

ASSESSMENT OF THE UNCERTAINTY OF THE RESULTS OF CONTROL OF AN INDIVIDUAL DOSE EQUIVALENT

Mr Sergey Natkha, Ms Alfia Shayakhmetova, Miss Darya Arefieva

Federal State Unitary Research institute of Industrial and Maritime Medicine of Federal Bio-Medical Agency, Saint-Petersburg, Russian Federation, niipmm.210@gmail.com

Introduction: Measurement of an individual equivalent of a dose ($H_p(d)$) consists of the accounting of arising errors. Therefore processing of results of a control is an important element providing reliability of the data. Uncertainty of results of radiation measurements is characterized by numerical values which can be attributed to measured $H_p(d)$. The basic quantitative expression of uncertainty of measurements is standard uncertainty.

Objectives: The objective of this work – to reduce the probability to get the dose that exceeds the limiting value.

Methods: Calculation of standard uncertainty is made with the help of two methods. In the first case calculation is carried out by processing of results of repeated measurements. In the second case they use for uncertainty calculation:

- data of the previous measurements of $H_p(d)$;
- data of a kind of a distribution of measurement results, etc.

Application of the first method is limited by necessity of carrying out repeated measurements. That is impossible in the conditions of performance of real works.

In the second case it is possible to present uncertainty of results of a radiation control in the form of borders of a departure of value of $H_p(d)$ from its estimation.

The most widespread method consists in application of the assumption of the even law of distribution of possible values of $H_p(d)$ in established (bottom and top) borders.

Results: The analysis of the results of individual doses of the personnel shows that in certain cases laws of distribution of possible values of $H_p(d)$ differ from even law. That essentially influences on results of estimations.

The analysis of the data of individual doses of the personnel presented in the established reporting forms is carried out. It has allowed to establish typical laws of distribution of $H_p(d)$ for various types of performing works in the conditions of influence of ionizing radiation.