# Reactor operation exercise

## BME Training Reactor, Exercise BME-07

**Main topic:** Reactor Physics / Nuclear reactor operation

**Keywords:** reactor operation, safety of reactors

**Purpose:** This exercise is aimed at making the students familiar with the structure, operation, nuclear and technological measuring systems and control systems of nuclear reactors. In order to achieve these goals, students first study the characteristics of the control and safety systems and familiarize with the various nuclear and technological measurements. This is followed by the second part of the exercise when the students actually operate the reactor and study the behavior of the reactor and the control and safety systems in reality.



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

## What you will learn:

Students learn how a nuclear reactor is controlled and operated. They also learn how the safety systems intervene in case an error (either human or electronic) occurs. They also obtain information on the systems measuring the technological parameters and their role in the safe operation of the reactor.

## Important information:

- Minimal size of student group: 2
- Maximal size of student group: 6
- Overall duration of the experiment (in wall clock hours): 4
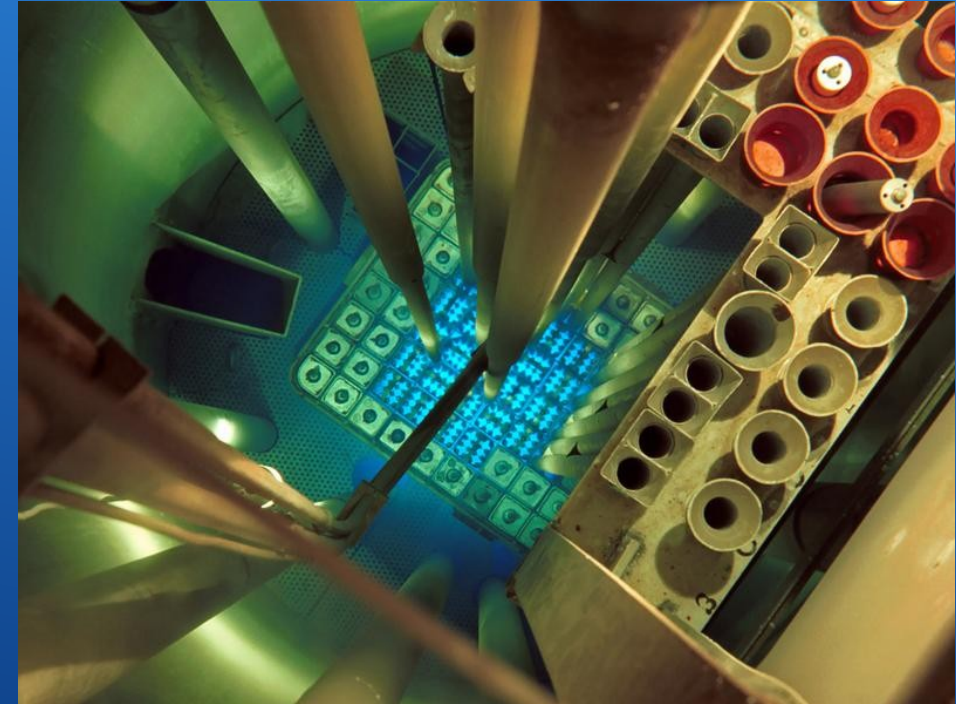
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Possibility to perform experiment on demand: ☒ Yes ☐ No

Frequency of occurrence: 10-12 times per year

Examination modalities: short test before measurement, experiment report after

Teaching languages: English, Hungarian

Pre-knowledge required: Fundamentals of reactor physics

Instruments required for exercise:
- Reactor instrumentation
- Control room instrumentation

Execution:
- Overview of the structure of the training reactor, measuring and control systems, fuel elements
- A visit to the technology
- Getting to know the electronic devices, meters and controls of the control room
- Starting of the reactor: making it critical and supercritical
- Changing power, analyzing reactivity feedbacks
- Studying the behaviour of period and level protection
- Shutting down the reactor

Limitations:
None