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## **European ALARA Network (EAN)**

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### **Final report (summary)**

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## **Introduction**

In Directive 96/29/Euratom, the optimisation principle (ALARA) was re-emphasised as the cornerstone of the radiological protection system. Throughout the 1980s and early 1990s ALARA was integrated into many organisations' radiation protection programmes, particularly in the nuclear industry. However there was still much to be done for ensuring better protection of workers from ionising radiation throughout the Member States, applicant and associated countries, in the medical sector, in the non-nuclear industry, particularly in the naturally occurring radioactive materials (NORM) sector, as well as for the management of internal exposure in general.

Therefore, as an extension of previously funded work on this subject (EC joint research projects on "Optimisation of radiation protection" from 1983 to 1989 and European courses on "Optimisation of radiological protection in the design and operation of nuclear facilities") the EC considered it worthwhile to create (Fourth Framework Programme – FP4) and support (Fifth Framework Programme – FP5) a European ALARA network (EAN).

At the start of this contract, EAN consisted of fourteen national partner organisations, as listed at the end of this report. By the end of the period, EAN had expanded to include representatives of institutions from eighteen European countries (Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom) belonging to the industry, research centres or national regulatory bodies that participated to the management of the network.

## **Objectives**

The main objective of the network is to carry on promoting the efficient and effective application of the ALARA principle through European co-operation and ensuring better protection of the workers from ionising radiation throughout the Member States and applicant countries. By bringing together experts from all European countries, the network should provide a focus to identify areas of potential improvement at a European level and to promote a harmonised approach to radiation safety. EAN scope covers a wide range of sectors: nuclear (e.g. nuclear power plants and other installations of the fuel cycle as well as research centres), industrial (e.g. radiography, gauging, accelerators, irradiators, NORM extraction and processing), medical and research centres.

EAN is responsible for initiating and organising scientific European ALARA workshops. These should be a forum to exchange feedback experience, to identify problems that need further research or development, to aid the implementation of ALARA in practice, as well as to provide the different stakeholders, and particularly the European Commission (EC), with recommendations concerning regulatory, managerial, research and development issues.

EAN intended to publish an ALARA newsletter to provide a link between all those concerned with ALARA and to distribute it through various channels, including national contacts, national radiation protection societies and the EC. EAN intended to make use of a website for advertising its activities and disseminating their results.

EAN intended to favour initiatives such as the setting-up of European sub-networks to facilitate feedback exchanges and improve radiological protection practices for different types of facilities such as research reactors.

To summarise, EAN expected to achieve its objectives through:

- Bringing together research teams, manufacturers, managers, workers, local and regional authorities, operators, labour physicists, trade unions, trainers and trainees, occupational physicians and other stakeholders
- Sharing experiences and disseminating expertise (good practices, lessons learned from incidents)
- Developing a co-operation between the EC, Members States and applicant countries
- Creating or strengthening links with international organisations such as IAEA, ILO, IRPA and the national radiation protection societies
- Recommending to the EC practicable solutions in order to improve the radiation protection of workers
- Promoting common strategies and solutions for the radiation protection of workers
- Informing stakeholders about new issues, practices, and regulatory issues
- Comparing national laws and policies dealing with radiation protection, especially those in correspondence with the application of the ALARA principle.

## Results

Since November 2001, three workshops have been organised and have provided recommendations; six newsletters have been issued; two sub-networks have been set up; and the website has been more and more consulted.

The main characteristics of **the three workshops** are described in Table 1. In each workshop there were sessions where the participants were split into working groups tasked with addressing specific issues. The reports from these groups were presented and discussed in the final sessions in order to identify the key findings and recommendations. Therefore these three workshops have led to important sets of recommendations that have been validated by the programme committees, endorsed by the steering committee, made available on the website, and inserted into the EAN Newsletter issues. The targets of these recommendations are summarised in Table 2.

**Table 1: Characteristics of the annual workshops**

Subject	Location and date	Number of participants (deliberately limited to 50-80 persons)	Number of countries
Occupational exposure optimisation in the medical and radio-pharmaceutical sectors	Madrid, Spain, 2002	80	12
Decommissioning and site remediation	Arnhem, the Netherlands, 2003	60	11
Occupational radiological protection control through inspection and self-assessment	Uppsala, Sweden, 2004	70	19

**Table 2: Number of recommendations by types of addressees**

Recommendations to:	National regulation bodies	EC	Utilities	Radiation protection research centres	Manu- facturers	Other int. bodies	Prof. bodies	EAN
Occupational exposure optimisation medical and radio-pharmaceutical sectors	6	5	1	1	2	2	4	1
Decommissioning and site remediation	3	5	3			5		2
Occupational radiological protection control through inspection and self-assessment	8	3	5			2	1	

The same recommendation may be addressed to several different stakeholders. It is therefore not appropriate to add numbers.

Six issues of **the newsletter** (from number 10 to 15) have been published during the period: one every six months. Issues 10, 12 and 14 have provided the recommendations from the fifth workshop on “Industrial radiography improvements in radiological protection”, of the sixth workshop on “Occupational exposure optimisation in the medical field and radio-pharmaceutical industry” and of the seventh workshop on “Decommissioning and site remediation”. The newsletters have also continued describing incidents or accidents and lessons learned. All the newsletters are downloadable from the EAN website: <http://ean.cepn.asso.fr>. These six issues have been downloaded more than 1000 times each. Feedback from different sources indicates that the newsletter reaches several thousand individuals or institutions, mainly in Europe.

**The website** has been regularly updated and visited. In 2001, typically 30 individuals per day accessed the EAN website; since 2002 this has increased to more than 130 individuals per day. Around 200 different documents have been downloaded from the site (mainly

newsletters and workshops presentations). Between five and ten presentations from each workshop have been downloaded more than 400 times and some more than 1000 times. Most visitors come from Europe and North America, but a small percentage comes also from Asia, Oceania and even Africa.

Following the fifth workshop, a **group on industrial radiography** has been set up under the co-leadership of the European Federation of Non-destructive Testing (EFNDT) and NRPB from the UK as EAN representative. This sub-network, in connection with the EC (DG Energy and Transport), aims to develop and maintain codes of practice for NDT operators and NDT clients. The group intends to promote good radiation protection practice and the achievement of ALARA, as well as to develop initiatives to improve and support appropriate radiation protection training, particularly in respect of learning the lessons from accidents and incidents. This group met for the first time in December 2002.

**The European ALARA Sub-network on Research Reactors (EASN)** has been set up in 2002 and started to exchange information on occupational doses and possible improvements in radiological protection. The number of participants to that sub-network has been increasing (five countries in 2002, seven countries in 2003). Data from seven countries are now available. The participants also used the sub-network to promote a process of peer review when visiting each other's facilities.

**Table 3: Topics covered by the EASN meetings**

Topics	Meeting 1	Meeting 2	Meeting 3	Meeting 4
Decommissioning		X	X	X
Status of the regulations		X		X
Management of liquid waste			X	
Training				
Practical implementation of ALARA		X		X
Integrated approach of risks		X		X
Clearance level		X	X	X

## Impacts

In 2003, the steering committee conducted an evaluation of EAN activities. It indicated that many stakeholders have implemented several recommendations from the EAN workshops. The following paragraphs will mainly refer to that evaluation and to more recent events.

The European Commission (DG Research) has supported and financed a research project recommended by EAN, dealing with the management of internal exposure, the SMOPIE project (Strategies and Methods for Optimisation of Internal Exposure of Workers from Industrial Natural Sources) within FP5. This project, co-ordinated by NRG from the Netherlands, was completed in June 2004. The European Commission (DG Environment) has also decided, following a recommendation from EAN, to support EURAIDE (European Accident and Incident Data Exchange). This project, co-ordinated by NRPB from the UK, was completed in December 2003. This pilot study has proposed a management scheme for a radiation accident and incident data exchange system at the European level.

After the first workshop (ALARA and Decommissioning), a working group (of university representatives) for decommissioning of accelerators has been set up in Belgium to follow up the recommendations made. In Sweden several ideas from that workshop were used when writing Regulations on Planning for and during Decommissioning of Nuclear Facilities.

After the second workshop (Good radiation practices in industry and research), the French society on radiological protection has set up a network to provide lessons learned from occupational radiological incidents (RELIR), and a new regulatory system to follow up incidents have been set up in Norway. Since then, the regulatory bodies in Austria, Switzerland and the Netherlands, as well as AVN in Belgium, are investigating solutions to create such systems. The workshop also provided the impetus for the continuation of the IRID system in the UK and the wider dissemination of the lessons learned from accidents via the NRPB website. After the third workshop (Management of internal exposure), in Germany parts of the recommendations from the third workshop have been introduced into regulatory guidelines (for example the draft guideline “Physical radiation protection control-incorporation monitoring”). The improvement of the management of internal exposure is also being studied in the Netherlands. In the UK, the regulatory authorities have commissioned further studies into the dosimetric data applied to intakes of NORM, with the eventual aim of incorporating these into regulatory guidance. The fifth and sixth workshops (respectively on industrial radiography and on medical occupational exposure) have had an impact on many stakeholders behaviour in several countries. The regulatory body in the Czech Republic now organises seminars with non-destructive testing companies, using the material from the fifth workshop. This has led to an improvement of co-operation between these partners. That workshop has also influenced the discussion of the authorities with the Dutch radiographers. The regulatory body in the Netherlands intends to integrate some recommendations from both workshops into guidance. In Italy, the medical health physicists often refer to the sixth workshop, and in Sweden an analysis of the doses received by personnel in the medical field is planned as a result of the workshop. In Germany, the Rome workshop has increased the co-operation between the German Society of Non-destructive Testing and the ALARA network. This is considered very important for harmonisation in terms of the safety of equipment and the development of practical requirements; it is expected to lead to the development of specific German guidelines Safety in Technical Radiography. Furthermore, the new regulations in Norway now more clearly address the need for competence in radiological protection, following recommendations from several workshops.

Following the eighth EAN workshop (Inspection and self-assessment), Ireland is currently revising its licensing conditions to implement several of the workshop recommendations, in particular those relating to self-assessment and internal regulation.

Looking at the format and results of the EAN, the **International Atomic Energy Agency** of the United Nations has started a process to set up similar networks in other regions in the world. It is therefore expected that the EAN will help in the setting up of other regional ALARA networks in the world.

## Conclusions

The network is considered dynamic, allowing all countries and participants to benefit easily from each other. The network is not very costly and provides a lot of outputs to participating individuals or institutions (information, brainstorming together, paper or electronic documents).

All countries remain interested in the further development of training standards, monitoring systems and techniques, schemes for control and inspection, feedback systems on incidents, and research projects on ALARA implementation. Furthermore, there is still progress to be made to achieve greater reach coherence and homogeneity, and to harmonise policies and practices. In this context, the network remains very useful. All partners, both within the steering committee and from other origins, commit themselves to the continued work of EAN.