PRACTICAL RECOMMENDATIONS
TO OCCUPATIONAL PHYSICIANS
FOR MEDICAL MONITORING AND DOSE ASSESSMENT
OF INTERNAL EXPOSURE
OF NUCLEAR WORKERS TO RADIONUCLIDES

Dr. Nicolas Blanchin
OBJECTIVES OF THIS WORK

• A reference guide to good practices in order to harmonize:
  – the set up of individual monitoring programs
  – the interpretation of the results and the estimate of intake and dose
  – the evaluation of the risk associated with a committed effective dose and the communication with the employees and the employer

• Intended for radiobiologists and occupational physicians in charge of workers in a basic nuclear facility: 450 occupational physicians in France

improvement in monitoring the workers in basic nuclear facilities potentially exposed to a risk of internal contamination: 64,000 employees in France
HISTORY OF THE WORK

• In 2004: Constitution of a task group (physicians - biologists - experts) in order to share their practice in actual cases of internal dosimetry and to build a methodological reference frame

• Since 2008: Follow-up of the method of “recommendations for the clinical practice” made by the French National Authority for Health (HAS)

• Under the promotion of the French Society of Occupational Medicine (SFMT)

• In April 2010: group of 50 reviewers for the quotation from 1 to 9 of the 128 recommendations on 3 criteria: relevance - legibility - applicability

• Since Septembre 2010: taking into account the remarks of the group of reviewers and finalization of the document (14 days of meeting in 2010…)

• March 2011: The documents was sent the to the HAS

• The label has been obtained in July 2011
Elaboration of the questions coming from the professional practice

For each question: bibliographical review + experience feedback of the professional practices

For each question: Argumentation and Position of the task group

1 group of recommendations for each question with gradation according to basis: regulation, literature with level of evidence (A, B, C) or professional agreement

Validation by a group of reviewers

Revising of the document after the reviewing stage

Examination by the HAS
1st OBJECTIVE:
To improve the implementation of monitoring programs

1. Need to evaluate the risk of exposure:
   - After actual incident or abnormal situations (special monitoring)
   - In normal situations (routine monitoring)

2. Define individual monitoring adapted to the circumstances, specifying:
   - type of analysis
   - frequency of analysis
   - conditions of analysis

3. Periodically evaluate the relevance of these monitoring programs
2nd OBJECTIVE:  
To optimize the estimate of the dose

1. How to choose the parameters of the ICRP model according to the available data:
   – date and route of intake
   – physico-chemical form

2. How to use operational levels for quick interpretation of the results

3. How to use curves and abaci of the ICRP publication 78

4. How to validate the result of an estimate through the consistency of:
   – the various results of analysis with the selected model
   – the estimate with the data of exposure
   – the results of the employees between them

5. When calling upon expertise, taking into account uncertainties:
   – dependent on the analyses
   – dependent on the model of the ICRP and its parameters
   – dependent on the physiological parameters
3rd OBJECTIVE:
to estimate the health risk associated with a dose

1. For which level of committed effective dose is it necessary to raise the question?

2. How to evaluate the risk?
   – determinist
   – stochastic

3. How to communicate on the subject?
   – worker concerned
   – employer, staff representatives, authorities
DISTRIBUTION OF THE DOCUMENT

Layout:
- a summary (4 pages)
- an information sheet for the workers
- a short document (60 pages) with the recommendations and an explanation of the work method
- complete document (250 pages) with the recommendations plus: bibliographical analysis - argumentation and technical appendices

Access: on the website of the SFMT:
MEMBERSHIP OF THE TASK GROUP

Anne-Laure Agrinier (CEA Marcoule),

Philippe Bérard (CEA FAR),

Eric Blanchardon (IRSN FAR),

Nicolas Blanchin (CEA Cadarache),

Laurent Bourgaud (CEA Saclay),

Cécile Challeton de Vathaire (IRSN FAR),

Robert Fottorino (CEA Cadarache),

Didier Franck (IRSN FAR),

Paul Fristch (CEA BIll),

Michèle Gonin (EDF, Paris),

Jean Piechowski (CEA),

Benoît Quesne (AREVA Marcoule)