

PERSONAL OPINION**on a dissertation for a PhD degree**

Author of the dissertation: dipl. Eng. Gencho Dinev Georgiev, PhD student at the "Ocean Technologies" department of the IO-BAS Varna.

Subject of the dissertation: "FLOATING CAISSON OF TYPE PNEUMO STRUCTURE"

Author of the opinion: Prof. Eng. Yuriy Ivanov Dachev PhD, Naval Academy "Nikola Vaptsarov" - Varna

1. Relevance of the developed problem

The dissertation focuses on the problems related to the construction of hydrotechnical facilities for different purposes in the continental shelf. For this purpose, floating hydrotechnical structures are widely used in world practice. The PhD student emphasizes that efforts should be focused on the improvement of existing and the creation of new types of caissons, as well as the introduction of new methods of construction work for these that will reduce the expenditures, material costs and deadlines for construction of such facilities on the shelf.

2. Does the doctoral student know the state of the problem and does he evaluate in a creative way used information sources?

The doctoral student has a Master's degree in Hydraulic Engineering of Waterways and Ports, obtained at the Kuibyshev Civil Engineering Institute in Moscow. His professional career started as research associate at the IO-BAS Varna and later proceeded as Chief expert and Chief inspector at the Port Administration Executive Agency, which gave him the opportunity to gain sufficient knowledge and experience in the problem developed in the dissertation.

The literature used in the dissertation covers 67 sources. It includes textbooks, scientific publications and regulatory documents concerning the construction of hydraulic facilities and problems related to these.

The literature is correctly and appropriately selected and corresponds to the topic of the dissertation. It is suitable for substantiation of research methods for achieving scientific reliability and own scientific-applied and practical contributions.

The used literature was evaluated creatively, a good and thorough analysis was made in favor of the research on the topic of the dissertation, with correct references to the sources. As a result, well-founded conclusions are made and the purpose and tasks of the dissertation are precisely formulated.

In the first chapter a detailed analysis of the large-scale hydraulic structures used in the world practice is made, as well as their advantages and disadvantages are looked through. The chapter ends with a proposal for a new type of caisson with pneumatic support. The problem was solved by the doctoral student with an invention and a patent for a caisson that can withstand heavy loads in shallow and deep water areas.

The purpose and tasks of the dissertation are formulated in the second chapter.

The third chapter describes in detail the new construction of a caisson proposed by the doctoral student, which he names "a caisson of a new type of pneumatic construction". The doctoral student emphasizes that when implemented it will be one of the most economical and universal structures in hydraulic engineering. A methodology for determining the main elements of the caisson is applied. In the conclusions to the chapter, it is declared that the study of the buoyancy and stability of the new facility is a novelty.

The fourth chapter describes the results of the theoretical and seaworthy research of the proposed caisson of a new type of pneumatic construction.

At the end of the dissertation, conclusions and recommendations are made, supporting the practical implementation of the floating caisson type pneumatic construction.

3. Do the proposed methodologies give an answer to the set goals and objectives of the dissertation

I confirm that the methodology proposed and experimented by the doctoral student for conducting the theoretical and seaworthy research of the proposed floating caisson type pneumatic construction accurately and reasonably provide answers to the set goals and objectives.

4. Contributions of the dissertation

I accept that the results achieved in the dissertation are the work of the doctoral student himself. Based on the results obtained in the dissertation, the following scientific-applied and practical contributions are formed:

Scientific applied contributions:

1. A caisson of a new type is proposed - a floating pneumatic construction, which is a novelty in the hydraulic engineering construction and without analogue in the world practice. The construction is applicable in hydraulic engineering for the construction of gravitational facilities subjected to high loads in aquatic environment on any type of ground in shallow and deep water areas.

Practical contributions:

1. A method has been developed for placing a caisson pneumatic structure with the help of back pressure / vacuum /.

2. The operating parameters of a floating caisson type pneumatic construction have been validated in order to establish some basic hydrodynamic specifications (stability, resistance, seaworthiness, etc.), necessary for transportation to the place of its installation in certain hydrotechnical facility.

3. Recommendations are formulated for ensuring the structural characteristics of a caisson pneumatic structure at a certain configuration of its parameters in terms of static stability and the required power applied during its towing.

4. Recommendations have been formulated for ensuring the structural characteristics of the pneumatic caisson structure and requirements have been set for the insulation and airtightness of the reinforced concrete, in accordance with the variable external temperature and the impact of the aggressive sea water.

5. Application of the results of the dissertation work in practice

Evidences for the application of the results of the dissertation in practice are:

1. Invention for a new type of caisson - floating pneumatic construction, with copyright certificate № 44643 / 08.07.1985, patented in Bulgaria with patent № 1147, in the Netherlands with patent № 8 701 423, in France with patent № 2 616 464 , in Finland with patent № 890047, in Singapore (China) with patent № 89100199.9 and in Russia with patent № 7774529/03).

2. Invention with copyright certificate № 91624, 1990 for a method for placing of a caisson - floating pneumatic structure with back pressure (vacuum).

6. Notes and recommendations

I believe that it is necessary on the basis of the accumulated experience, the research and the results obtained in the dissertation to prepare a monography on the use and development of caissons in hydraulic engineering.

7. Resume

The resume of the dissertation is in 35 pages. It meets the requirements and very well reflects the content of the dissertation.

CONCLUSION

The dissertation "FLOATING CAISSON TYPE PNEUMO-STRUCTURE" is completed scientific work with achieved scientific-applied and practical contributions. The doctoral student has the necessary qualities to be awarded the educational and scientific degree "DOCTOR" in accordance with the requirements of the Law on the Development of the academic staff in the Republic of Bulgaria and the Regulations for its application.

I propose to the esteemed scientific jury to award Eng. Gencho Dinev Georgiev educational and scientific degree "DOCTOR" in the doctoral program "Doctoral program in professional / field 4.4. Earth Sciences."

02 July 2020
Varna

Prepared by
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