

PREVISIONAL METHOD FOR THE EVALUATION OF WATER AND SEDIMENT
RADIOACTIVE CONCENTRATIONS IN A RIVER BASIN BASED ON ASSOCIATION
OF EXPERIMENTAL RESULTS AND HYDROLOGIC DATA

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For a given radioactive release in a river, the proposed method allows an estimation of radioactive level in water and sediment below a nuclear plant and this for every liquide (Ql) and solide flows occuring an hydrologic cycle.

Non disturbed turbid surface water collected in the river during periods of low-median and high flows are contaminated in laboratory with a mixture of gamma emitting radionuclides usually present in the liquid wastes of the tested nuclear plant.

Parallely a statement of the most important locations for use of the river is attempted. For every station transit time (Tt) from the release point is calculated by a mathematical model and this for every liquid flow of the river.

A graph called hydrologic radioactive graph (HRC) presents a very synthetic view of the radioactive situation in the river. For a given release rate expressed in Bq.s-1, we can directly read the corresponding values of activity in water, suspended or bed sediment in Bq Kg-1 (ordinate) versus distance dwonstream the release point (absciss).

This synthesis taken in account main parameters. (Tt, Ql, Qs) allows a very easy and quick evaluation of radioactive situation and is practical use to organize environmental surveillance, to calculate doses to man and to compare previsional and actual values.

The behaviours of cesium-quickly and moderately sorbed by sediment - cobalt, progressively and highly associated with suspended matter and iron which precipitates independantly of sediment load are presented, as examples.