Modelling and Data for Radiological Impact Assessments “MODARIA”

WG 5 – Uncertainty and variability analysis for assessments of radiological impacts arising from routine discharges of radionuclides.
As the effective dose cannot be measured directly, values of this quantity must be inferred with the aid of models, usually involving environmental, metabolic, and dosimetric components.

Ideally, these models and the values chosen for their parameters should be realistic, so that the results they give can be described as ‘best estimates’.

Where practicable, estimates and discussion should be made of the uncertainties inherent in these results”

ICRP 103 (par. 320)

Identified tasks

Methodology (JC Mora, A. Curti, Anna Mª Blixt-Buhr)

Identify possible tools (All)

Identify scenarios. Hypothetic & Realistic discharges scenario (Iurii Bonchuk, F. Vermorel, C. Mourlon)

Level of conservatism of assessments (D. da Costa Lauria and J. Shen)

Sources of uncertainties (C. Mourlon, F. Vermorel)

A priori sensitivity analysis (L. Marang)

Distributions of parameters and data to be used (I. Bonchuk and C. Mourlon)

Identification of correlation factors (S. Chouhan and P. Krajewski)

Environmental monitoring data (B. Zorko and P. Chyly)

Applications: deterministic and probabilistic assessments (SAUA) (All)

Communication of results (routine releases including SAUA) (A. Curti, Anna Mª Blixt-Buhr)
20 Participants (13 countries)
### Progress

#### Methodology (JC Mora, A. Curti, Anna Mª Blixt-Buhr)

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<thead>
<tr>
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<th>Prospective</th>
<th>Retrospective</th>
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<tr>
<td><strong>Deterministic</strong></td>
<td>Source term: fixed hypothetical</td>
<td>Environmental concentrations: based on measurements and/or estimations</td>
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<tr>
<td></td>
<td>Parameters: best estimates</td>
<td>Source term: derived from measurements</td>
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<td>Habit data: 95th percentile for the major contributor (best estimate the rest)</td>
<td>Parameters: measured and/or best estimates</td>
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<td>Dose coefficients: fixed</td>
<td>Habit data: Preferably local survey (focused in the representative person). Fixed</td>
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<tr>
<td></td>
<td>Parameters: pdfs</td>
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<td></td>
<td>Habit data: fixed (not variability)</td>
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Progress

Distributions of parameters and data to be used (I. Bonchuk and C. Mourlon)

- Joint meeting with WG4: Identified the need to have a pdf for certain parameters (N>20 → GM and GSD)
- Dan Galeriu and Anca Melintescu (H3 and C14)
Progress

Identification of correlation factors (S. Chouhan and P. Krajewski)
Progress

Applications: deterministic and probabilistic assessments (SAUA) (All)

- Input data/parameters values
  - Probabilistic simulations
- Temporal scenario hypotheses
  - Deterministic calculations
- Spatial scenario hypotheses
  - Deterministic calculations

Histogram of the parameter values (Sv = 1)

Dose, mSv
Progress

Communication of results (routine releases including SAUA) (A. Curti, Anna Mª Blixt-Buhr)

- Previous generic work identified
- Task will be focused in communication of results including uncertainties for routine releases.
14 Presentations + 2 joint meetings (WG2 and WG4):

I. Bonchuk “Atmospheric release”
P. Carny, D. Suchon “ESTE code”
D. da Costa “Genii”
S. Chouhan “Correlation factors and SA”
A. Curti, Anna Mª Blixt “Communication in routine releases”
D. Galeriu “Romanian experience with CANDU”
J.C. Mora “Chinon – CROM7”
C. Mourlon, F. Vermorel “Chinon – Symbiose”
C. Mourlon “The Forge”
G. Proehl “Revision of SRS 19”
J. Simmonds “Realistic retrospective dose assessment”
K. Thiesen “Data Sets for Uncertainty Analysis”
J. Tomas “Comparison of models and data including uncertainties”
C. Yu “Conservatism of the assessments”
Future

- Continuous advance of each task
- Peer review of the report
- Possible articles (ICRER, Pawel, Benjamin, Anca, Adriana, Iurii, Juan C.)
- Refinement of calculations with different tools and new data
- Comparison deterministic/probabilistic
Next meeting to be held in Spring 2014
Thank you!

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