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ISO/TC 85/SC 2

Secretariat: AFNOR

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Radiological protection — Procedures for monitoring the dose to the lens of the eye, the skin and the extremities

Radioprotection — Procédures pour la surveillance des doses au cristallin, à la peau et aux extrémités

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Foreword

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This document was prepared by Technical Committee ISO/TC 85, Nuclear energy, nuclear technologies, and radiological protection, Subcommittee SC 2, Radiological protection.

This third edition cancels and replaces the second edition (ISO 15382:2015), which has been technically revised.

The main changes are as follows:

— addition of neutron radiation;

— reference to up-to-date standards on reference radiation fields;

— clarification and extension of several procedures;

— extension of dosimetry procedures at nuclear power plants including indirect eye lens dosimetry.

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Introduction

The human body shall be protected from harmful effects of exposure to ionizing radiation, internally and externally. Effective dose limits keep the occurrence of stochastic effects to an "acceptable" level, while protection from tissue reactions (i.e. deterministic effects) is provided by dose limits for specific organs. The human skin shall be protected from external tissue reactions, such as erythema and ulceration. For the lens of the eye, there is the risk of radiation induced cataract at elevated exposures. To protect the skin of the whole body, the extremities, and the lens of the eye, separate dose limits are recommended by the International Commission on Radiological Protection (ICRP). These separate dose limits are needed because, in case of localized exposures, the equivalent doses to the skin and the lens of the eye could exceed these limits even if the effective doses were lower than the limit. Specific dosimetry is needed to monitor these doses and to assess compliance with applicable limits.

There are some situations where the correct assessment of the exposure of the skin, extremities, and lens of the eye can be challenging. In the nuclear sector, there can be exposure due to weakly penetrating radiation caused by unshielded unsealed radioactive sources, or by working in glove boxes. These types of exposure can occur, in particular in connection with contamination. Exposure to weakly penetrating radiation from radioactive noble gases in room air also shall be considered. In the medical field, doses to extremities and doses to the lens of the eye could occur during interventional procedures and in nuclear medicine.

Monitoring the extremities and the lens of the eye is not always straightforward, and many practical problems can arise for the application of monitoring in the workplace, due to issues such as geometry, resulting in an unsuitable monitoring situation. This document provides guidance on how and when this monitoring should be done, for all the different types of workplace fields. This document is directed to all who are involved in the dosimetry of the skin, extremities, and the lens of the eye; for example: radiation protection officers, regulators, workers, dosimetry services, etc.

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