

Background

The BR2 is still **SCK·CEN**'s most important nuclear facility. After an extensive refurbishment of 22 months to compensate for the ageing of the installations, to enhance the reliability of operation and to comply with modern safety standards, it was restarted in April 1997. The facility is mainly used for the irradiation and testing of fuels and materials and for commercial productions – including radioisotopes for the medical and industrial uses, and NTD-Silicon.

Objectives

To keep the reactor facility available for the scientific irradiation programmes and commercial productions along the whole predefined operation schedule, while maintaining safety during operation as the top priority.

Principal results

The reactor was operated for 113 days at the mean power level of 56 MWth. The normal operation period was extended for a week during the summer to optimise the production of radioisotopes for the radiopharmaceutical industry.

The reactor was operated with an availability of 96.65 % (time at power over scheduled time at power). One interruption of operation was recorded due to a control rod drive mechanism and caused a delay of two days in the operation schedule. Another two days interruption of the operation was due to a malfunction on the feed-bleed control system of the CALLISTO loop.



General view on the process control room

Plant Operation Data	
Year	Availability %
1998	99,94
1999	99,97
2000	93,05
2001	96,15
2002	100,00
2003	97,81
2004	94,78

Plant operation data

Routine maintenance activities and inspections during the scheduled shutdowns guarantee the continued safe and reliable operation of the facility and provide the basis for a secure long-term future. Recurrent problems on control rod drive mechanisms are now being fixed by systematic control and replacement of critical components. New control rod drive mechanisms should be put into service from 2006 on.

The evacuation of fuel elements to Cogema-La Hague continued with one transport of 68 fuel elements. In total, from 1998, we had 17 transports for 1054 fuel elements.

After a successful qualification program launched in 2003, an order was placed with CERCA for the fabrication and delivery of a first full batch of high density fuel elements with a reduced (73%) enrichment

In collaboration with the SCK•CEN's Physical Control, we proposed and obtained the approval of our Licensing Authority for a detailed action plan in the frame of the 2006 decennial safety re-evaluation: the main objective is to guarantee the operational safety and the reliability of the facility until at least 2016.

Future developments

For 2005, we foresee:

- a standard operation schedule with an extra week of operation for the cycles 02 and 03/2005;
- various maintenance activities aiming at maintaining a secure and reliable operation;
- one transport of spent fuel elements to Cogema-La Hague;
- to start various activities (studies, inspections, maintenance...) as foreseen in our action plan in the frame of the 2006 decennial safety re-evaluation.

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Main reference

E. Koonen, F. Joppen, P. Gubel, "Safety challenges encountered during the operating life of the almost 40 years old research reactor BR2", IAEA-CN-82: International Conference on Topical Issues in Nuclear Safety, 3-6 September 2001, Vienna, Austria.