



# Reactor operation

## TU Wien, Exercise TUW-08



Main topic: Reactor Physics

Keywords: Reactor operation, TRIGA, I&C, control rods

**Purpose:** During this experiment the participants will gain first-hand reactor operation experience as well as detail knowledge of the TRIGA Mark II reactor (working principle, unique properties, principle of operation). Furthermore the participants are allowed to operate the reactor with the supervision of the reactor operator.

Level of exercise:  Basic  Advanced  Complex

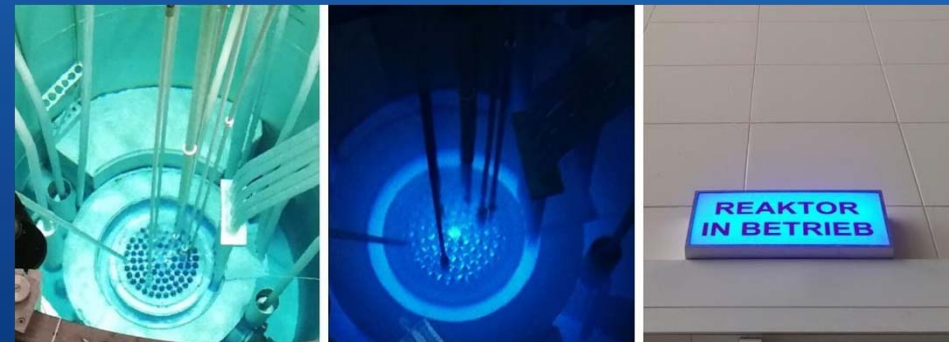
Level of education:  BSc  MSc  PhD

### What you will learn:

The participants will learn the effect of control rods and their connection to reactivity

### Important information:

- Minimal size of student group: 4
- Maximal size of student group: 8
- 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: Once a year

Examination modalities: Participation in the experiment, protocol and final written test

Teaching languages: English/German

**Pre-knowledge required:** understanding in nuclear and reactor physics: (nuclear fission, types of decay, cross section, nuclear reactions, multiplication factor, void coefficient of reactivity, criticality, neutron flux density and its behaviour); radiation physics and protection (radioactive decay, dose rate and limits, activity, and all aspects regarding radiation protection).

**Instruments required for exercise:**

- Reactor I&C system.

**Execution:**

- The participants will first hear a lecture about the TRIGA reactor Vienna. After that they will go to the reactor control room.
- The participants will then fully withdraw the transient rod.
- The reactor will still stay sub-critical since the other two control rods have a high enough reactivity value.
- After that the safety rod will be partially withdrawn.
- Then the regulating rod will be slowly withdrawn until the desired reactor power is reached.

**Limitations:**

This experiment will be conducted in a controlled radiation area. Hence, controlled radiation area limitations apply.

