

## NATIONAL DOSE ASSESSMENT WORKING GROUP

### SUMMARY OF AGREEMENTS AND ACTIONS FROM 7<sup>TH</sup> MEETING

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7<sup>th</sup> Meeting held on 27<sup>th</sup> April 2005, Aviation House London.

#### 1. Present

Chair	John Cooper	HPA
Members	Rob Allott	EA
	Laurence Austin	British Energy
	Lucy Bailey	Nirex
	Stuart Conney	FSA
	Darren Cutts	FSA
	Paul Dale	SEPA
	Michael Gaunt	Rolls-Royce
	John Hunt	CEFAS
	Ray Kowe	HPA
	Simon Morgan	Nirex
	Tim Parker	BNFL
	Jane Simmonds	HPA
	Patrick Stephen	NII
	Mike Thorne	Mike Thorne and Associates Ltd
	John Titley	EA
Speakers	Ciaran McDonnell	HPA

#### Apologies:

Philip Day	University of Manchester
Cathy Griffiths	Consultant
Steve Jones	Westlakes Scientific Consulting
Barrie Lambert	Consultant
Robert Larmour	Dept Environment (NI)
Ken Ledgerwood	Dept Environment (NI)
Will Munro	FSA Scotland
Havard Prosser	National Assembly for Wales
Pete Roche	Consultant representing Greenpeace
David Tattam	GE Healthcare
David Webbe-Wood	FSA
Chris Wilson	DEFRA

The Chairman announced the following changes to membership:

Paul Dale (SEPA) is standing in for George Hunter

Simon Morgan and Lucy Bailey (NIREX)

Dr David Tattam for GE Healthcare replacing Paul Marks

Chris Wilson (DEFRA) replacing Andrew MacPherson

The Chairman welcomed back Laurence Austin after illness, and congratulated Cathy Griffiths on being awarded an OBE from the Queen, which accounted for her absence at today's meeting. He informed members of the sad death of Frances Fry a long time employee of the NRPB, former President of the SRP and member of ICRP Committee 2.

## 2. Actions from the fifth meeting and matters arising (Paper 7-01)

Action 5.6 The FSA and CEFAS to submit an amended paper (cut down and taking account of members comments) to be published as an NDAWG paper. *Completed, members agreed to its publication as an NDAWG paper, Mike Thorne passed on some typographical changes to the Secretariat which will be included in the text.*

Action 6.1 Secretariat to include protection of biota on the NDAWG agenda on an annual basis in liaison with Steve Jones and John Titley and to put papers on website. *Completed, papers are now on the website and the topic will be an agenda item at the next meeting.*

Action 6.2 Steve Jones to email Jane with an addition to the paragraph about uncertainty. *Completed and incorporated in report.*

Action 6.3 The secretariat will redraft the report of comments on the ICRP recommendations and recirculate to members before submission to the ICRP before the 31/12/2004 deadline. *Completed and NDAWG comments sent to ICRP.*

Action 6.4 Members to comment on the first paper from the Uncertainty subgroup by the end of 2004, David Webbe-Wood to finalise the document for publication on the website by the end of January 2005. *Completed, paper published as NDAWG/1/2005.*

Action 6.5 The Secretariat will prepare an item on NDAWG activities, papers and the website for publication in the news section of the Journal of Radiation Protection. *Sent to JRP and we hope it will be included in next issue.*

Action 6.6 Action on the Steering group to consider if another CEDA meeting is required. *Completed, an alternative open meeting was discussed in the NDAWG review (paper 7-10).*

Action 6.7 All to suggest possible members for the modelling subgroup and to comment on the proposed terms of reference by the end of December 2004. *Completed, report back from the first meeting of modelling subgroup held in April 2005 was discussed in paper 7-07.*

- The Chairman informed members that the ICRP had now published five support documents for the 2005 recommendations on the web. These are:
- The optimisation of radiological protection.
- Assessing dose of the representative individual for the purpose of radiation protection of the public.
- Biological and epidemiological information on health risks attributable to ionising radiation: a summary of judgements for the purposes of radiological protection of humans.
- Basis for dosimetric quantities used in radiological protection.
- The concept and use of reference animals and plants for the purposes of environmental protection.

The deadline for comments on the first two documents is the 10<sup>th</sup> July, and the 24<sup>th</sup> July for the last three documents.

The Commission will finalise the recommendations following comments on the supporting documents and there will then be a three month period for further comments after which the revised recommendations will be published, probably sometime in 2006. Members agreed to comment on the supporting documents as a group.

**Action 7.1** NDAWG members to comment on the two ICRP foundation papers 'The optimisation of radiological protection' and 'Assessing dose of the representative individual for the purpose of radiation protection of the public' by the end of May.

**Action 7.2** Secretariat to collate comments on the two ICRP foundation papers and circulate to members for approval by email

**Action 7.3** Secretariat to collate any comments on the three other ICRP foundation papers and circulate to members for approval by email

### 3. Localised pie charts (Paper 7-02)

Jane Simmonds presented a paper summarising the average annual dose to the UK population and the breakdown by different sources of radiation. Two sets of charts (pie and bar) show the variation in dose in two countries Cornwall and Cumbria. The charts are based on HPA data and the charts for Cumbria incorporate data from RIFE. Jane informed members that the intention is to add

more counties and to put the charts on the NDAWG and HPA websites so that the public could access the data on a clickable map of the UK.

Members agreed that this would be a very useful source of information and suggested the following:

It is very important to trial the charts on members of the public to ensure that the material is easy to understand and is what is required. HPA will therefore, trial the two charts and decide on the final presentational format for the next meeting.

It would be useful to put actual doses as well as percentages on the pie charts.

It can be misleading to include medical exposure and therefore two sets of charts for the UK average doses will be produced, with and without medical. Medical exposure will not be included in the breakdown by county.

In addition the HPA should consider whether critical group doses as well as average doses should be estimated for counties other than Cumbria and whether the charts should distinguish between natural and anthropogenic sources. The possibility of including data for the sites included in RIFE and say for Heathrow (to include a frequent flyer) should also be considered. In addition the basis for the numbers needs to be presented in some way.

#### **4. EA's Initial radiological assessment methodology (Paper 7-03)**

Rob Allott outlined the Environment Agency's initial radiological assessment methodology which is based on the use of dose per unit release data which have been derived using generic assumptions. Recently published principles and guidance for the prospective assessment of public doses recommends that the first step in undertaking an assessment would be to carry out an initial radiological assessment using simple generic assumptions. If the resultant dose is more than  $20 \mu\text{Sv y}^{-1}$  then a more detailed assessment using site specific assumptions should be undertaken. The methodology provides for the inclusion of more site specific information to make the assessment more realistic. The methodology is used internally within the EA as part of the Agency's Management System and comprises guidance and a series of spreadsheet tools. The EA is considering external publication of the methodology and release of the spreadsheet assessment tools.

#### **5. Issues for small users – NRPB W63 (Paper 7-04)**

Ciaran McDonnell presented an overview of report NRPB-W63 which is an update of NRPB-M744 which was published in 1994. W63 provides an assessment methodology that can be referenced and can be used for individual assessments that ensures a common approach by RPAs within HPA. It all seeks to allow non-nuclear ('small') users a means by which they could undertake

assessments themselves if for example they are for whatever reason unable to employ paid specialist consultants. It brings together several methodologies for assessments of aerial releases and discharges to drains and rivers. The figures in W63 have been produced on spreadsheets which are not generally available to users and only the figures that appear in the text of the report have been fully checked..

There then followed a general discussion on papers 7-03 and 7-04. The Chairman asked members to consider what they think are the important dose assessment issues for small users and to identify what NDAWG can do to help them.

Jane Simmonds passed on comments from Cathy Griffiths. In particular, many small users do not have experience in carrying out assessments and have often adopted very simplistic methods. These were thought to be cautious but often this has been found not to be the case. The issue of how to treat generic discharges, e.g. 'other beta/gamma' also led to difficulties in dose assessment. Cathy Griffiths had also raised several points regarding assumptions leading to source terms where she would welcome input from NDAWG. However, it was not clear whether this was beyond the remit of the group. Several other issues were raised in discussion including: the assessment of external doses from radioactivity on river banks, sewage sludge to land equilibrium transfer factors, the need for national habit data for small user assessments supplemented by local data for freshwater fish consumption, the assessment of doses to the fetus in addition to other age groups. An important issue was the fate of phosphorus-32 in river systems where uncertainties over concentration factors were significant and the recent HPA (NRPB) advice on protection of the fetus could have implications for assessment of P-32 discharges in future.

The Chairman suggested that the group should put together a list of issues for small users and should recommend monitoring/research relevant to areas where phosphorus-32 is suspected in fish. When the work of the subgroups is being reviewed, NDAWG will consider whether small user issues are being addressed. It was agreed that freshwater exposure pathways might be a topic that should be considered by the subgroup on modelling.

**NDAWG recommends that there is the need for national research on the transfer of phosphorus radioisotopes to fish. This should include monitoring of fish and water in areas where such isotopes are known to be discharged.**

**Action 7.4** Secretariat to compile a list of issues for small users of radioactivity.

## **6. Assessing doses from radionuclides disposed of in sewage sludge (Paper 7-05)**

John Titley and Darren Cutts presented a joint EA and FSA paper on the assessment of doses from authorised discharges of radionuclides to sewers in

England and Wales. The methods for modelling doses from the disposal of radionuclides with liquids to sewers were presented. These showed the different treatment stages the discharge may pass through and the exposures that may occur with each. The key areas in which the FSA is funding research were outlined.

There are several available models for assessing doses from discharges to sewers (e.g. Mike Thorne's Amber based model, RPD-HPA's Smart model). Rob Allott commented that if models are going to be used for regulation the differences in the results need to be understood and this could be achieved by model intercomparison. Jane Simmonds added that any comparison should not just consider differences in the model processes but also in the underlying assumptions (for example the time of application of sludge) and an important part of the comparison would be agreeing on the model scenarios.

**NDAWG recommends that it would be useful to compare the results of different methods for assessing doses from discharges to sewers, including the FSA's concentration per unit disposal values and the EA's initial assessment methodology values.**

Ciaran McDonnell asked if the values for dose per unit disposal perhaps for a limit range of sludge 'types' could be were available as these could be used by small users for scaling their assessments. Members agreed that this would be a useful thing to produce.

There was also a discussion about sulphur-35 and iodine-125 for which distinctions in chemical speciation are an issue. This affects their transfer from sewage sludge used in land treatment to plants. These (and similar) nuclides were included in the list of key areas for further work at the first meeting of the subgroup on modelling.

## **7. Report back from Subgroup on uncertainty and variability in dose assessments (Paper 7-06)**

In David Webbe-Wood's absence Jane Simmonds informed members of the work of the Subgroup and progress against the terms of reference.

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. The second report 'Reviewing non-nuclear radiation dose assessments taking into account uncertainty' will be finalised for discussion by the main NDAWG group at the November 2005 meeting. This report will give advice to users who are estimating doses of more than  $20 \mu\text{Sv y}^{-1}$  and is primarily aimed at hospitals.

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 felt to be covered by the recommendations in the principles documents.

Subgroup members agreed that the fifth term of reference "Consider how probabilistic results can be presented to the public" was part of a much wider issue and so was outside the remit of this subgroup. It was suggested that the subgroup should be disbanded upon completion of the second report in November 2005 and that a new subgroup should then be set up to consider this term of reference.

The main NDAWG group agreed that the subgroup on uncertainty and variability should be disbanded on presentation of the second report at the main NDAWG November meeting and that a new subgroup on communication should then be set up.

## **8. Report back from Subgroup on modelling (Paper 7-07)**

Rob Allott informed members that the subgroup was happy with the terms of reference which had been set out by the Steering group. The subgroup will focus on routine releases distinguishing between continuous and short term releases and would not consider accidental releases or solid waste which may be future issues for the main NDAWG group.

At the first meeting the subgroup had considered where there were inadequacies in models and data. For models which are validated against measured data, the general consensus is that a factor of 3 difference between the two is viewed as adequate, whereas a factor of ten or more would generally be felt to be inadequate, depending on the estimated level of dose.

Subgroup members completed a matrix for investigating the adequacy of models for releases of radionuclides to air and freshwater and marine environments. The release of radionuclides to sewers was not considered at the first meeting of the sub-group as it was an issue for today's meeting.

Subgroup members were then able to identify future areas for work and key areas of uncertainty in dose assessments.

**Action 7.5** Secretary of the modelling group to invite a Nirex representative onto the modelling subgroup.

## **9. Report back from Subgroup on habits data and critical groups and draft paper for discussion (Paper 7-08 and 7-09)**

Mike Thorne informed members that the 3<sup>rd</sup> meeting of the subgroup was devoted to revision of the position paper on the collection and use of habits data for retrospective dose assessments. The report has been sent to George Hunter (SEPA) and Ken Ledgerwood (NI) and the subgroup were awaiting comments. Mike then gave a presentation summarising the paper.

Subgroup members agreed that although there is potential further work for the subgroup to undertake, e.g. in expanding on issues identified in the position paper and giving consideration to the use of habits data in prospective assessments, it was considered inappropriate to formulate a programme of work until the position paper had been discussed by the NDAWG. It is anticipated that the subgroup will meet again in the autumn, but no date has yet been agreed for that meeting.

Rob Allott asked if the subgroup could advise on what to do where there are only a few data available in the RIFE compilation, and on what should be done to find out how much locally produced food people eat. He also commented that a linkage between habits data and monitoring data would be useful. Jane raised the issue of the need for national data particularly for infants and children where the local habit surveys were weak.

**Action 7.6** NDAWG members will send written comments on the habits subgroup position paper to Mike Thorne, copied to the Secretariat, by mid June. The habits subgroup will prepare a final version of the position paper for the Autumn NDAWG meeting.

## 10. Report back from members

### 10.1 *FETAL DOSE*

The Chairman informed members that the document 'Guidance on the application of dose coefficients for the embryo and fetus from intakes of radionuclides by the mother' was now on the HPA website.

### 10.2 *MAGNOX*

Laurence Austin informed members that as of 1<sup>st</sup> April owner/operators of BNFL, Magnox Electric and UKAEA sites became mere operators as the NDA took ownership. Magnox Electric plc became Magnox Electric Ltd (very small change to name, same Company). The NDA intends to contract out operation of sites competitively, which may result in fragmentation of the Magnox fleet. Sites are being made "self-sufficient" in preparation and as a result the head-count at Berkeley is being reduced to ~ 250. Laurence will be joining British Energy at Barnwood from 1st June, but will continue to be the representative of the nuclear power operators on NDAWG for the time being.

### 10.3 *NUCLEAR INSTALLATIONS INSPECTORATE*

Patrick Stephens informed members that the Health and Safety Executive (HSE) have appointed Mike Weightman as HSE's Director of Nuclear Safety and HM Chief Inspector of Nuclear Installations, and that Kevin Myers is to be Director of Hazardous Installations.

#### 10.4 ROLLS ROYCE

Mike Gaunt informed members that should NDAWG wish to seek any information/support from the Nuclear Industry Safety Directors Forum they should use Rolls-Royce as the point of contact.

#### 10.5 NIREX

Simon Morgan informed members that as from 1<sup>st</sup> April Nirex became independent of the nuclear industry. The changes include the transfer of Nirex's shares to a new holding company owned by the UK Government and the appointment of a new Board. The shares in Nirex, previously owned by the nuclear industry, have been acquired by a new Company Limited by Guarantee, jointly owned by the Department for Environment, Food and Rural Affairs and the Department of Trade and Industry.

#### 10.6 SEPA

Paul Dale informed members that the revised assessment on the impact of Dounreay particles will be available before the SRP conference in June.

### 11. NDAWG review (paper 7-10)

#### 11.1 TERMS OF REFERENCE

Members reviewed the terms of reference to see whether they were being carried out. The following specific points were raised:

1. To facilitate the exchange of data and views between all parties on assessment methodologies. *Members concurred that this had been covered at today's meeting.*
2. To advance the understanding between groups who are likely to have differing objectives and views on dose assessment methods. *The recommendation of a comparison of dose assessments for authorised discharges shows that the group is active on this matter. The absence of NGO's at today's meeting and several subgroup meetings was noted by members.*

**Action 7.7** The Secretariat to email NGO's to say that their presence was missed at the 7<sup>th</sup> meeting and that members hoped that they would be able to attend further main NDAWG and subgroup meetings.

3. To meet on a regular basis (every 6 months) to discuss matters of mutual concern, and developments arising out of research, case histories (e.g., recent consultations) or changes in government policy. *This is being addressed.*

4. To identify, discuss and evaluate research which will progress dose assessment methods. *The discussion of phosphorus-32 had shown this TOR is being actively pursued.*
5. To initiate debate beyond the group on key issues, as necessary (for example via the Society for Radiological Protection). *Members agreed that the group was partly doing this. They suggested that an NDAWG representative could give an outline of the function of the group at the SRP conference in June.*
6. To keep abreast of international developments on dose assessment methodologies, and to provide feedback to the appropriate UK authorities for input into EU bodies. *NDAWG activities showed that this TOR was being addressed.*
7. To facilitate the development of coherent transparent methods for the assessment of radiation dose to the public from all pathways which arise as a result of the operations at nuclear and non-nuclear sites. *The habits subgroup position paper and the NDAWG paper on the total dose methodology for RIFE are felt to contribute to the development of coherent methods.*

### 11.2 FUTURE WORK PROGRAMME

This NDAWG Steering group have suggested holding an open meeting rather than a CEDA type meeting sometime in 2006 to consider NDAWG progress against objectives. Members were asked for their views. A two day open meeting in London with an independent chair (Bryn Bridge) was the preference for members with the following format:

Presentations on what we've done (first day)

Future work programme, breakout groups, wider discussion session (second day).

There was a suggestion that the meeting could be held in conjunction with SRP though the funding arrangements would have to be sorted out. This was discussed but the conclusion was that involving SRP for this meeting was not practical.

Members agreed that it would be sensible to swap the NDAWG meeting 9 'Open meeting to review NDAWG' with meeting 10 on 'Short term releases, the use and calculation of collective dose' to give more time to organise the open meeting in 2006.

### 11.3 WEBSITE

The website has received a favourable amount of interest with total of 4750 visits between November 2004-March 2005, with 2999 files downloaded. The most popular paper accessed (over 1000 hits) is the research list so members are requested to keep sending in research information.

### *11.4 NDAWG MEMBERSHIP*

The Secretariat is still seeking a Local Authority representative on NDAWG. Members are encouraged to put forward suggestions for this post.

**Action 7.8** Simon Morgan to forward details of LGA special interest group to Secretariat as a contact for a nominee for a Local Authority representative on NDAWG.

The Secretariat has contacted the NDA for a representative and are awaiting a reply.

## **12. Date of next meeting**

The next meeting will take place on Tuesday 15<sup>th</sup> November 2005 at FSA, Aviation House, London.

## **13. Summary of Actions**

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NDAWG Secretariat 3 May 2005