NEUTRON DOSIMETRY FOR TRANSPORT CASKS FOR SPENT NUCLEAR FUEL

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Abstract

Radiation from neutrons in transport casks for spent fuel has earlier been neglected during the handling of the casks upon arrival at the Central interim storage facility for spent nuclear fuel (CLAB, Sweden). Since the spent fuel nowadays is normally kept in the pool at the NPP for periods around one year but not longer than two years, the radiation contribution from neutrons has increased.
The effective dose from gamma and neutrons were determined for the handling of transport casks of spent nuclear fuel at CLAB during one year. The groups investigated were Health Physics and handling personnel, in all 14 workers.
The collective dose for one year from external neutron and gamma radiation was 5.403 mmanSv respectively 2.968 mmanSv. It is clearly so that the neutron dose contribution to the effective dose is to be considered in the mapping of the dosimetry of the transport casks. In general, both the neutron and gamma dose equivalent rates $H^*(10_{n,\gamma})$, increase with increasing decay power but transport casks with spent PWR fuel have a higher neutron dose rate than BWR fuel in relation to decay power and a higher neutron dose rate in relation to gamma dose rate.