PERSONAL DOSIMETRY SERVICE OF VF, A.S. COMPANY

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VF, a.s.

The VF, a.s. Company will extend its services in the area of personal dosimetry at the end of 2008, which is fully in compliance with the requirements of the Atomic Act, section 9 paragraph (1) letter r) and Decree on Radiation Protection, section 59 paragraph (1) letter a). Optically stimulated luminescence was selected in VF. a.s. as the most advantageous and the most advanced technology for the integral personal dosimetry.

Optically stimulated luminescence (OSL) has been using in dosimetry for more than ten years. Although it is relatively new technology, its indisputable advantages predetermine that technology has significantly benefited in personal dosimetry services within a short time all over the advanced world.

The VF, a.s. personal dosimetry service is based on the licensed products of LANDAUER, the US company, which is the world leader in OSL dosimetry. Crystalline Al_2O_3:C was selected as the detection material.

All equipment of personal dosimetry service is installed in the VF Centre of Technology in Černá Hora. The personal dosimetry service is incorporated in the International LANDAUER Dosimetry Service Network, and in the European Union, it is directly linked to the LANDAUER European Headquarters with its office in Paris. As a part of the OSL technology licence, the VF personal dosimetry service was included in the inter-laboratory comparison programme of the LANDAUER syndicate.

In the introduction of the presentation, the physical principle of optically stimulated luminescence is briefly described which is very similar to the well-known principle of thermoluminescence dosimetry (TLD). The basic difference is in the method of dosimeter stimulation, i.e. OSL uses a light source whereas TLD stimulation requires the dosimeter annealing. The great advantage of OSL is that there is no loss of information about the dose exposed during stimulation (evaluation), and additionally, the detector can be repeatedly used.

In the next part of the presentation, the dosimetric properties of personal OSL dosimeters based on Al_2O_3:C are described in detail. Their dosimetric properties are fully comparable with those of both film badge dosimetry still used as personal dosimeters in the Czech Republic and thermoluminescent dosimeters (TLD) used as personal dosimeters in Slovakia. In many cases (i.e. range of doses, possible fast and repeatable processing, environmental resistance, etc.), OSL dosimeter parameters are better than those mentioned above.

In the third part of the presentation, technical equipment and the OSL dosimeter evaluation process used in the VF personal dosimetry service are described. The technical equipment is based on the following facilities: the fully automatic Panasonic OSL reader with its capacity of about 200 dosimeters/hr and the LANDAUER annealing system with its capacity of about 120 dosimeters/hr. Because VF, a.s. has available the metrological ionizing radiation laboratory with a gamma irradiator in its Centre of Technology, it is possible to perform very flexibly all calibrations and checks of the evaluation system.

The organizational scheme of the VF, a.s. personal dosimetry service (in relation to the customers and the regulatory bodies) is described in the final part the presentation. The personal dosimetry service is based on the SOD database (personal dosimetry system) which was designed based on the VF long-time experience from the comprehensive development and maintenance of ISOD system (Information Personal Dosimetry System) used since the middle of the 1990s as the comprehensive database system for personal dosimetry in nuclear power plants in the Czech Republic.

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