

NATIONAL DOSE ASSESSMENT WORKING GROUP

SUMMARY OF AGREEMENTS AND ACTIONS FROM 14TH MEETING

14th Meeting held on 26th November 2008, Ergon House (Defra), London.

Final version 1

1 Present

Chair	John Cooper	HPA
Members	Rob Allott	EA
	Laurence Austin	British Energy
	Steve Chandler	Dept of Energy and Climate Change (DECC)
	Stuart Conney	FSA
	Andrew Corns	GE Healthcare
	Ian Fairlie	Consultant
	Gerald Hudd	Somerset County Council
	John Hunt	Consultant
	Steve Jones	Westlakes Scientific Consulting
	Paul Kennedy	FSA
	Peter Marsden	University College London Hospital
	Wayne Oatway	HPA
	Jane Simmonds	HPA
	Patrick Stephen	NII
	Jill Sutcliffe	Consultant
	John Titley	EA
	Mike Thorne	Consultant
	David Webbe-Wood	FSA
	Invited speakers	Sue Nowak
James Penfold		Quintessa
Jim Smith		University of Portsmouth
Apologies:	Bob Beveridge	MOD
	Paul Dale	SEPA
	Katie Davis	NDA

Philip Day	University of Manchester
Michael Gaunt	Rolls-Royce
Stuart Hudson	Scottish Executive
Barrie Lambert	Consultant
Robert Larmour	Dept Environment (NI)
Will Munro	FSA Scotland
Tim Parker	BNFL
Havard Prosser	National Assembly for Wales
Catherine Retberg	Springfield Fuels
Pete Roche	Consultant

The Chairman welcomed Wayne Oatway who has taken over the role of the secretary from Ray Kowe, together with James Penfold and Jim Smith, who were invited to give presentations at this meeting.

2 Minutes of last meeting and matters arising (Paper 14-01)

Action 13.1 Patrick Stephen to inform NDAWG of the Norm Working Group response to the guidance notes. *Completed*

Action 13.2 John Titley to send the secretary the EA authorisation consultation process document for distribution amongst members. *Completed*

Action 13.3 Jane Simmonds to add the communications subgroup guidance note to the list of future guidance notes with a timescale for completion of 2009. *Completed*

Action 13.4 Paul Dale to send Rob Allott data on seasonality in fish consumption. *Completed*

Action 13.5 Matthew Castle to send John Titley information on how industry uses habit data which will be included in the paper on prospective dose assessments. *On going John Titley had sent Mathew reminders about this but had yet to receive the required information. Action moved from Matthew Castle to Laurence Austin.*

Action 13.6 John Titley to ensure Habits Subgroup have draft of paper on prospective doses for the November 2008 NDAWG meeting. *Completed*

Action 13.7 David Webbe-Wood to draft a note for the minutes about the local planning process. *Completed*

Action 13.8 Relevant organisations to let Paul Dale and the NDAWG secretary know their representatives for the Heterogeneous Contamination Subgroup. *Completed*

Action 13.9 Paul Dale to arrange a meeting of the Heterogeneous Contamination Subgroup and for the Subgroup to inform NDAWG of what it going to be included in the Subgroup guidance in the November main NDAWG meeting. *Partially completed*

Action 13.10 the secretary to circulate the HPA response document to the ICRP. *Completed*

Action 13.11 the secretariat to review material in the research database to ensure that it only includes research. *Completed*

Matters arising

None were raised that were not dealt with as specific agenda items.

3 Plans for future guidance documents (Paper 14-02)

The first two guidance notes are now published and the third is on the web for comment, although no comments have been received so far. Draft guidance notes on direct radiation, and variability and uncertainty had been prepared by Patrick Stephen and David Webbe-Wood, respectively, both of whom gave a brief overview of these notes at this meeting.

Following Patrick's presentation a discussion was held by members on the contents of the direct radiation guidance note. John Hunt commented that the method described in the guidance note was essentially that of profiling as it considered the simple addition of data. It should be stated that this is a simplification.

Action 14.1 Patrick to add wording to the direct radiation guidance note that summing doses from direct radiation and other pathways is a simplification

Members felt that that the guidance as it stands now would not be very useful to new sites that had no previous survey data. It was also felt that more information was required on how background dose rates should be handled, including the setting of a suitable background and how it should be used with measurements of direct radiation to avoid double counting. Following on from this a discussion on measurement versus modelling was held, including how to measure the direct radiation contribution when background could comprise most of the measured dose rate. It was felt that having a statement saying that if getting a measurable direct radiation measurement was difficult in that it was difficult to separate it from background then it was most likely not significant. Members felt that a value of a few tens of microSieverts per year above background would be a suitable definition of this.

It was noted that there maybe an inconsistency in the way critical groups are defined in that for direct radiation an identifiable location was used whilst for other pathways hypothetical intake rates would be used. The use of candidate critical groups should therefore be considered in that many critical group locations and habits would be assessed and the most restrictive of all of these would be the critical group for the site. John Titley noted that this would be considered for future EA assessments. Members felt that the document should contain guidance on selecting critical groups for direct radiation although reference to the NDAWG principles document should be made for general guidance on critical groups.

Minor editorial comments were suggested by members and Patrick suggested that any further comments should be sent to him for adding to the guidance document by the 12th December 2008.

Patrick hoped that at the next meeting this guidance note could be signed off and placed on the NDAWG web site.

David Webbe-Wood gave a presentation on the variability and uncertainty guidance note that was based on reports made by the Uncertainty and Variability in Dose Assessments Subgroup of NDAWG. Ian Fairlie noted that there were no references to the CERRIE report dealing with this topic. Members agreed that such a reference should be added.

Action 14.2 David Webbe-Wood to include reference to the work of CERRIE in the uncertainties guidance report.

Ian Fairlie asked whether the bullet points in the definition section could have relative values to guide people, even if it was just order of magnitudes. David replied saying that this would not be practical as these would be site specific. Mike Thorne noted that these points were important as they acted as prompts for people doing assessments as many of these areas of uncertainty are often left out. Jim Smith asked whether anything could be added on testing uncertainties in modelling as often the uncertainties in a model are known but that this is rarely tested. Jane Simmonds noted that this was not suitable for this guidance note but would be considered in the guidance on modelling.

Mike Thorne suggested that a general comment should be present within the document on when to seek expert advice, as it would often be beyond a general practitioner's understanding or ability to be able to carry out a full uncertainty analysis.

Action 14.3 David Webbe-Wood to add a general comment about seeking professional advice on uncertainty to the guidance note.

John Tittle asked whether guidance should also be given on how to include estimated values into an assessment, for example, how to select a distribution profile. Members thought that this should be given.

Minor editorial comments were suggested by members and David suggested that any further comments should be sent to him for adding to the guidance document by the 12th December 2008.

Jane Simmonds presented an outline of the guidance note on environmental modelling, which had been agreed by the Steering Group. It was felt that developing this guidance would need a small drafting group. Jane said that she would head this group and that the EA and FSA have offered to help. Steve Jones offered to act as a reviewer.

Rob Allot raised a general concern over what the guidance notes were trying to do. For example, a lot of the notes are complicated and could be simplified although this may take the detail out of them. He suggested that a "covering" note introducing the guidance could be added for those concerned with simple cases and the detail left to an appendix for those wishing to look at more detailed cases. It was suggested that some targeted testing of the guidance notes should be performed. John Cooper agreed although noting that this could only be done when several notes had been prepared so that the level of detail in each of them could be compared. He suggested that by the next meeting members think about how this road testing could be done, perhaps identifying projects/individuals that could perform this task. Peter Marsden was also concerned that some of the terminology used in the guidance notes could make them inaccessible to small users.

Action 14.4 Steering group to prepare a note for the next meeting on how to road test the guidance notes, covering what they thought would be the minimum number of notes that would be required and a possible range of users (large and small users) to test it on.

Action 14.5 Authors of the guidance notes to review their notes to see if additional information should be added reflecting small user premises.

Action 14.6 Peter Marsden to review the notes and pass them onto the Small Users Liaison Group for their comments and pass any comments back to the authors.

Action 14.7 Peter Marsden to ask the Small User Liaison Group if they wished to see guidance on any other topics.

Action 14.8 All members to send any comments on the guidance notes to the authors by 12th December.

4 The contaminated land exposure assessment model (paper 14-03)

James Penfold presented a paper describing the process of developing the RCLEA model, the model itself, and its application.

Steve Jones asked how radon was included within the contaminated land regime and the models. James stated that radon was controlled under its own regime and that RCLEA was created to support assessments made under the contaminated land regulations and therefore did not include it. Mike Thorne noted that members of natural decay chains are included within the model and asked whether there was a possibility that users would include background levels of these radionuclides within an assessment given that they are often reported as part of general surveys? James thought that this was possible and that only good documentation of the model and training of users would prevent the inclusion in an assessment of background radionuclides. Rob Allot noted that the fetus was not one of the age groups included in the model. Jane Simmonds noted that the fetus would only be important for a dose assessment for some short lived radionuclides and that RCLEA considered aged contamination only. The only radionuclide where a potential problem could exist was for ^{226}Ra but in this case other members of the decay chain (^{210}Po and ^{210}Pb for example) would dominate the dose so the overall effect of not including the fetus would be insignificant.

5 Delicensing of Nuclear Licensed sites in relation to Contaminated Land (paper 14-04)

Patrick Stephen presented a paper describing contaminated land issues when delicensing nuclear licensed sites and comparing this process with the new contaminated land regime for non-nuclear sites.

David Webbe-Wood questioned the application of the “no danger” criteria to small users in operation today. Patrick stated that the “no danger” criteria would not apply as that was aimed at sites operating with a nuclear site license but that the IRR99 and RSA93 would apply which contained regulations dealing with wastes and other material on site that the operator would have to deal with before an authorisation could be revoked. It was noted that there was no guidance from EA on this matter although members thought that any material left on site would be compared against the SoLA (substance of low activity) exemption order to determine if an authorisation could be revoked.

For nuclear licensed sites Patrick noted that the HSE would consider all reasonably foreseeable future developments of the site in its risk assessment. If a future use could not be dismissed then it would be compared against the 10 μSv per year target regardless of probability of occurring.

Steve Jones noted that ICRP also recommends a risk criterion of 10^{-5} per year for waste disposal. And this means that an additional set of criteria existed for waste disposal to near surface sites (eg for VLLW landfill) compared with contaminated land.

John Cooper noted that the presentations demonstrated to this meeting why there were differences in the approach used for delicensing nuclear licensed sites and for contaminated land, the 10 μSv per year and 3 mSv per year criteria respectively, as one is intended for a planned use of the site whilst the other is for an existing situation. He asked members

whether NDAWG should do anything in this area. Jane Simmonds noted that SAFEGROUNDS were the main source of guidance in this area and if NDAWG started to get involved then there was a risk of duplication of effort. James Penfold stated that SAFEGROUNDS were presently preparing a paper on the dose assessment of radioactively contaminated land and suggested that NDAWG could review this. It was noted that Shelly Mobbs (HPA) was currently on the SAFEGROUNDS steering committee and could provide material to NDAWG if asked.

Action 14.9 Jane to ask Shelly Mobbs to send relevant material that SAFEGROUNDS had prepared on assessing doses from radioactively contaminated land to NDAWG members for information.

6 Modelling the bio-accumulation of ^{32}P and ^{33}P in freshwater systems (paper 14-05)

Jim Smith presented a paper describing results of the modelling of radioactive phosphorus in river systems in particular regarding the concentration of these radionuclides in fish. Concentration factors for these radionuclides have historically been derived by the use of stable versions and radioactive decay significantly decreases the concentrations of these radioactive forms in the higher trophic levels of river ecosystems, relating directly to fish that humans eat.

Mike Thorne noted that there is an increasing use of models to calculate concentration factors that include radioactive decay and it would be worth while for NDAWG to keep an eye on this area. He also noted that Jim's model did not include downstream movement of radionuclides which would also decrease the concentration in fish close to the point of release. Jim noted that this would be the case although this would be very difficult to model generically and the current approach was deemed to be cautious and yet more realistic than previous methods. John Hunt asked if any model validation had been performed. Jim replied that he hoped that in the future some validation could be performed although this is not easy given the often pulsed nature of discharges making it hard to get reliable measurements over a period of time.

Mike Thorne thought that in future additional guidance should be given on how to use these data i.e. how to refine an assessment from a scoping calculation using established concentration factors to using site-derived factors from Jim's report. Jill Sutcliffe asked whether the phosphorous content of upland rivers is similar to lowland rivers. Jim noted that the stable phosphorous content of the water would generally be lower in upland rivers as lowland rivers pick up phosphorous from farmland runoff. Consequently the concentration factor would be higher. John Titley noted that the EA collects information regarding the elemental content of river water although this is not currently published. He could provide this information if members produced a list of river names where such information would be useful, as not all rivers in the UK had discharges to them and this would cut down on the amount of collation effort involved.

Laurence Austin asked if members thought this issue of over estimating concentration factors is a general issue for relatively short lived radionuclides. Does NDAWG need to issue guidance on this such as when half-life of a radionuclide could become important when determining concentrations? Mike Thorne also noted that factors that affected stable phosphorous concentrations also needed to be considered i.e. changes in farming practices over a period of a few years.

John Cooper thanked the EA for sponsoring this work. He suggested that the work be formally submitted for publication in a peer reviewed journal. John concluded that this topic was completed to NDAWG's satisfaction and thanked Jim for his work.

7 Report back from Subgroup on Habits Data (Papers 14-06 and 14-07) (Mike Thorne)

A draft habits report had been prepared and sent round members for comments. John asked that any final comments to be sent to Mike by the 12th December 2008.

Action 14.10 Members to send comments to Mike Thorne regarding the Habit Report by the 12th December 2008.

Rob Allott asked whether the proposed methodology for prospective assessments meets the Principles Document in terms of retaining sufficient caution, since it is reliant on actual habits from the last habit survey. Some habit surveys are more than say 10 years old. Mike replied that assessments usually included sufficient caution that data of this age should be acceptable, although it is up to the assessor to review such data to determine if anything obvious had changed (a new food being eaten for example rather than just the amount of food). Rob Allot also noted that the report implied that there are differences between the use of habits data between nuclear licensed sites and other (small) users. All present agreed that in principle the same criteria should apply to all users of radioactivity, although Peter Marsden stressed that consideration should be given to what small users could be practically expected to do given their often limited budgets. Members felt that if differences did exist between small users and nuclear licensed sites then this needs to be explained carefully and ideally the text should be changed so that the same guidance is given to all users of radioactivity. The use of one flow diagram in the report should be considered. Rob wondered whether another option could be considered which was to use profiled generic UK habit data. This could be used by non-nuclear and nuclear sites. Where habit surveys are undertaken, mainly for retrospective dose assessments due to historical discharges, then it would be appropriate to use this habit data for prospective assessments.

Action 14.11 Mike Thorne (as chair of the Habits Subgroup) to propose a new flow chart for use by all dischargers of radioactivity by the end of January 2009.

Mike Thorne noted that in the flow chart "other considerations" was used as a catch all so that site-specific features could be taken into account. He felt that this required a bit more explanation. John Titley noted that small users routinely use the methodology given in NRPB-W63. This is not currently included in the Habits Report and it should be for completeness. For new sites where there are few previous habit data available from surveys members noted that that a generic assessment could be carried out using data from national surveys and if this indicated that the doses are low then the absence of site specific data would not be a problem. Refinement of the assessment should be done in stages with a habits survey only being carried out as a last resort.

8 Report back from Short Duration Releases Subgroup (Papers 14-08, 14-09) (Rob Allot)

Rob outlined the Subgroup's draft report dealing with short term release to rivers. Members agreed that NDAWG would accept this report, subject to any further minor editorial changes. A future report will describe short term releases to atmosphere and this should be ready by the next main NDAWG meeting.

Action 14.12 Members to send any final comments on the short duration releases (rivers) report to Rob Allot by the 12th December 2008.

Members asked that information relating to the removal of radionuclides during drinking water preparation be added to the list of future topics to be considered by NDAWG.

Action 14.13 Secretariat to add guidance on radionuclide removal efficiency during drinking water preparation as a future topic.

9 Report back from Subgroup on Communications (Paper 14-10) (Stuart Conney)

In Barrie Lambert's absence, Stuart updated members on the work of the Subgroup. Following the workshop on communications held in February 2008 there are plans for future workshops focussing on communication aspects of emergency response scenarios in February 2009 and on the communication of uncertainty in May 2009, noting that the latter workshop is still in doubt unless sufficient funding becomes available. Stuart asked for any potential funders to contact him or Barrie.

Stuart reported that the communications leaflet is nearing completion. Wayne told members that a final draft is in preparation at HPA and should be sent to members of the Communications Subgroup for final comment within the next few weeks.

10 Report back from Subgroup on Heterogeneous Contamination (Paper 14-11)

In Paul Dale's absence, Steve Jones told members that a meeting of this Subgroup had taken place and that it is in its early stages of formulating its work plan. A lot of discussion at the first meeting was about what constituted "heterogeneous" contamination and it was decided that the Subgroup would focus its attention on very heterogeneous contamination.

Mike Thorne noted that the group was considering that the GI tract could be taken to be the same as skin for deterministic effects after ingestion. This would require a lot of assumptions to be made regarding the deterministic dose levels and tissues at risk for these two organs.

11 Report back from members

John Cooper gave a report on the HPA response to the new ICRP recommendations. He noted that the consultation period had just closed. The intention is that the proposed HPA response will be put to the HPA Board early next year. John noted that many of the comments received were on the proposed dose constraint of 150 μSv for new nuclear power stations and whether this should be extended to other new sources. John noted that this was only for new sources and not current/old discharges as it was felt that for example, the new generation of nuclear power stations could easily meet the 300 μSv dose constraint so in the interests of optimisation a lower constraint could be set. This could be seen as a case specific constraint and members agreed that dose constraints should not be a case of "one size fits all".

Sue Nowak (DECC) updated members on the current Defra consultations on the discharge strategy and the statutory guidance to EA. She reported that the consultations had now closed and that not many comments had been received. She noted that most of the comments were on the proposed change of the dose target of 20 μSv to 10 μSv . Members agreed that there was no real difference between these values but they also noted that there was not much information as to why the value was being changed. Sue noted that Defra will publish their response to the consultation in December 2008. They intend to move ahead with the statutory guidance document as fast as possible but Sue told members that

meetings were still being held to discuss the discharge strategy so this report may be delayed. Sue noted that at these meetings no small user representative was present and asked that if anyone wanted to be involved then they should contact Martin Hum. It is hoped that these will be published around April/May 2009.

Patrick Stephen informed members about the revision of the EC and IAEA BSS and on new build. On new build Patrick noted that stage 2 (design safety overview) had been completed and that all 4 designs submitted had passed. Stage 3, the detailed assessment, was completed in June 2008. He noted that the AECL design had been withdrawn and that GE Hitachi had requested a suspension to the assessment work on its design. The NII sitting policy review had agreed to use a generic assessment which will include a semi-urban environment. In August 2008 the HSE published its step by step guide to applying for a site license. On the BSS update Patrick reported that the EC BSS draft was aiming to be completed by November 2009. The IAEA is intending to get its draft BSS to member countries during the autumn of 2008 although this is thought to be unlikely to occur on this timescale. The implementation of a new BSS will eventually lead to a revision of the IRR.

David Webbe-Wood noted that the first meeting of EMRAS II will be held in January 2009 on model inter-comparison. David feels that this organisation could be similar to NDAWG just with an international slant to it. The FSA representative will report on this at the next NDAWG meeting.

Jill Sutcliffe noted that she was looking at the interface between scientists and the users of scientific information (local authorities etc). She asked that anyone with experience of this should contact her.

Steve Chandler told members that following changes in the machinery of Government all radioactive waste policy work has moved into the new Department of Energy and Climate Change (DECC). Work on CBRN will stay at Defra.

Steve Chandler also reported on the development of the Environmental Permitting Regulations which will have the RSA incorporated within them (England and Wales). Consultation on this will be carried out next year. A review of Exemption Orders is also under way and the intention at present is to have only 1 or 2 replacing the 18 currently in existence.

12 NDAWG review (Paper 14-12)

NDAWG Terms of Reference – No changes were proposed and members agreed that we were meeting them.

Future work programme – members were happy with the proposed future work program.

Research database – Jane Simmonds commented that the database in its current form was becoming hard to keep up to date as up to date information was not provided on a regular basis. The steering group had discussed this issue and had proposed that the database could be replaced with an annual report reviewing completed work. However, it was noted that this still relied on information being passed to the secretariat and that this would place a lot of effort on the secretariat to complete. Members agreed that the annual report seemed the best way to keep the information up to date. The first report will aim to include all the information in the current database so that it is not lost and subsequent reports will include new projects that had been completed in that year. Proposed work will be highlighted using links to the relevant web sites (EA, Defra etc). This will be added as an agenda item to future main meetings. Jane agreed that she would prepare a paper describing the options on how the annual report would work and how to take this forward.

In particular, there was a discussion of what constitutes research in relation to the removal of an entry from the database.

Action 14.14 Secretariat to add the annual research report as an agenda item and Jane Simmonds to prepare a paper describing how to take the annual research report forward by the next main meeting.

Ian Fairlie asked that his paper on RBE and w_R values of Auger emitters and low-range beta emitters be restored to the database.

NDAWG website - Between April 2008 and October 2008 there were 7239 visits to the NDAWG website (over 1034 visits on average a month) with people accessing over 71,000 files. There seemed to be little change over the year. The relatively, large number of hits in July and August were due to possible use of "NDAWG" in a forum handle.

13 Any other business

Ian Fairlie asked whether the results of a German study into cancer clusters around power stations should be reviewed. John Cooper replied that this was a risk-based assessment which was outside the remit of NDAWG and which came under the remit of COMARE. Jill Sutcliffe asked if a member of COMARE should be invited to NDAWG to give a presentation on risks and what COMARE are doing in general. Mike Thorne suggested that considering risks would be easier to do if NDAWG had specific topics in mind i.e. areas of risk based work where NDAWG is getting involved (heterogeneous contamination for example).

Action 14.15 Jane to ask the NDAWG steering group to consider whether a member of COMARE should be invited to a meeting to give a presentation on risks

The chairman thanked the speakers and Steve Chandler and Defra colleagues for organising the meeting, providing lunch etc.

14 Date of next meeting

The 15th NDAWG meeting will take place at FSA on the 23rd April 2009.

15 Summary of Actions

Action 13.5 Matthew Castle to send John Titley information on how industry uses habit data which will be included in the paper on prospective dose assessments. *On going John Titley had sent Mathew reminders about this but had yet to receive the required information. Action moved from Matthew Castle to Laurence Austin.*

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NDAWG Secretariat 17 December, 2008