuba,**

Pracovisko opONENTA: ***Faculty of Transport and Aviation Engineering***

KOMENTÁR OPONENTA HABILITAČNEJ PRÁCE

METÓDY SPRACOVANIA HABILITAČNEJ PRÁCE:

The work submitted for evaluation contains 300 pages, consists of an introduction, a methodological part, five chapters containing legal bases, theoretical content as well as research parts related to individual sub-areas of parachute engineering, with particular emphasis on the aspects of its practical application as well as tips for further research and conclusion. The Author, taking into account his extensive experience and knowledge in the field of practical application of parachute techniques, chose the methods and techniques of theoretical research (analysis, synthesis, inference, analytical and computational methods) and practical research (experiment, laboratory tests) important from the point of view of the studied sub-areas of parachute engineering, with particular emphasis on taking into account the achievement of the assumed research objectives. Taking into account the analysis of legal acts in the field of procedures, technical standards and rules related to the construction and use of the parachute technique, the Author indicated, among other things, the possibilities and limitations of its use - chapter 1. In the second chapter, he conducted theoretical analyzes in the field of aerodynamics and flight mechanics of the research object - the parachute. The third chapter is devoted to the methodologies applicable to the ground-based testing of the parachute technique. The next, fourth chapter is a description and practical application of the methodology related to the implementation of practical flight tests of parachute techniques - incl. in terms of rescue, the discharge of goods, equipment, etc. from the board of an aircraft. The last, fifth chapter of the dissertation is devoted to theoretical considerations and a description of practical innovative research related to the application of the parachute technique in aviation. The applied research methods and techniques allowed the Author to achieve reliable, justified research results constituting the basis for further conclusions, and ultimately to achieve the assumed research goals. To sum up, the Author wrote the work taking into account the methodology in force for this type of research.

DOSIAHNUTÉ VÝSLEDKY HABILITAČNEJ PRÁCE A NOVÉ POZNATKY:

The dissertation presented for evaluation is a comprehensive analysis of the state of knowledge and a report on research carried out in the sub-areas related to aviation engineering (Chapters 2-4). On the one hand, this document contains an extensive analysis of legal acts regulating activities in the field of preparation and implementation of aviation tasks with the use of parachute technology (Chapter 1). An additional attribute of the work is an interesting analysis of dependencies, rules and phenomena occurring in mechanics and aerodynamics, as a result of the use of parachute technologies in aviation activities. An interesting supplement to the whole, and from the point of view of new knowledge, is innovative research in the areas related to the use of parachute techniques (chapter 5). An additional attribute of the work is an interesting analysis of dependencies, rules and phenomena occurring in with the use of parachutes on board aircraft; indication of the use of modern technologies in the process of using parachute techniques - e.g. determination of parachute flight trajectory, flight parameters and analysis of an accident using modern visualization techniques; interesting supplement to the whole, and from the point of view of new knowledge, is innovative research in the areas related to the use of parachute techniques (Chapter 5). As a result of theoretical and practical research in areas related to parachute engineering, the obtained results allowed the Author to make a significant contribution to science, including: developing a number of definitions related to the preparation and use of the parachute technique in flight; development of new / improvement of the existing procedures related to the measurement of parachute flight parameters and trajectory; presentation of a wide spectrum of phenomena, laws and principles related to mechanics and aerodynamics in the context of a comprehensive description of the operational use of a parachute and an aircraft with a rescue parachute as a subject of research. The topics presented above are undoubtedly the Author's contribution to science, they are also a serious contribution which constitutes the basis for raising to a higher level the areas related to safety in the preparation and implementation of aviation operational tasks using the parachute technique. Such results include the procedure for the reconstruction of an accident involving a collision of two parachutists during a parachute flight based on eyewitness accounts, or the procedure for determining the reasons for the failure to open the spare parachute cover by automatic release.

PRÍNOS PRE ĎALŠÍ ROZVOJ VEDY A TECHNIKY (UMENIA):

Undoubtedly, the results of the research carried out by the Author are a significant contribution in theoretical and practical aspects supplementing the current state of knowledge, at the same time they are a kind of a bridge to the further development of science and technologies applicable in parachute engineering. Achieved results of theoretical research in the field of aviation law and the preparation and application of the parachute technique in operational activities (Chapters 1-4). The fundamental achievements that may be a significant contribution to the further development of science are undoubtedly the proposed methodological solutions, often constituting an innovative approach to solving research problems - methodologies relating to the research of parachute equipment on the ground and in the air, as well as the introduction of modern technological solutions - the use of modern devices and systems visualization in research related to the use of the parachute technique in the air. Also noteworthy are methodologies and technologies, including computer technologies used by the Author to investigate adverse air incidents (Chapter 5).

PRIPOMIENKY A POZNÁMKY K HABILITAČNEJ PRÁCI:

The content, layout, sequence of chapters and substantive content of the work submitted for evaluation do not raise any major reservations. The literature on the subject analyzed by the Author and the results of its analyzes used in the work also do not raise any objections that may have an impact on the final assessment of the dissertation. It is also worth emphasizing the great diligence of the Author with regard to the edition of the work and observance of the rules of the literature applicable to this type of studies. It should be emphasized that, apart from the above-mentioned Attributes, work in its form and substantive content can be a useful material in the process of educating specialists in aviation specialties and aviation safety. It should be emphasized that, apart from the above-mentioned Attributes, work in its form and substantive content can be a useful material in the process of educating specialists in aviation specialties and aviation safety. It should be emphasized that, apart from the above-mentioned Attributes, work in its form and substantive content can be a useful material in the process of educating specialists in aviation specialties and aviation safety.

The weaknesses of the study, which do not affect its final evaluation, include the fact that:

- approx. 30% of the literature on the subject consists of regulations and instructions, approx. 10% is foreign literature, and the remaining items are Slovak and Czech literature, with a significant share of the Author of the dissertation. Increasing the foreign position to approx. 50% could significantly enrich the content contained in the study;
- it is also worth noting that in the part containing the objectives of the work, the thesis, main goal, research problems, basic research methods and techniques used by the Author in the research were not distinguished

OTÁZKY K RIEŠENEJ PROBLEMATIKE:

1. What research methods and techniques did the Author use in the research described in the dissertation?
2. Whether, and if so, how important the research results presented in the dissertation may have for aviation safety
- please provide min. 4 examples?
3. How and to what extent does the Author intend to use the content of the dissertation as part of the study programs at the Faculty of Aeronautic at TUKE?

SPLNENIE SLEDOVANÝCH CIEĽOV HABILITAČNEJ PRÁCE:

At the beginning of the study, the Author of the dissertation defined three main goals (page 29).

First goal - it was achieved through the development and presentation in a comprehensive form of methodological procedures and expertise in the field of parachute technique (Chapters 3-5).

Second goal – it was achieved by developing methodological procedures for research and expert activities in the field of parachute technique, including the description of the parachute as an aerodynamic test of the scientific object (Chapters 2-5).

Third goal - Specialized content in the field of parachute technique was prepared in a transparent manner and is fully suitable for use in the form of teaching material. it is useful for specialist staff - experts and students of aviation, including those studying at the TUKE Aviation Faculty (Chapters 1-5).

CELKOVÉ ZHODNOTENIE HABILITAČNEJ PRÁCE A ZÁVER:

The habilitation dissertation submitted by Eng. Peter Kalvsky, PhD, fulfilled requirements of § 76, odst.6, Higher Education Law 131/2002.

I recommend the habilitation dissertation to be defended and, after the successful process, I recommend to the Habilitation Commission that Eng. Peter Kalvsky, PhD, should be awarded by the Scientific Council of the Faculty of Aeronautics, Technical University Kosice the title: docent (in abbreviation „doc.“).

Predloženú habilitačnú prácu na základe predchádzajúceho hodnotenia

ODPORÚČAM prijať k obhajobe

a po jej obhájení navrhujem udeliť vedecko-pedagogický titul "docent (doc.)"

Podpisom na tomto posudku zároveň súhlasím s licenčnými podmienkami obsiahnutými v licenčnej zmluve na použitie posudku záverečnej práce, ktorá je súčasťou tohto posudku.

Dátum: 08.11.2021

podpis autora posudku