

## **PUBLISHABLE FINAL REPORT**

**CONTRACT No.:** FIKR-CT2001-00160

**PROJECT No.:** FIS5-2001-00061

**ACRONYM:** IDEAS

**TITLE:** General Guidelines for the Estimation of Committed Dose from Incorporation Monitoring Data

**PROJECT CO-ORDINATOR:** Forschungszentrum Karlsruhe GmbH

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**REPORTING PERIOD:** 1 October 2001 to 30 June 2005

**PROJECT START DATE:** 1 October 2001     **DURATION:** 45 months

**DATE OF ISSUE OF THIS REPORT:** September 2005

**Euratom**

**Project funded by the European Community  
under the 5<sup>th</sup> Nuclear Energy framework  
programme (1998-2002)**

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Doses from intakes of radionuclides cannot be measured but must be assessed from monitoring, such as whole body counting or urinary excretion measurements. Such assessments require application of a model and estimation of the exposure time, material properties, etc. The aim of the project was to develop guidelines to standardise assessments of internal doses, based on research into the assumptions made, and developed by a group of experts in consultation with potential users. Further information is available at the project web site <http://www.ideas-workshop.de>.

To ensure that the guidelines are applicable to a wide range of practical situations, a database was compiled of cases of internal contamination that include monitoring data suitable for assessment. It contains information on over 200 cases, and more are being added, because it provides a valuable training resource.

In parallel, improved algorithms (mathematical methods) for assessing intakes and doses from bioassay data were developed and incorporated in existing software IMIE (Individual Monitoring of the Internal Exposure). A special version of IMIE was developed and distributed to the partners. A version of the IMBA Expert™ program (Integrated Modules for Bioassay Analysis) was also provided for use in the project.

About 50 cases from the database were assessed using IMIE, with at least two independent assessments of many of the cases. The results were collated, and differences in assumptions identified, with their effect on the assessed dose. From the results, and other investigations, draft guidelines were prepared, to provide a systematic procedure for estimating the required parameter values that are not part of the measurement data. A virtual workshop was held on the Internet, open to internal dosimetry professionals, to describe the database and evaluations, and to discuss the draft guidelines, which were revised accordingly.

An intercomparison exercise on internal dose assessment was then conducted, in collaboration with the IAEA, which was also open to all involved in internal dosimetry. Six cases were developed and circulated with a copy of the revised guidelines, which participants were encouraged to follow, to test their applicability and effectiveness. The results were collated and a Workshop held to discuss the results with the participants.

The guidelines were refined on the basis of the experience and discussion. They are based on a general philosophy of:

- Harmonisation: by following the Guidelines any two assessors should obtain the same estimate of dose from a given data set.
- Optimisation: the “best” estimate of dose should be obtained from the available data.
- Proportionality: the effort applied to the evaluation should be proportionate to the dose – the lower the dose, the simpler the process should be.

Following these principles, the Guidelines use the following “Levels of task” to structure the approach to an evaluation: Level 0: Annual dose < 0.1 mSv. No dose evaluation; Level 1: Simple evaluation normally using ICRP reference parameter values (typical dose 0.1-1 mSv); Level 2: Sophisticated evaluation using additional information to give more realistic assessment (typical dose 1-6 mSv); Level 3: More sophisticated evaluation, for cases with comprehensive data (typical dose > 6 mSv). The guidelines provide:

- Background information about the biokinetic models and the corresponding bioassay functions for the interpretation of monitoring data.
- Detailed information about the handling and evaluation of monitoring data.
- A structured approach to dose assessment consisting of a step-by-step procedure described in well-defined flowcharts with accompanying explanatory text.

The guidelines have been put forward as a basis for national and international guidance. They were developed in close collaboration with the ICRP Committee 2 Task Group on Internal Dosimetry (INDOS), which is developing a Guidance Document on internal dose assessment. The draft ICRP Guidance Document is following similar principles, and a similar structured approach to assessments based on the IDEAS Guidelines, but will relate to revised ICRP biokinetic models currently under development by INDOS.