

Forty Years of the TRIGA Reactor at J. Stefan Institute

By M. Ravnik

The TRIGA research reactor at the Reactor Centre of the Jožef Stefan Institute is celebrating its 40th anniversary, having started operations on 31 May 1966. The reactor has enjoyed 40 years of continuous operation with no failures of major components or any events violating safety standards. It was built by General Atomics (an American company), like more than 40 similar reactors around the world. In 1991 it was rebuilt and equipped for pulse operations. The technical condition of the reactor will allow it to operate for a further ten years, and it is planned to keep it operational at least until 2016.



To mark the anniversary we have set up a permanent exhibition on the 40 years of operation of the TRIGA reactor.

The TRIGA Mark II reactor is designed for training in reactor operation and technology, neutron research and isotope production. It is designed to be inherently safe, i.e. no operator error can damage the fuel or result in the release of radioactive material. If the reactor's power increases above the prescribed limit, the chain reaction will be shut down automatically due to the special properties of the fuel. In addition to its inherent safety, the

cornerstone of the reactor's security is the qualified, experienced and dedicated staff.

The reactor generates approximately 50 litres of low and intermediate radioactive waste per year. At present, no highly radioactive waste is stored at the reactor, as all spent fuel elements accumulated during operation since 1966 were shipped to the USA for final disposal in 1999.

The practical results of forty years of reactor utilization are as follows:

Training

- practically all nuclear professionals in Slovenia have attended practical training courses at the reactor (including all professors of nuclear engineering and reactor physics at the universities of Ljubljana and Maribor, as well as directors and key personnel of NPP Krsko, the Slovenian Nuclear Safety Administration and the Agency for Radwaste Management);
- all NPP Krsko reactor operators and other technical staff are trained on the TRIGA reactor;
- the reactor is used in regular laboratory work by graduate and post-graduate students in physics and nuclear engineering from the Faculty of Mathematics and Physics at the University of Ljubljana;
- on-the-job training for IAEA

Guests at the anniversary celebration were greeted by the Minister of Higher Education, Science and Technology, Dr Jure Zupan and the Minister of the Environment and Spatial Planning, Mr Janez Podobnik.





A round table discussion on the topic Use of the TRIGA reactor and the future of nuclear energy in Slovenia was led by Dr Matjaž Ravnik, director of the Reactor Infrastructure Centre at the Jožef Stefan Institute.

trainees from developing counties (an average of two per year) is important for the promotion of the Jožef Stefan Institute and Slovenian science;

- the reactor has been used for several international training courses;
- it is open to visitors (over five

hundred per year, mainly school children, come to see the reactor);

Research

- the reactor has been used in research work published in some 300 scientific papers and more than 600 published conference



Dr Matjaž Ravnik demonstrated the operation of the reactor to the two ministers and the Institute's director Dr Jadran Lenarčič.

reports;

- more than 20 PhD degrees, more than 30 MSc degrees and more than 100 first degrees have involved the use of the reactor.

Isotope production

- over 50,000 patients have been treated with radioisotopes produced in the reactor (mainly with radioactive technetium);
- 10-20 industrial sealed sources per year (mainly cobalt), totalling several hundred;
- several special radioactive sources (e.g. radioactive sodium in soluble compounds for turbine testing at Krško NPP).

Staff showed guests the reactor and the laboratories of the Department of Environmental Sciences.

The TRIGA reactor has played an important role in developing nuclear technology and safety in Slovenia. For forty years it has been a centre of modern technology. Its international co-operation and reputation are

