NDAWG
National Dose Assessment Working Group

NDAWG GUIDANCE NOTE 1

Overview of guidance on the assessment of radiation doses from routine discharges of radionuclides to the environment.

The National Dose Assessment Working Group (NDAWG) aims to promote the use of best practice and consistent methodologies for assessing radiation doses from planned discharges of radionuclides to the environment. As part of its work, NDAWG publishes reports on key topics on its website (www.ndawg.org). In addition NDAWG is planning to publish a series of consolidated guidance notes on key issues related to dose assessment. This first note is intended to give an overview of the hierarchy of guidance from NDAWG and to summarise recommendations on the overall approach to dose assessment. This guidance is concerned with both prospective and retrospective assessment of radiation doses to the public from planned discharges of radioactive material to atmosphere, sewers or water bodies. Prospective assessments form an important input into the authorisation process while retrospective assessments are used to demonstrate compliance with the public dose limit.

Hierarchy of NDAWG documents

1. Principles Documents

The key document for prospective assessments is the 'Principles for the assessment of prospective public doses'[1]. This document gives a set of principles and provides guidance on the assessment of public doses for the purpose of authorising discharges of radioactive waste to the environment. The topics considered include: the regulatory framework, radiological protection criteria, general dose assessment principles, an overview of the dose assessment process, the initial source assessment, detailed source and site assessments, short term releases, collective doses plus uncertainty and variability assessment.

For retrospective assessments the key document is an NDAWG report, 'Principles for the assessment of total retrospective public doses'[2]. The scope of the document is the assessment of total retrospective doses from authorised discharges of radioactivity into the environment and regulated direct radiation for comparison with the dose limit. The topics considered are the requirements for reporting such doses, the population groups to be included, sources and exposure pathways, realistic assumptions, monitoring versus modelling, critical groups and their habits, collective dose assessment, variability and uncertainty.

2. Guidance notes

The series of NDAWG guidance notes is intended to give practical guidance on specific aspects of the assessment of radiation doses covered by the principles document. The aim is to provide short overviews to encourage harmonisation

and consistency in dose assessments. There will be full consultation with NDAWG members, by NDAWG members with their parent organisations and more widely with interested parties before the guidance notes are published. The notes will be published on the NDAWG website but NDAWG will also consider ways of making them more widely known, for example through publication in a relevant journal. The guidance notes will draw on work carried out by NDAWG and its sub-groups together with any other relevant inputs from members and their organisations. Reference will be made as appropriate to more detailed information and discussion of key issues.

Guidance notes on the following topics are planned initially: Initial assessment tools; Exposure Pathways; Direct radiation doses; Habits data; Environmental modelling; Detailed dose assessment; Short duration releases; Assessment of collective doses; Variability and uncertainty.

3. NDAWG reports

NDAWG publishes a series of reports on its website dealing with various topics relating to the assessment of radiation doses from controlled releases. Many of these reports will form the basis for the guidance being produced and will be a source of reference. In particular, the reports are likely to give more background information and discussion relating to NDAWG guidance. The reports are available from the NDAWG website (http://www.ndawg.org/NDAWGpapers.htm).

NDAWG guidance on the overall approach to prospective dose assessment

- Dose assessments for use in the authorisation of discharges of radioactive wastes to the environment should follow the 'Principles for the assessment of prospective public doses'[1].

- When applications for new or revised authorisations are received from key nuclear sites the Food Standards Agency and the relevant Environment Agency should agree on key inputs to the assessment. For example, they should agree on the radionuclides composition of the release, effective stack heights for releases to atmosphere, the location of possible critical groups and relevant habit data. This information should also be supplied to the site operator.

- All dose assessments should be clear and transparent. This means that the description of the assessment should be sufficiently detailed that a third party can reproduce the estimated doses if required. All of the data used in the dose assessment should be provided together with a description of the methodology used. In assessing doses various computer models may be used to predict the transfer of radionuclides through different parts of the environment. It is not necessary for a full description of each model and associated input parameters to be provided. However, the models used should be clearly referenced and the model results used in the dose assessment should be given. For example, the activity concentrations in air per unit discharge to atmosphere, or the activity concentrations in a particular food per unit deposition on the ground.

- It is recognised that the need for transparency could cause difficulties if it lead to specific individuals being identified. The habit data used in site specific dose assessments is produced in a report that does not contain information that could identify individuals and this should normally be sufficient to ensure that a third party can reproduce the estimated doses.

- It is acceptable to carry out a simple cautious assessment of critical group doses but only if the assessed annual dose is less than 0.02 mSv. If doses are higher than this then a detailed and more realistic dose assessment should be carried out together with a review of how much caution has been applied at each stage of the assessment.

NDAWG Guidance on the overall approach to retrospective total dose assessment

- Dose assessments to show compliance with the public dose assessment should follow the 'Principles for the assessment of total retrospective public doses'[2].

- Total retrospective dose assessment methods and data should be transparent. The methods and underpinning data should be made publicly available in a suitable form that another party can repeat the dose assessment (see comments made above for prospective dose assessments).

- All significant sources of authorised historical and current radioactive waste discharges should be considered together with direct radiation from sources subject to control. The dose assessment should consider all relevant exposure pathways and the total dose should be compared with the dose limit for members of the public.

- There is a requirement for such dose assessments to be as realistic as possible[2]. Assessments can be made more realistic through the use of site specific data, such as monitoring or habit data. However, it is acceptable to carry out a simple, more cautious assessment provided that the estimated total critical group dose does not exceed 0.02 mSv/y. As for prospective dose assessment above this dose a more detailed and realistic assessment should be carried out together with a review of the uncertainty and variability in the key assumptions.

Relevant NDAWG Reports

NDAWG/1/2004 Use of measurements in assessing doses to the public: a discussion paper. Steve Jones

NDAWG/2/2004 Radiological Assessment Exposure Pathways checklist (Common and Unusual) Rob Allott

NDAWG/1/2005 An Overview of Uncertainty in Radiological Assessments. National Dose Assessment Working Group: Subgroup on Uncertainty and Variability

NDAWG/2/2005 Assessment of Compliance with the Public Dose Limit Principles for the Assessment of Total Retrospective Public Doses. Rob Allott

NDAWG/3/2005 Methods for Assessment of Total Dose in the Radioactivity in Food and the Environment Report. Bill Camplin, Marcus Grzechnik and Carol Smedley

NDAWG/4/2005 Position paper on the collection and use of habits data for retrospective dose assessments. Subgroup on Habit Data and Critical Groups

NDAWG/1/2006 Reviewing non nuclear licensed site radiation dose assessments taking into account uncertainty Sub Group on Uncertainty and Variability

NDAWG/2/2006 Overview of Radiological Assessment Models - Key Gaps and Uncertainties (Version 2) NDAWG Modelling Sub-group

References

1. The Environment Agency (EA), Scottish Environment Protection Agency (SEPA), Department of Environment, Northern Ireland (DoE, NI), the National Radiological Protection Board (NRPB, now the Radiation Protection Division of the Health Protection Agency (HPA-RPD) and the Food Standards Agency (FSA). Authorisation of discharges of radioactive waste to the environment Principles for the assessment of prospective public doses. Interim Guidance, December 2002. http://publications.environment-agency.gov.uk/epages/eapublications.storefront/47a83bdc0165566e273fc0a8029606a4/Search/Run

2. Allott R, Assessment of compliance with the public dose limit. Principles for the assessment of total retrospective public doses. NDAWG/2/2005 http://www.ndawg.org/NDAWGpapers.htm

Guidance note agreed May 2008 following consultation.

About NDAWG Guidance Notes

National Dose Assessment Working Group Guidance Notes provide guidance on radiological assessment topics. The UK NDAWG has representatives from Government and its Agencies, nuclear industry, non-nuclear users of radioactive substances, Non-Governmental Organisations and independent experts. The guidance notes are approved by at NDAWG meetings and have been consulted upon for a period of 3 months via the NDAWG website (www.ndawg.org).