

NATIONAL DOSE ASSESSMENT WORKING GROUP

PAPER 7-06: REPORT BACK FROM SUB-GROUP ON UNCERTAINTY AND VARIABILITY IN DOSE ASSESSMENTS

Progress Report from the NDAWG Sub-Group on Uncertainty and Variability

Production of Documents

The sub-group's first document 'An Overview of Uncertainty and Variability in Radiological Assessments' has been completed and published on the NDAWG web-site. At its meeting on 23 February the sub-group discussed the first draft of its second document 'Reviewing Uncertainty and Variability in Dose Assessments'. The production of this report is in hand and the sub-group intends presenting the paper at the autumn meeting of the NDAWG.

Progress Against Terms of Reference and Future Activities

At the meeting in February the subgroup considered its progress against its terms of reference, which are:

1. Review and comment on FSA's use of 'possible' and 'probable' dose.
2. Consider the extent to which assessments should be probabilistic, i.e. a range of doses is estimated rather than a single value.
3. Consider issues and studies relating to uncertainty and variability in dose assessments, including the availability of input data.
4. Consider issues relating to compliance with dose limits and constraints when probabilistic assessments are carried out.
5. Consider how probabilistic results can be presented to the public.

The sub-group believes that item 1 has already been dealt with. The first paper has addressed item 2 and the second paper will address item 3. Item 4 has been addressed by the 'Principles Document'. The sub-group believes that item 5 is part of a wider issue of communication in dose assessment which goes beyond the remit of the sub-group. It is therefore recommended that the NDAWG considers other means of dealing with this matter such as the establishment of a sub-group dealing with communications issues. If the NDAWG agrees the sub-group intends to disband after production of the second document.

The sub-group will produce a brief report summarising the work that has been done by the sub-group for the autumn NDAWG meeting. This will complement the second document from the sub-group, 'Reviewing

Uncertainty and Variability in Dose Assessments', which will also be presented at that meeting.

David Webbe-Wood
15 April 2005

Record of 4th meeting

5th meeting held on 23 February 2005, Aviation House London.

Present

Chair	David Webbe-Wood	FSA	
Regulators/agencies	Cathy Griffiths	RWMAC	
	Ray Kowe	NRPB	
	Jane Simmonds	NRPB	
Specialists/NGOs	Kate Charles	Westlakes	Scientific
	Consulting		
	Marcus Grzechnik	CEFAS	
	Mike Thorne	Consultant	

Apologies: David Brazier EA

1. Introduction

The Chairman and members congratulated Cathy on the recent award of her OBE.

2. Minutes of previous meeting 7 October 2004

All actions have been completed.

The first report of the subgroup "An overview of uncertainty in radiological assessments" has now been published on the NDAWG website as paper NDAWG/1/2005.

3. Matters arising

There were no matters arising.

4. Production of second report 'Performing assessments in the presence of uncertainty'

David has produced with major contributions from members of the group, a draft document which he has circulated to members.

Jane commented that the subgroup needs to consider what the report should be trying to achieve.

David said the report was aimed at someone who has a background in radiological assessment. It should be a guide as to what they should be addressing on uncertainty.

Jane said that principle 12 of the principles documents recommends that if the estimated dose exceeds 0.02 mSv yr^{-1} you have to carry out

uncertainty analysis, but does not give much guidance on how to proceed. This is a starting point for the subgroup's second report.

The report is aimed at people between two extremes: those where doses are so low that they do not have to consider uncertainty and people who have to assess uncertainty as an integral part of nuclear licensed site assessments (e.g. for Sellafield). Cathy added that the middle ground would cover non-nuclear users and radiological safety advisors in general.

Mike commented that we should give advice on how to avoid doing an uncertainty analysis unless it is strictly necessary. Thus, for example, if the assessed dose from an initial assessment exceeds 0.02 mSv yr^{-1} then you should carry out a revised deterministic assessment taking appropriate site-specific data into account, before concluding that an uncertainty analysis is required. Jane said perhaps the report could say for certain issues that the user should go and seek advice from an expert with proven experience, not necessarily in uncertainty but in exposure pathways and assessment modelling. Mike suggested that apart from the level of dose involved, another reason to seek expert assistance would be if unusual radionuclides or pathways are involved.

David and Kate suggested a check list or flow chart on what are the things to look out for that would flag when help would be required. Mike and Jane said that the BIOMASS 6 (2003) report and IAEA Safety Series 19 contain examples of such flow charts, though developed in rather different contexts.

Action 5.1 David Webbe-Wood to draft a flow chart or equivalent for the report.

Members decided the following would not be considered in the report:

- Guidance on specific uncertainty analysis software
- Use of uncertainty analysis for research
- Uncertainty in factors such as dose coefficients or other factors for which point values are recommended by international bodies such as the ICRP.

Members agreed on a proposed change of title for the report 'Reviewing non-nuclear radiation dose assessments taking into account uncertainty'

Structure of document

Members agreed that the order of the sections of the report would be:

1 Introduction - incorporating what the report is setting out to achieve, that it is based on principles documents, who it is aimed at, i.e. assessors of discharges from non-nuclear establishments, and how practical experience tells us that this is a real problem.

2 A broad section incorporating section 4 of the draft document.

3 An outline of an interactive/staged approach stating what endpoints need to be considered.

4 Conclusions

Appendix of examples of real world assessments which broach uncertainty.

Cathy stated that the Small Users Liaison Group (SULG) had recommended Ciaran McDonnell's W63 report 'Radiological assessments for small users' to replace his early M774 report. She cited a recent assessment that used W63 for the Weston Park hospital complex, Sheffield. W63 overestimates doses in some cases and underestimates in other cases. An assessment of radio-iodine discharges was giving an estimated dose of 119 μSv using W63 but was substantially reduced once site specific data was used in a repeat deterministic assessment.

Action 5.2 Cathy to write a two page summary of this assessment for the appendix of the report.

Action 5.3 Jane to draft section 3 of the report including members comments on sections 2 and 3 of draft document.

Action 5.4 Subgroup members to comment on sections 2 and 3 of the draft document. (Noting that comments from Mike had been received prior to the meeting.)

The following timescale was suggested:

The second report will be finalised and communicated to the main NDAWG group for the November meeting.

Members will send their comments on sections 2 and 3 of draft document to Jane by 4th March.

Authors will complete their sections and submit them to David by the end of March.

David will prepare the second draft of the report to circulate to members of the subgroup by the end of April.

5. Future activities of the subgroup/progress against the terms of reference

Members agreed that the first term of reference "Review and comment on FSA's use of 'possible' and 'probable' dose" had been fully addressed.

The second and third terms of reference had been covered by the first and second reports.

The fourth term of reference "Consider issues relating to compliance with dose limits and constraints when probabilistic assessments are carried out" is covered by the principles documents.

Members agreed that the fifth term of reference "Consider how probabilistic results can be presented to the public" was wider than the remit of this subgroup. It was suggested that a new subgroup should be set up when the work of the uncertainty subgroup has finished to consider this term of reference.

Action 5.5 David Webbe-Wood to report to the main NDAWG meeting in April the work done by the subgroup to date and suggest that the subgroup should be disbanded upon completion of the second report in November.

6. AOB

Ray asked members if there any issues arising from the second report which could be taken forward to the new modelling subgroup that was meeting in April. Members agreed that there was a crossover of some modelling aspects but that these should wait to be identified and expanded upon until the new modelling subgroup had finalised their terms of reference.

Cathy had several modelling queries from the non-nuclear user's perspective. Jane suggested the next main NDAWG meeting which was focussing on small user assessments would be a better forum to address such queries. Cathy said she would communicate these to Jane before that meeting.

7. Date of next meeting

Sometime late September was suggested as the date for the next meeting.

8. Summary of Actions

Action 5.1 David Webbe-Wood to draft a flow chart or equivalent for the report.

Action 5.2 Cathy to write a two page summary of this assessment for the appendix of the report.

Action 5.3 Jane to draft section 3 of the report including members comments on sections 2 and 3 of draft document.

Action 5.4 Subgroup members to comment on sections 2 and 3 of the draft document. (Noting that comments from Mike had been received prior to the meeting.)

Action 5.5 David Webbe-Wood to report to the main NDAWG meeting in April the work done by the subgroup to date and suggest that the subgroup should be disbanded upon completion of the second report in November.

Ray Kowe, 25 February 2005