Area monitoring and radiation dose in the IEA-R1 reactor building

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Body of Abstract:

AREA MONITORING AND RADIATION DOSE IN THE IEA-R1 REACTOR BUILDING

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ABSTRATS

IEA-R1, is the oldest research reactor in the southern hemisphere. Located at IPEN, in the campus of São Paulo University, in São Paulo city, Brazil, it started to be built in 1956, and reached criticality for the first time on September 16th of 1957. It is a 5 MW pool type reactor, with MTR fuel elements, and is mainly used for research and radioisotope production, for nuclear medicine. The reactor is operated in a cycle of 60 continuous hours per week (2,0 MW nominal Power), and during the operation of the reactor, several measurements are made as part of a radiation monitoring program. The objective of this program is to perform a routine evaluation of the radiation dose in several pre-defined places, in order to assure the safety of the working conditions within the installation, as established on chapter 12 of the reactor´s Safety Analysis Report. The measurements are made using fixed radiation area monitors and portable radiation meters. The installation has a total of 9 fixed area monitors and 5 air monitors, being 4 installed in the air conditioning system, and one specific for noble gases. The portable radiation meters are used to measure radiation doses at 20 pre-defined places, being 5 around the reactor pool, and 15 in the experimental room. The results of the routine measurements are also used to evaluate the individual dose according to a model, which takes into account the activities of each worker during reactor maintenance and operation. The individual dose estimated in this manner, can be compared to the dose obtained by individual thermo-luminescence dosimetry. This paper shows that the correct application of the radiation monitoring program is the basis to maintain radiation doses as low as reasonable achievable (ALARA), for all working conditions of the reactor.