The Mayak Worker Dosimetry System-2013 (MWDS-2013): Phase II—Quality Assurance of Organ Dose Calculations

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In order to check developed software tools, it was necessary to compare estimates of statistical characteristics of annual absorbed plutonium internal doses obtained by PANDORA and IMBA software with the same original data. The results were compared from dose calculations of five cases with different initial data on plutonium inhalation intake, lifetime measurements of plutonium activity in daily urine and post-mortem measurements in lungs, lung lymph nodes, liver and skeleton. Estimates of geometric mean and geometric standard deviation of annual regionally weighted lung dose and bone surface dose were compared. Satisfactory agreements of the estimates of statistical characteristics of annual doses to two critical organs for the selected cases were shown. One hundred individual hyper-realizations (forward model evaluations) are sufficient to calculate MWDS-2013 if only measurements of plutonium activity in daily urine are used, and 2000 individual hyper-realizations if both urine and autopsy measurement results are used.

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