

**STATEMENT  
over disertation**

**for acquiring educational and scientific degree "doctor"  
division 5.2 "Electrical engineering, Electronic and Automation" Scientific area 02.21.07  
"Automated systems for information processing and management"**

**Author: eng. Nikola Nikolaev Sabotinkov**

**Subject: Research and management of safety systems in underground transport**

**Educational institution : Bulgarian Academy of Science, Institute of information and communication technologies, „Embeded intelgent technologies“**

**Scientific jury member; prof. dts. Tihomir Borisov Takov**

**1. Accuracy of the disertation's problem**

The disertation resembles the author's scientific researches in the field of underground safety systems management for increasing air quality and passengers safety. More often different approaches for protection the environment are applied and more specifically in the urban underground transport. The main goal of the disertation is researching and optimisation of different innovative approaches for managin safety systems in the urban underground transport, for increasing air quality and passengers safety. For acheiving this goal the disertation observe six specific tasks. The problem is highly popular in international scientific scale and a prove for that is the constant growth of usage in such kind of mesures in the real practise, as well as the increasing number of articles and papers in the field. Disertation's tasks are relevant to the scientific researches on international level.

The actuality and the originality of the topic is backed by the statement above.

**2. Problem and literature understanding degree and author's interpretation over the material**

Resolving the tasks in the disertation require author's deep knowledge in the field of control and monitoring systems for environmental parameters for the air quality, as well as the safety systems for improving the underground air quality and paasenger's safety. Based on the disertation research I believe that the author has very good knowledge of this field and has compleated a very good work. The analysis over the problems is backed by a wide research over the tendences in the field. A overview over the contemporary publications in the field is made (50 reference sources). Based on the research and the analysis of the existing theoretical background, the disertation present scientifically-applied conclusions about the methods for designing and realisation of environmental control and safety systems. The overall disertation work is very good, the language of the overview is clear and contains specialized therns and discriptions.

**3. Congruence between the goal and tasks and the achieved scientifically-aplied results**

The task and the goals of the disertation are clear and understandable. The research methodology is based on a comparing literature overview and studying the principleas of systems for environmental parameters control in the underground transport. Based on theoretical and experimental researches, environmental control and protection systems are analysed and modeled. The main concept is analised and connected in detail to the current researches in the field. A systems for monitoring of small dust particle concentrations are designed and simulation-medeled that can be used for environmental protection in the underground rail-transport. The anaysis and evaluation methods are choosen corectly and the results shows good reserach tools usage. Based on the chosen research path in the disertation and the results help for coplete object-oriented system for monitoring and control of environmental parameters. The choosen methodology reffers to the desired goal and tasks.

**4. Scientific and scientifically-aplied contributions in the disertation**

The provided material in the dessertation, which serves as a ground point for the contributions have scientific and scientifically-aplied matter. The certainty of the results is proven by the 6 presentation in authorised journals and conferences in the country and abroad. The contributions are scientific and



scientifically-applied and can be associated to the new methods and means for construction research. They can be summarised as follows:

4.1. Scientifically-applied contributions for enriching the existing knowledge for design of systems for parameter monitoring and preserving the environment: the fine dust particle concentration in the underground is examined and the sources of pollution have been examined; a system for ventilation optimisation is optimised; innovative approaches for safety systems usage in the underground is developed.

4.2. Scientific contributions, containing new solutions for examining and application of methods and schemes for environmental parameters monitoring and control: modern methods for reducing the fine dust particle concentration are examined and analysed and improving the safety in the underground; new safety systems are applied for experimental results and simulations.

#### 5. Assessment of the publications within the dissertation paper

The main dissertation results are published in 6 publications as follows:

- 2 articles in reference journals( BAS publications);
- 1 report on foreign conference (Republika Hrvatska);
- 3 reports on international conferences in Bulgaria.

Three of the publications are authors.

In my opinion the main results have become popularised within the scientific auditorium in local and international level.

Author's research can be used in Sofia's metro, and a recommendation letter is sent to the management of "Metropolitan" EAD — Sofia for using the results without compensation.

#### 6. Notes, advices and comments

The dissertation is in modern field concerned with the systems for monitoring, preserving and managing the environment and is written clear with appropriate language, very well technically adapted. The author shows good theoretical and practical knowledge for analyse and research. The most influent scientifically-applied contributions are summarised as creating, developing and use of original systems for monitoring and protection of the environment. The overall appearance of the dissertation is for a weel developed research.

More literature sources could be examined.

## CONCLUSION

For acheiving educational degree "Doctor" the student gain deep knowledge in the field of systems for monitoring and protection of the environment.

For the scientific part, the student shows very good research abilities, that can be involved in his future profesional development. The number of scientific and scientifically-applied contributions and the quality of the publications are significant.

I think that the dissertation follows the rquirements of ЗРАСРБ. Taking in consideration the relevance of the dissertation, the deep research work and result's practical application, I suggest to the jury to award **mag. eng. Nikola Nikolaev Sabotinkov** with

educational and scientific degree "Doctor" in:

discipline 5: **Technical sciences**

division: **5.2. Electrical engineering, Electronic and Automation,**

scientific area: **Automated systems for information processing and management**

24.08.2019 год.

Signature:

**NOT FOR  
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/ prof. Dr.Sc. Tihomir Borisov Takov /