Hands-on experience with reactor operation

Czech Technical University in Prague, Experiment CTU10

Main topic: Reactor operation

Keywords: VR-1 reactor, reactor operation, hands-on experience

Purpose: Real operation of any nuclear reactor is a very complex task. The operator should take into account capabilities of its reactor technology and the adjoined reactor and experiment instrumentation and "pure reactor physics". The operator also should take into account strict requirements imposed by the national nuclear legislation. Hands-on experience reactor with operation gives chance to all students to get real personal experience with operating a real nuclear reactor.

Level of exercise:	☒ Basic	☐ Advanced	☐ Complex
Level of education:	☒ BSc	☒ MSc	☒ PhD

What you will learn:

Learning objective of the experiment is to obtain a practical experience with a behaviour of a real reactor. The experiment is highly suitable for students studying nuclear engineering as the major curriculum and it is suitable for students studying various major engineering curricula as such as power engineering, mechanical engineering, electrical engineering with future assignment in various nuclear curricula.

Important information:

- Minimal size of student group: 4
- Maximal size of student group: 10
- Overall duration of the experiment (in wall clock hours): 3

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Possibility to perform experiment on demand:	☒ Yes ☐ No
Frequency of occurrence:	On demand, ca 30 times/year
Examination modalities:	Protocol, evaluation, discussion
Teaching languages:	English, Czech

Pre-knowledge required: This is usually the last experiment of the educational course carried out at the VR-1 reactor. Prior to this experiment CTU02, CTU06, CTU08, CTU09 experiments should be completed and and it is recommended to carry out CTU01, CTU03, CTU04 experiments.

Instruments required for exercise:

- The VR-1 reactor

Execution:

Hands-on experience with reactor operation at the VR-1 reactor gives chance to students to run a real nuclear reactor under the supervision of a lecturer and a reactor operator. The students start with reactor check-in procedure before the operation starts. Then students withdraw control rods in order to put the reactor to a subcritical, critical and/or supercritical state to obtain a practical experience with the real reactor behaviour and to observe the mutual combination of all reactor physics phenomena which they have studied at the VR-1 reactor.

Limitations:

No particular limitation for this experiment, only general requirements for entry to research nuclear installation according to the Czech nuclear legislation should be fulfilled.