



**Международная научно-практическая конференция
«Физико-технические проблемы в науке, промышленности и медицине»
Секция 6. Актуальные вопросы ядерного нераспространения, безопасность и
экология ядерной отрасли**

**THE NEUTRONIC CALCULATION AND OPTIMIZATION OF SCHEMES OF STORAGE SPENT
NUCLEAR FUEL**

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Today the improving of efficiency of nuclear power is the result of the decision of two basic problems. The first one, it is recovery of uranium from spent nuclear fuel and return it to the nuclear fuel cycle. The second problem is the increase of burnup of usual fuel and new types of fuel compositions such as (Pu, Th)O₂, (U, Pu)O₂, UC / (U, Pu)C, UN / (U, Pu)N [1-3]. The solution of these problems, in turn, leads to an increase in the volume of spent nuclear fuel, the complexity of ecological conditions, nuclear and radiation hazards of existing reactors and reactor facilities of the new generation. Nowadays in Russia there is one vexed problem, it is storage of spent nuclear fuel (SNF) of uranium-graphite reactors and others reactor facilities whose fuel is not reprocessed and stored in the intermediate-storage pools in Nuclear Power Plant [1].

In this work, the conceptual approaches and features of exploitation of technical systems of «dry» storage of spent ceramic nuclear fuel after thermal reactors are considered. The results of numerical studies aimed at determining the neutron-physical and radiation characteristics of spent ceramic nuclear fuel. The studies will allow to develop technical and regulatory solutions when handling perspective spent fuel of new generation reactor facilities. [1-3]. On the basis of numerical studies it's possible to create the safe circuits of layout and permutations of spent nuclear fuel in systems of conservation and transportation, if it is necessary, to develop technological regulations of removal from service of these systems including the possible dismantling and disposal of individual nodes. The study was supported by grants of the President of the Council of the Russian Federation. Competition for the scholarship of the President of the Russian Federation for young scientists and graduate students. Grant number SP-295.2015.2.

REFERENCES

1. Stroganov A.A., Kyriyudin A.V., Anikin A.Y. Analysis of the compliance of the Russian and international regulatory framework for the regulation of safety during transportation of radioactive materials and spent nuclear fuel // Nuclear and Radiation Safety. – 2011. – № 3. – P. 23–25.
2. Shamanin I.V., Bulanenko V.I., Bedenko S.V. The field of neutron radiation of ceramic SNF of different types // News of high school. The nuclear power engineering. – 2010. – № 2. – P. 97–103.
3. Bedenko S.V., Gnetkov F.V., Kadochnikov S.D. The dose characteristics of neutron fields of ceramic nuclear fuels of different types // News of high school. The nuclear engineering. – 2010. – № 1. – P. 6–12.
4. Bedenko S.V., Plevaka M.N., Knyshev V.V., Savasichev K.A. The study of neutron-physical characteristics of perspective ceramic spent nuclear fuel and optimization schemes it's storage // Abstracts of the V International School-Conference of Young Nuclear Workers of Siberia. – 2014. – P. 78.

**CREATION OF AUTOMATED TRAINING SYSTEM OF CONTROL AND ACCOUNTING OF NUCLEAR
MATERIALS**

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In the world, considerable efforts are made to ensure safe handling with nuclear materials (NM). Besides, safe handling is aimed at ensuring safety and continuity of knowledge on nuclear material. This implies three main