ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

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Basic Information:

Course Title: Nuclear Safety
Lecturer: Assoc. Prof. Dr. Mladen Mitev
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Total Teaching Hours: 30 hours

Annotation

The technological processes in the nuclear energy reactors are accompanied by a certain degree of risk, caused mainly by the possibility of uncontrolled development of the neutron-physical and thermal-hydraulic processes. Such processes may result in nuclear accidents with subsequent radioactive contamination of the environment. The main aim of this course is to provide the students with knowledge and skills for quantitative assessment of nuclear safety, formulation and solving of specific problems on reliability and nuclear safety. At the end of the course, as a demonstration, specific tasks from the fields of the doctoral students enrolled in the course will be examined.

Course content

Topic 1: Introduction to Nuclear Safety
Topic 2: Fundamentals of Nuclear Safety
Topic 3: Safety Functions
Topic 4: Concept of Defense in Depth
Topic 5: Reliability in Nuclear Power
Topic 6: Nuclear Safety in NPP Design
Topic 7: Nuclear Safety in NPP Site Selection
Topic 8: Nuclear Safety in NPP Commissioning, Operation and Decommissioning

Teaching and assessment methods

The teaching will be performed by lecturing.
The final grade will be formed by a passed exam in test form

Competencies acquired as a result of training

Nuclear risk evaluation
Nuclear equipment reliability evaluation
NPP lifecycle evaluation

Literature:

1. Наредба за осигуряване безопасността на ядрените централи, приета с ПМС № 245 от 21.09.2016 г.

2.IAEA Safety Standards, № SF-1, “Fundamental Safety Principles”, IAEA, Vienna, 2006;
3.“Сборник от нормативни актове по безопасно използване на ядрената енергия”, Том I и Том II, Първо издание, 2005 г. София;
4. “Basic Safety Principles for Nuclear Power Plants”, 75-INSAG-3 Rev. 1, INSAG-12, IAEA, Vienna, 1999;
5. “Безопасность Атомных Электростанции: Проектирование”, No SSR-2/1 (Rev1), Венна, Австрия, 2016;
6. “Безопасность Атомных Электростанции: Эксплуатация”, No SSR-2/2 (Rev.1) Венна, Австрия, 2017;
7. E. J Henley, H. Kumamoto, “Reliability engineering and risk assessment”, Prentice-Hall Inc. 1987; 8. “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant Specific Changes to the Licensing Basis”, U.S.NRC Regulatory Guide 1.174, Revision 1, November 2002;
9. Other IAEA safety publications, www.iaea.org