

## Summary of PROTECT WP1 Questionnaires

The following is a summary of PROTECT questionnaire responses from regulators, advisory bodies and industry received to date (23/03/07). Much of the following is comprised of 'quotes' from the returned questionnaires with little interpretation/comment on the replies by the PROTECT consortium at this initial stage (quotes are identified by italics). We anticipate that we will be able to accept additional completed questionnaires until 01/08/07. We will interact with respondents to expand upon responses as required in working towards the preparation of our report: 'A review of approaches to protection of the environment from chemicals and ionising radiation - requirements and recommendations for a common framework'.

### Nature of Questionnaire Respondents

Total of questionnaire returns to date is 34.

Of the returned questionnaires 44% were from regulators, 20% were from advisory bodies, 12% were from NGOs or international organisations and 24% were from industry.

In terms of geography, responses from within Europe came from:

Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Norway, Romania, Spain, Sweden, Switzerland and UK.

Worldwide responses came from: Australia, Canada and 3 international organisations.

Of the regulators who answered the questionnaire 60% stated that they regulate to protect the ENVIRONMENT (as well as humans) from ionising radiation. However, further clarification is needed, respondents may have answered yes in accordance with the ICRP statement 'protecting man will protect the environment'.

### What are the Protection Goals of the Questionnaire Participants

For radioactivity, the main cited protection goal was the protection of human health and the environment. Clear environmental protection goals, for example, requirements within legislation were mainly to 'protect the environment' or 'protect ecosystems'. Indeed, one respondent stated that *'there is a need to describe the goals in more precise, concrete terms.'* The full range of interpretations of protection goals were:

- protection of ecosystems
- protection of biodiversity
- pollution prevention
- sustainable development
- unreasonable risk to biota
- specific species at an individual level – all at a population level
- favourable conservation status
  - maintenance of habitats with reasonable populations of species
  - sites protecting rare species of low population
- damage and nuisance irrespective of whether these are caused by pollution or other influences
- protection of animals, plants and the biological diversity on a qualitative basis
- ecosystem structure and functioning

- the aquatic environment

For comparison, chemical environmental protection goals were been cited as:

- protection of ecosystem function rather than specific species
- identify acceptable or unacceptable risks
- surface waters (fresh and marine), sediment, waste water treatment plants, soil, atmosphere, secondary poisoning and PBT assessment (the latter aims to pick up those chemicals that would always be of concern and pose long-term risk).

One response (UK regulator) noted that *'The Radioactive Substances Act and its provisions in the UK differs from other legislation because it does not start from the premise of Environmental Quality Standards'*.

### **Relevance & Achievability of these**

*'Perfectly relevant concerning the human radioprotection aspect with clear target and criteria. Implicit for the protection of the environment concerning the radioactive substances while explicit for chemicals (compliance is checked for a number of quality criteria)'*

### **Criteria**

67% of regulators thought that the criteria used is suitably conservative; 6% said that they could not say; and 27% of regulators did not answer the question. When the same question was asked of industry 75% said they thought the criteria was suitably conservative and 25% said they could not say with one respondent stating that *'this question should not to be addressed to an industry.'*

For chemicals it was stated that *'work has indicated the standards in relation to disposal of sewage sludge to land are not protective. For other standards there are suspicions in both directions but evidence to prove it is difficult.'*

46% of regulators also use qualitative endpoints, as do 63% of industry. The main one cited was ecological surveillance.

For the chemical industry, an example of a qualitative endpoint was given as *'discharge shall contain no visible oil or grease.'*

87% of regulators said that stakeholders should be included in decision making or criteria setting, though one respondent went on to specify *'yes along as the stakeholders were part of the scientific community on radiation protection'*. The remaining 13% of regulators did not answer the question. 75% of industry said that stakeholders should be involved.

For chemicals regulation the following was stated:

*'To date stakeholders have been involved to a limited extent with most involvement being through a consultation process once the numeric criteria have been derived. Current thought it is that there should be greater involvement and in earlier parts of the process, e.g. defining protection goals. One approach being discussed is the use of Multi Criteria Decision Analysis (MCDA)'*

The number of regulators willing to revise criteria in the light of new work was 93% (with 7% not stating either way). When the industry respondents were asked *'do you undertake research related to standards in order to challenge the regulators?'* 25%

responded that they carried out their own research to help inform (not challenge) the regulators.

### **Envisaged Changes to Future Regulation of Radioactivity with Respect to the Environment**

In terms of changes to future regulations the main comments included:

- No change was envisaged by a number of respondents (one respondent specifying that for repositories specifically – *the legislation and drivers for the repository are quite clear at present and so no particular future changes are envisaged*)
- Specific consideration of non-human species
- Lowering of current protection criteria. Driven by public interest and following along current and developing approaches to protection of environment from non-radiological chemicals
- Influence of REACH (key change), Water Framework Directive, Integrated pollution prevention & control. A question was raised about the impact of the Water Framework Directive on ionising radiation discharges. *‘The WFD was never intended to focus on ionising radioactive wastes as no radionuclide is on the WFD lists however, ionising radiation could be classified under the list entitled ‘other pollutants’ to be dealt with in 2015’*
- *The current trend of prioritising environmental protection is likely to continue whilst countries are debating or planning new nuclear power stations. However, this could lead to a decrease in priority (of environmental protection from ionising radiation) if there are increased concerns over global warming and security of energy supply.*
- In some replies immediate changes are not envisaged, but if changes happen then the drivers would be European Directives and International Conventions and revision of IAEA/EC Basic Safety Standards
- Detailed regulation with numerical limits will probably increase as EU directives are produced and implemented in some countries (e.g. Sweden). It was noted that detailed legislation is not always very compatible with the more general environmental code
- Increase in the number and use of environmental quality standards
- Dependant on projects like PROTECT
- *Additional legislation for natural ecosystems*

### **Radionuclide Regulation Compared to Chemical Regulation**

Many of those who participated in the questionnaire did not answer this section.

When completed, the section was often answered in a general sense, with varied responses including:

#### Similarities & Differences

A basic difference was noted as the fact that chemical legislation is harmonised in EU and the EEA area (whereas environmental protection from ionising radiation is currently not)

- In Norway, for example, the regulations relating to pollution are applied to non-radioactive chemicals only, with environmental protection constituting a central

focus. These regulations are more detailed than those existing for radioactivity where the main focus is human health.

- In Germany only regulations for chemicals are in force
- Some organisations did not feel qualified to answer such a question and expressed that until now all the regulations regarding chemical contamination expressly excluded radioactive substances
- Some felt that there were no differences between chemical and radioactive substances and that the distinction was historic
- Some felt there were no differences i.e. both are based on a certain threshold or dose
- *Concerning human health and demonstration through environmental impact assessment, criteria used are more stringent for radionuclides (but achieved easily) than they are for chemicals*
- *Chemical Regulation has its basis on protecting the environment from negative impacts and is now only beginning to consider the environmental effects of low levels of such chemicals on man. The effects of radioactivity for man are well quantified but the effects on the environment is less well understood*

#### Environmental Protection Endpoints

- It was often believed that risk assessment was more developed for radiation compared to chemicals
- *Endpoints for biota (from both chemicals and radioactive substances) are considered to be quite clear (and similar). However, for humans they are different and this is considered an important mismatch*
- *Guidance for ecological risk assessment of chemicals is still under development. There are unresolved issues over carcinogens and non carcinogens and over mixtures of chemicals. For radionuclides, however, the regulation is more developed and additivity of radionuclides is more straight forward*

#### Criteria Setting & Extrapolation

- Some said there is nothing to compare against for biota but it is considered to be worse for chemicals than for radionuclides
- One respondent cited that '*regulatory standards for radioactive substances should afford equivalent protection to the environment as standards for chemicals*' and another respondent stated that '*protection should be uniform regardless of industry type.*'

#### Where one area of regulation can learn from another

- The long-term effects from exposures to chemicals were often thought not as well known as the long-term effects of radiation
- Flexible goal setting regulatory approach in chemical regulation which could be used in radiation

A number of respondents noted that there is a lot of interest from the radioactive field on what is happening in the chemical field but not vice-versa

**Organisations who have completed questionnaires**

<b>Organisation</b>	<b>Acronym</b>	<b>Country</b>
Australian Nuclear Science & Technology Organisation	ANSTO	Australia
AREVA	AREVA	France
Autorite de Surete Nucleaire (French Nuclear Safety Authority)	ASN	France
Bundesamt fuer Strahlenschutz (Federal Office for Radiation Protection)	BFS	Germany
Canadian Nuclear Safety Commission	CNSC	Canada
Commissariat à l'Énergie Atomique	CEA	France
County Administrative Board of Västmanland		Sweden
National Research Centre for Energy, Environment and Technology	CIEMAT	Spain
Conejo de Seguridad Nuclear	CSN	Spain
Devonport Royal Dockyard Limited		UK
Electricite de France-CIDEN (Centre d'Ingenierie de la Deconstruction et de l'Environnement)	EDF	France
Environment Agency for England & Wales	EA	UK
Greenpeace International		International
Institute for European Environment Policy	IIEP	European
Instituto Superiore Sanita (National Institute of Health)		Italy
Institut de Radioprotection et de Surete Nucleaire	IRSN	France
Swedish NGO Office for Nuclear waste Review/The Swedish Society for Nature Conservation	MKG/SNF	Sweden
Miljöoverdomstolen (The Environmental Court Of Appeal)		Sweden
National Commission For Nuclear Activities Control		
Nationale Genossenschaft Fur die Lagerung radioaktiver Abfalle	NAGRA	Switzerland
National Commission for Nuclear Activities Control		Romania
Nexia Solutions Ltd (formerly known as BNFL R&D department soon to be the National Nuclear Laboratory)		UK
Norwegian Pollution Control Authority		Norway
Norwegian Radiation Protection Authority	NRPA	Norway
Nuclear Decommissioning Authority	NDA	UK
OECD Nuclear Energy Agency		International
Posiva Oy		Finland
Radiological Protection Institute of Ireland	RPII	Ireland
Riso National Laboratory		Denmark
Studiecentrum voor Kernenergie - Centre d'étude de l'Énergie Nucléaire (Belgian Nuclear Research Centre)	SCK-CEN	Belgium
Scottish Environment Protection Agency	SEPA	UK
Scottish Executive		UK
Swedish Chemicals Agency	KEMI	Sweden
Radiation and Nuclear Safety Authority of Finland	STUK	Finland