

## **IS THE CURRENT SYSTEM OF THE QUANTIFICATION OF RADIATION EXPOSURE AND ITS MONITORING OPTIMAL?**

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During the various applications of ionizing radiation and nuclear technologies, workers, patients and members of the general public are always exposed to a certain amount of radiation. The well-known main objectives of radiation protection consist of minimizing stochastic biological effects and avoiding as much as possible deterministic effects. To achieve an adequate level of protection of individuals, it is necessary to keep the exposure as low as possible below the upper acceptable levels expressed in terms of relevant dose limits. For this purpose the exposure has to be assessed by means of appropriate quantities and measured or monitored using adequate units. In order to estimate any harmful health impact caused by radiation exposure, many specific quantities have been introduced. A great number of these quantities adopted throughout the last 50 years or so as well as several different units, some of which can be attributed to more than one quantity, have led to confusions not only among the public but also among professionals who are engaged in various applications of radiation but are not necessarily experts in radiation protection. Since the quantities required for the quantification of exposure for the dose limitation are usually not directly measurable, other quantities which can be measured have been used instead. The relation of such quantities to dose limit quantities is not straightforward and may result in mistakes in interpreting the results of radiation monitoring.

The paper discusses the current state of quantification of exposure and points out some problems and inconsistencies regarding the definitions of some quantities used in radiation protection. Attention is paid in particular to the interpretation of the effective dose, equivalent dose, organ dose and other quantities needed for monitoring workers and workplaces. Special consideration is given to some contradictions related to the skin exposure of workers in nuclear medicine, where some ambiguous approaches are sometime applied to control and limit personal exposure.