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European ALARA Newsletter

Editorial

This issue of the Newsletter illustrates new means by which the Network intends to facilitate ALARA implementation within Member and Candidate States:

- the use of the Network as a vehicle to support European surveys on topics of interest for radiological protection
- the creation of new systems to facilitate the exchange of information concerning safety factors and particularly doses.

The first EAN survey presents a picture of the situation on the implementation of the Basic Safety Standards (European and International) into the different national regulations, as far as the three principles, justification, optimisation and limitation are concerned. The main conclusions of that survey are that, as a result of the BSS, all three principles will be applied across Europe in a much more consistent manner than previously. Justification is probably the biggest change since it was commonly excluded from previous regulations and is now clearly addressed, many countries also defining procedures for its implementation. The optimisation principle has been translated into the different national structures more often with explicit references to "economic and social factors". More significantly, there is increasing emphasis on applying and demonstrating optimisation in practice, in either the regulations or supporting guidance.

Contents of Issue #9

Several participants to the Network are institutions having research reactors. Unlike Nuclear Power Plants that use the IAEA/NEA OECD ISOE system, these institutions do not have any formalised system to regularly exchange information concerning safety factors and particularly doses. EAN will facilitate these exchanges to promote improvement of safety at these institutions by comparison with best practices. It is intended that the European ALARA Newsletter and web site should be used to publish anonymous benchmarking results.

The 2nd EAN Workshop on "Good Radiation Practices in Industry and Research" (Chilton, November 23-25, 1998) identified that industrial radiography was responsible for a significant number of above average annual doses and was the predominant sector responsible for serious radiological accidents. It was also noted that there was scope for improvement in the optimisation of radiation protection (the ALARA principle) in industrial radiography, especially through improvements in radiographic equipment safety and worker training. As a result EAN will organise October 17-19, 2001 at Rome a specific workshop, the **5th EAN Workshop**, on **Industrial Radiography** for all interested parties (and particularly manufacturers, NDT societies and clients) to discuss ways of improving occupational radiological safety both in terms of equipment, training and culture.

The 4th EAN Workshop (Antwerp, November 20-22, 2000) aimed at providing an opportunity to put radiological risk management into context with the management of other occupational risks, by engaging interested parties in the exchange of information and experience. Three major conclusions were raised during that Workshop: "To effectively manage occupational risk(s), implies the development of a common risk culture among all stakeholders". "Risk transfers is a major topic we have, and will have more and more to deal with. Therefore it is very important to learn how to manage them, through a better knowledge of these transfers and adapted new procedures". "Promotion of the participation of all concerned stakeholders appears to be a key point to decide what is reasonable." More detailed conclusions and recommendations will be provided in the next issue of the Newsletter.

Finally in order to facilitate the exchange of information with more individuals and institutions the EAN will provide the papers from the Workshops on its web site (http://ean.cepn.asso.fr). The first available set of papers is that of the third Workshop (Neuherberg, November 15-18, 1998) on "managing internal exposures".

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Justification, Optimisation and Dose Limits, the Recent Evolution of National Regulations in the European Countries

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❑ Introduction

The Euratom Basic Safety Standards for the radiological protection of workers and the general public against the dangers arising from exposure to ionizing radiation were laid down in Directive 96/29/Euratom adopted by the Council in May 1996. It should have been implemented in Members States before 13 May 2000. Other European countries should refer to the "International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources" issued in 1994 and jointly sponsored by FAO, IAEA, ILO, OECD/NEA, PAHO and WHO.

The objective of this paper, prepared with all EAN contact persons (see page 10) is to review the progress in implementing these Basic Safety Standards in the national regulations of European countries. This paper will describe specifically how the three fundamental principles of radiological protection have evolved (justification, optimisation and limitation).

Even if the implementation of the Directive was expected before mid-May 2000, not all the different Member States have today integrated it into their national laws. However, in those countries where it is not yet integrated, the projects are quite close to the final draft and will be therefore referred to in that presentation.

Table 1. Status of the Implementation of the Basic Safety Standards in the Regulations of European Countries (January 2001)

EC COUNTRIES	Progress in the implementation of the BSS	Expected Date of implementation of the BSS
Austria	Draft	Expected 2001
Belgium	Draft	Expected 2001
Denmark	**Implemented**	1 January 1998
Finland	**Implemented**	Before 13 May 2000
France	Draft	Expected mid 2001
Germany	Draft	2001
Italy	Ready	1 January 2001
Spain	Ready	Expected January 2001
Sweden	**Implemented**	1 December 2000
The Netherlands	Ready	May / September 2001
UK	**Implemented**	1 January 2000
NON EC COUNTRIES		
Czech Republic	Ready	*1 July 2002*
Norway	**Implemented**	*2000*
Switzerland	**Implemented**	*1994*

❑ Justification Principle

The justification principle is the first fundamental principle of the system of radiological protection recommended by the International Commission on Radiological Protection (ICRP). In the EURATOM Directive justification is not mentioned as a radiation protection principle, but as a "general principle". It is the first "radiation protection requirement" in the International BSS.

➨ *Previous situation*

In most regulations, this principle was not specifically addressed before the implementation of the new BSS. Instead, all practices actually implemented were implicitly considered as justified. However, some practices or trades were explicitly named as unjustified and consequently forbidden in the national regulatory texts. These included, for example, fluoroscopy for shoe-fitting, fishing floats, trade in beta lights (e.g. in the Netherlands), radioactive substances added in the production of foodstuffs, toys, personal ornaments and cosmetics (e.g. in Italy, Sweden, France) and lightning conductors (Italy, France). In Germany, there were no practices directly forbidden, however, there was always agreement between the Federal Ministry and all the Länder Authorities on practices they would or would not authorise.

➨ *Implementation of the new BSS*

Once the new BSS will be implemented, the justification principle will be explicitly stated in almost all national regulations.

Wording

"Member States shall ensure that all new classes or types of practice resulting in exposure to ionizing radiation are justified in advance of being first adopted or first approved by their economic, social or other benefits in relation to the health detriment they may cause. Existing classes or types of practice may be reviewed as to justification whenever new and important evidence about their efficacy or consequences is acquired". (Council Directive 96/29/EURATOM, General Principles, Article 6.1 and 6.2)

"No practice or source within a practice should be authorised unless the practice produce sufficient benefit to the exposed individuals or to society to offset the radiation harm that it might cause; that is: unless the practice is justified, taking into account social, economic and other relevant factors" (IAEA Safety series 115, International Basic Safety Standards, Principal Requirements § 2.20-§ 2.22)

A quick reading of the wording associated with the justification principle subsequently adopted in the European national regulations gives the impression that they are very close to the above. In fact, the wording used mostly reflects "cultural"differences.

In **Germany**, the justification principle was already stated in the former Radiation Protection Ordinance. However, it is now stated even more explicitly, closely following the wording in the European Directive.

In **Switzerland** (which does not belong to the EC), the justification principle is explicitly noted in the Federal Act on radiological protection (art. 8) and in the corresponding ordinance (art. 5).

In France, Denmark, the Netherlands and Norway (which does not belong to the EC), the justification principle is applied to a very large set of human activities (and goes beyond articles 6.1 and 6.2 of the European Directive):
"the economic, health or other benefits that arise from an activity or an intervention shall be greater than their inherent inconveniences"(**France**, **Sweden**).
"the benefit should outweigh the health damage. If not justified, a practice is not allowed."(**The Netherlands**).
"at every use of radiation the advantages shall go beyond the risks"(**Denmark**).
"any human activity involving radiation sources has to be defendable: the benefits of the activity shall exceed the risks associated with the radiation"(**Norway**).

In Finland and Sweden, the justification principle applies mainly to practices (a practice is a human activity that can increase the exposure of individuals to radiation) :
"the benefits accruing from the practice shall exceed the detriment it causes"(**Finland**).
"anyone who conducts a practice with ionising radiation shall ensure that the practice is justified by which is meant that the use of radiation gives a benefit that exceeds the estimated health detriment caused by the radiation"(**Sweden**).

In **Spain** and **Belgium**, the justification principle is mentioned only for new practices:
"all new classes or types of practice involving exposure shall be justified by the promoter to the competent Authority, which will then decide on […] its adoption considering the benefits in relation to the health detriment they may cause"(**Spain**).
"The different types of practices leading to ionising radiation exposures shall be justified before the first adoption or the first authorisation, taking into account and balancing the corresponding advantages and drawbacks, including the health aspects"(**Belgium**).

Austria is the only country where it is stated that established practices are considered justified as long as no important new insights prompt reconsideration. Application of new practices has to be justified.

In the **United Kingdom**, the justification principle has not previously been explicitly addressed in occupational exposure legislation. It is recognised that an appropriate legal instrument will have to address this. However giving the justification principle legal force within the UK legislative system has posed a number of regulatory enforcement issues. A proposed way forward is currently being considered by Ministers.

Legal Requirements

Some national Authorities have specified regulatory requirements for enforcing the justification principle: these include lists of justified and unjustified practices, evaluation procedures of practices, etc.

In **Germany**, some practices (for example, the irradiation of filters from water supply stations with Co-60 sources which was a common practice in East Germany before the reunification) or particular uses of radiation (consumer products such as ordinary watches containing radioactive material) will be explicitly forbidden in the "administrative provisions" which accompany the implementation of the rules laid down in the Ordinance. The decision whether a practice is justified or not is taken by the Federal Ministry of Environment, Nature Conservation and Nuclear Safety on the basis of a common understanding with the Länder Authorities.

In **Belgium**, before the acceptance of a new activity or practice, it is now mandatory to undertake a justification study that can be reviewed by the competent authority.

In **France**, it is now clearly stated that the competent authority in pursuance of the justification principle could forbid a nuclear activity.

In **Spain**, the authority (CSN) may propose to review the justification of existing practices whenever new and important evidence about their efficiency or consequences is revealed. The justification of a new practice has to be approved by the competent Authority, e.g. the Government Departments and by the CSN. The CSN is the only competent Authority for the justification revision of existing practices.

In the **Netherlands**, there will be a ministerial Ordinance with a list of justified and a list of non-justified practices and work activities. If the activity is not on the list as a "justified practice", it will be forbidden, unless a request for justification, with good supporting arguments, is approved.

In **Switzerland**, activities involving ionising radiation leading to an effective dose less than 10 µSv/year shall always be regarded as justified.

The justification principle is now re-emphasised in nearly all countries. This is accompanied by a stronger control by Authorities of activities involving radioactive substances.

❑ Optimisation Principle (ALARA)

The optimisation principle has been remphasized as the core of the system of radiological protection in the ICRP Publication 60 and in the European Basic Safety Standards.

➨ *Previous Situation*

The optimisation principle was already stated in most national laws, albeit in general terms, often without any practical guidance (but in countries like the UK through an approved code of practices). Consequently, the application of optimisation for practices was often quite limited.

➨ *Implementation*

The implementation of the new BSS appears to provide both the Authorities and users of ionizing radiation sources with more precise guidance on how to apply the optimisation principle.

Wording

"In the context of optimization [Member States shall ensure that] all exposures shall be kept as low as reasonably achievable, economic and social factors being taken into account". (Council Directive 96/29/EURATOM, General Principles, Article 6.3)

"In relation to exposures from any particular source within a practice, except for therapeutic medical exposures, protection and safety shall be optimised in order that the magnitude of

individual doses, the number of people exposed and the likelihood of incurring exposures all be kept as low as reasonably achievable [ALARA], economic and social factors being taken into account, within the restriction that the doses to individuals delivered by the source be subject to dose constraints". (IAEA Safety Series 115, International Basic Safety Standards, Principal requirements § 2.24)

In the **Netherlands**, "the undertaking shall ensure that the equivalent or effective dose to individuals, taking account of the number of exposed individuals, due to a practice is as low as reasonably achievable. The undertaking shall ensure that, regarding the potential exposures, both the doses in the case of an exposure and the probability of an exposure is as low as reasonably achievable. With regards to this Decree and all related requirements, for the assessment of what is 'reasonably achievable', economical and social aspects shall be taken into account."

In the **United Kingdom**, "every radiation employer shall, in relation to any work with ionising radiations that he undertakes, take all necessary steps to restrict so far as is reasonably practicable, the extent to which his employees and other persons are exposed to ionising radiation".
This wording is unchanged from the previous regulations.

In **Spain**, "the magnitude of individual doses, the number of people exposed and the likelihood of incurring exposures, shall be kept as low as reasonably achievable, economic and social factors being taken into account."

In **Finland**, "the practice shall be organised in such a way that the resulting exposure to radiation hazardous to health is kept as low as reasonably achievable."

In **Denmark**, "all doses shall be as low as reasonably achievable."

In **Belgium**, "all exposures shall be kept as low as reasonably achievable, taking into account social and economic factors".

In **France**, "equipment, processes, and work management shall be conceived so that occupational individual and collective exposures shall be kept as low as reasonably achievable […], technical, economic and social factors being taken into account."

In **Sweden**, "anyone who conducts a practice with ionising radiation shall ensure that the radiation protection measures are optimised, which means that exposures of people are as low as reasonably achievable, economic and social factors being taken into account."

In **Italy**, there is no new wording of the ALARA principle: the ALARA principle was already mentioned with reference to exposures of workers and persons of the public and to technical requirements the installations must fulfil.

In **Germany**, in the new Ordinance, the ALARA principle is stated unchanged and as a general guidance, which is, however, legally binding in all cases. The wording is: "… also below the dose limits, unnecessary radiation exposure or contamination of men and environment should be kept as low as possible, according to the latest technical and scientific standards and taking into consideration all conditions related to an individual case." In fact, German law promotes the "minimisation" principle together with the "principle of proportionality", which means: doses are reduced to levels as low as reasonably possible.

In **Norway**, the basic principles, justification, optimisation and dose limitation, are stated in a general article with a requirement that any human activity involving radiation sources has to be defendable: it is stipulated that the activity must be prepared to avoid acute effects and to minimize the risks for late injury as low as reasonably achievable.

In **Switzerland**, the conditions for realising the optimisation principle are described in the Radiological Protection Ordinance (art. 6).

Although in many cases the evolution of the optimisation principle wording is not revolutionary, it refers now explicitly to economic and social factors in many countries.

Guidance for Practical Applications

In addition to the basic regulatory requirement that exposures have to be optimised, regulators have increasingly introduced guidance on how this principle should be applied in practice.

For example, in **France**, a specific Decree concerning the protection of workers against ionising radiation (Decree n° 98-1185 modifying the Decree n° 75-306, Art. 20 bis) says: "work stations which expose workers to ionising radiations shall be analysed periodically to review the doses received. The frequency of these review must be a function of the level of the doses. In particular, during an operation in a controlled area, the manager of the plant in collaboration with the employer - if he is not the manager – is in charge of:

- a prior assessment of the collective and individual doses that might be received by workers,
- having the actual doses received during the operation registered and analysed in order to draw conclusions from the radiation protection point of view; if it is technically possible, these measurements should be made in real time with immediate reading devices ("the operational dosimetry").

For the prior assessment of doses, the draft of the new Decree specifies that "the radiation protection qualified expert in conjunction with the persons responsible for the operation, shall define individual and collective doses targets (which are not comparable to the regulatory limits)".

In the **Netherlands**, a dose prediction has to be performed by undertakings when requesting a licence and when planning work activities, with regards to members of the public off site and to workers on site. These predictions are evaluated by authorities and sometimes more reduction is required. Most sites are required to give a yearly overview of the real time measures or calculations both for workers on site and for members of the public off-site.

In the **Swedish** regulations it is stipulated that, in order to demonstrate the compliance with the optimisation principle, the licence-holder shall ensure that appropriate goals and control actions are established and documented and that the necessary resources are available (*SSI Code of Statutes, SSI FS 2000:10, Regulations on Radiation Protection of People Exposed to Ionising Radiation at Nuclear Plants*). The goals and control actions shall be appropriate to the particular

plant and be drawn up to take care of daily as well as long-term radiation protection. All individuals that are exposed to ionising radiation or are decision-makers in matters that affect the individual doses shall be informed of the goals and the means of control. The practice, including the goals and control actions, shall regularly be followed up and evaluated. Such evaluations shall be performed at least once a year. Documentation on the evaluation shall be sent to the Swedish Radiation Protection Institute.

In **Finland**, the radiation exposure to which workers are subjected and the factors affecting it, shall be assessed in advance, also taking into account exceptional working conditions.

In **Spain**, CSN has approved a new guide within the Nuclear Power Plants Safety Series where the main recommendations regarding the management of radiation exposure optimisation are presented. This guide comprises the ALARA responsibility assignments to all the involved parties. Besides a well established ALARA policy, it is necessary to implement a set of actions, called ALARA program, to be addressed by the licensee such as ALARA goals, work management, source term control and reduction, ALARA review of design modifications, special training and internal audits. The guide covers these aspects in a wide and flexible way to be adaptable to different circumstances. This document applies to utilities and contractors involved in all the phases of activity in nuclear power plants: design, construction, operation, dismantling and modifications.

In the **UK**, IRR99 are supported by an Approved Code of Practice (ACoP), which has a legal significance and by Guidance material, that though having no legal significance gives a very strong indication of what is practically needed to demonstrate compliance. Prior risk assessment is mandatory in the UK: "Before a radiation employer commences a new activity involving work with ionising radiation … he shall make a suitable and sufficient assessment of the risk to any employee and other persons for the purpose of identifying the measures he needs to take to restrict the exposure of that employee or other person to ionising radiation. […] A radiation employer shall not carry out work with ionising radiation unless he has made an assessment sufficient to demonstrate that all hazards with ionising radiation have been identified; and the nature and magnitude of the risks to employees and other persons arising from those hazards have been evaluated". The ACoP specifically requires, where relevant, the risk assessment to include several factors including "the estimated dose rates to which anyone can be exposed" and to take into account "the results of any previous personal dosimetry or area monitoring relevant to the proposed work".

In **Germany**, the Ordinance was already supported by guidelines issued by the Federal Minister of Environment. For example, the guidelines on radiation protection of maintenance and repair of work in light water reactors gives guidance on what is necessary in order to minimise doses. The estimated collective dose for each Nuclear Power Plant for the following year is required for plant personnel and contractors. If predicted collective doses are higher than 50 man.mSv, or individual doses higher than 10 mSv, specific procedures are required (job planning, step-by-step time and dose calculation, discussion with authority experts, preparation of protection actions, close supervision during the work, stopping the work and new planning if problems occur, step-by-step documentation on job time, dose values and radiological measurements).

The optimisation principle has grown into a stricter regulatory requirement in almost all new regulations, including prior dose assessment, operational dosimetry, information of stake-holders, ALARA responsibility assignments…

❑ Limitation

➨ *Dose Limits for Deterministic Effects*

There are no major changes to the limits for avoiding deterministic effects. For workers, the limit in terms of dose equivalent to the lens of the eye is 150 mSv/year (50 mSv/year for minors); in terms of dose equivalent to the skin the limit is 500 mSv/year (generally over 1 cm2 of skin instead of 100 cm^2 in the past; 150 mSv/year for under age people); and in terms of dose equivalent to the hands, forearms, feet and ankles, the limit is 500 mSv/year (150 mSv/year for under age people). In Germany, there are also organ dose limits for gonads, uterus and red bone marrow (50 mSv/year); thyroid and bone surface (300 mSv/year); colon, lung, stomach, bladder, breast, liver, oesophagus and other organs and tissues (150 mSv/year). In Germany, in specific circumstances the limit is 300 mSv for the lens of the eye, and 1000 mSv for other organs.

➨ *Dose Limits for Stochastic Effects*

Table 2 gives the new individual dose limits in the countries that have already implemented the BSS, and the most recent drafted values in the other European countries that have yet to implement them.

All countries have, or will have, a dose limit for the public that is 1 mSv per year, Denmark and Finland specifying that such a limit corresponds to the contributions of all sources together. However, some countries have been or will be more restrictive with regards to each source. The UK, Germany and the Netherlands have specified that each source may not contribute to more than respectively 0.3, 0.3, and 0.1 mSv per year.

The situation is somehow different in the case of occupational exposure limits. The interpretation of the BSS has led the countries to select either 100 mSv for five years with a maximum of 50 mSv per single year (Finland, Spain, Sweden, Czech Republic, Switzerland), or to be more stringent in selecting 20 mSv per calendar year (Denmark, Germany, Italy, the Netherlands, UK, Norway) or per 12 consecutive months (Austria, Belgium, France).

Two countries have introduced an averaged dose limit of **10 mSv**:

- 100 mSv per 10 years in Italy
- 400 mSv over the work life in Germany

Table 2. Dose Limits for Stochastic Effects (mSv)

COUNTRIES	Members of Public	"Workers A" and Major Students	"Workers B" and Minor Students	Pregnant Women and Foetus	Workers in exceptionnal circumstances (excluding emergency situations)
EC EURATOM DIRECTIVE 96/29	1 / year	100 / 5 years & 50 / year	6 / year	1 (fœtus)	-
Belgium	*1 / year*	*20 / 12 rolling months*	*6 / year*	*1 (fœtus) and if likely >1 women work outside controlled areas*	*2 x annual limits per operation / 12 rolling months & < 5 x annual limits (doses already received included)*
Denmark	1 / year 0.1 / source	20 / year	6 / year	1 (fœtus)	-
Finland	1 / year	100 / 5 years & 50 / year	6 / year	1 (fœtus)	-
France	*1 / year*	*20 / 12 rolling months*	*6 / year*	*1 (fœtus)*	*2 x annual limits per operation*
Germany	*1 / year* *0.3 / site*	*20 / year* *400 / lifetime*	*6 / year*	*1 (fœtus), 2/month (uterus)*	-
Italy	*1 / year*	*100 / 10 years &* *20 / year*	*6 / year*	*?*	*?*
Netherlands	*1 / year* *0.1 / source*	*20 / year*	*6 / year*	*unlikely > 1 (woman) ***	*100 / operation*
Spain	*1 / year* *5 / 5 years **	*100 / 5 years & 50 / year*	*6 / year*	*1 (fœtus) & unlikely > 1 (woman) ***	*case by case (needs CSN approval)*
Sweden	1 / year	100 / 5 years & 50 / year	6 / year	1 (fœtus) **	case by case (needs SSI approval)
UK	1 / year 0.3 / source	20 / year	6 / year	1 (foetus) 13 / 3 months (abdomen equiv. dose) ***	100 / 5 years & 50 / year
INTERNATIONAL BSS (1994)	1 / year	*100 / 5 years & 50 / year*	6 / year	-	*200/10 years & 50/year (review when over 100) or 50/year renewable 5 times*
Czech Rep.	*1 / year* *5/5 years **	*100 / 5 years & 50 / year*	*6 / year*	*1 (foetus) unlikely > 1 (woman) ***	*50 / year ("specific circumstances")* *500/5 years ("unusual events")*
Norway	1 / year	20 / year	6 / year	?	?
Switzerland	1 / year	100 / 5 years & 50 / year	5 / year	2 (abdomen surface effective dose)	100 / 5 years & 50 / year

Italic characters: not yet implemented (January 2001)
** in specific cases ; ** for the remainder pregnancy period ;* *** for women of reproductive capacity

❑ Conclusion

The full implementation of the BSS across Europe has still to be achieved. In addition, the principles of justification, optimisation and dose limitation have to be incorporated into a number of very different national regulatory structures. Despite this, there is evidence to suggest that all three principles will be applied across Europe in a much more consistent manner than previously, as a result of the new BSS.

Justification is probably the biggest change since it was commonly excluded from previous regulations. The optimisation principle has been translated into the different national structures in a consistent manner.

More significantly, there is increasing emphasis on applying and demonstrating optimisation in practice, in either the regulations or supporting guidance.

The flexibility in the BSS for setting effective dose limits has been reflected in national regulations. Consequently, different European countries specify either a 1 year or a 5 years effective dose limit, or a combination of both. In practice, where the optimisation principle is observed, these differences are not expected to cause practical difficulties.

Evolution of the Radiological Protection: Summary of comments made at IRPA10 Congress by IRPA Member Societies

❑ Background

In the autumn 1999 the International Radiation Protection Association (IRPA) invited its member Societies to comment on Professor Roger Clarke's "Controllable Dose" paper and subsequent article "Control of Low Level Radiation Exposure: Time for a Change?" which was published in the Journal of Radiation Protection (Vol. 19, No. 2, pp. 107-225, 1999). It was considered that such a review undertaken by the radiation protection practitioners community would provide a timely stock take of the effectiveness of the current framework for radiological protection, and provide important input to ICRP's early deliberations on new or revised recommendations for the future.

The IRPA 10 Congress formed the obvious focus for bringing together the response from the various Societies. Many Societies had formed working groups or undertaken member consultation exercises, in order to develop a view on the Clarke paper. In the interim, the debate had continued with Professor Clarke participating in a number of prestigious meetings and bodies such as NEA-CRPPH

publishing related reports or commentaries. The collection of replies from the Societies presented in this report, and the summary below therefore, represent an unreconstructed view of the Clarke article and do not necessarily take account of some of the most recent developments in the thinking of the author or the evolution of the "new" philosophy.

The report includes those written comments from Societies made available to IRPA and/or presented at IRPA 10 up to now. ICRP may receive direct comments from Societies or individual radiation protection practitioners. IRPA has made no attempt to process or to analyse the Society responses and the following summary which largely follows the highlight report to IRPA 10, seeks only to draw attention to some of the main themes emerging from the contributions and discussions at the Congress.

❑ Summary

Although it was not the intention of the IRPA 10 session to reach any consensus, nonetheless some early common themes emerged from the papers and discussions.

◆ The process and mechanisms for engaging the protection community through IRPA and the Societies in the review of new ICRP proposals were universally welcomed and applauded.

◆ The basic principles of justification, optimisation and dose limitation have proved sound. Hence in any ICRP review, it was necessary first to concentrate on rectifying defects or weaknesses in the present system before introducing more radical changes or even a new system of protection. In making such changes it would be important to take account of the benefits and the costs of change.

◆ While the current system for radiation protection may be viewed as complex and difficult to explain to and reconcile with lay audiences, it is important to differentiate between what can sensibly and reasonably be simplified and what is actually a presentational and communications problem. These two require different solutions and the involvement of different mix of experts in researching and developing these solutions.

◆ A unified and fully integrated system for radiation protection while laudable may only seek to further complicate and confuse. It may be necessary to acknowledge that a limited number of activities eg., radiotherapy, while satisfying certain core RP criteria, will be better dealt with by a series of application specific, risk management recommendations and guidelines. The current system allows for differing regimes for different types of exposure situations. These flow directly from the varying risk and exposure management requirements effective in each category of exposure.

◆ As far as possible any RP framework should be robust to thinking on dose-effect relationships. In significant areas of radiation protection practice, the resolution of the LNT debate will not radically alter standards or requirements for protection.

It is important to separate out the underpinning science and the associated limitations, and the risk management aims and objectives. This should be first and foremost a framework for responsible risk management and risk control.

◆ In several areas of the present system, eg., justification, optimisation and quantified risk assessment and collective dose, the fundamentals were appropriate, but there is still a lack of clear interpretation as to how they are to be applied in practice, in a manner that is transparent and acceptable to practitioners, workers, and the public. If the framework is considered to be a compendium of indicators and tools, then these need to come with full instructions as to the proper and appropriate use. ICRP could help in this, but it is also a matter for organisations including IRPA, IAEA and NEA. There is a need too to place RP in the context of other occupational risks.

◆ Other stakeholders including professionals, interest groups and the public, need to be brought into the debate. Professionals are cautioned that they too often assumed knowledge of what concerned and confused the public and other non-specialist groups without checking these assumptions. The mechanisms for wider consultation and involvement need to be developed and the role of IRPA and societies in these clarified.

◆ It will be necessary to address in its own right protection of the environment, including biota, in the new system but much work needs to be done before this can be achieved. Important lessons can be learnt from other areas eg., chemicals, where protection of the environment is further developed than for radiations.

◆ Great care is necessary with language, terminology and concepts, especially in not introducing new definitions unless they are absolutely necessary. Allied to this, is the need for early commitment to an effective communications strategy with both the RP community and other stakeholders with the aim of achieving widescale engagement in and ownership of the evolving protection framework.

◆ More thinking and development are needed on the way in which quantities such as collective dose, "trivial" dose and concepts such as referencing dose/exposures to background levels, action levels and ALARA/ALARP are to be understood and used in the new system. In particular, the logic and mechanisms for wholesale abandonment of collective dose, for pre-setting a trivial dose level and replacing dose limits with action and investigation levels, are not apparent.

◆ Whatever revisions to the current system are proposed, these should be carefully "road tested" for their application before being firmly adopted.

◆ The continued involvement of the RP practitioners in the development of ICRP thinking is strongly advocated, and the next version of the proposals is eagerly awaited.

ALARA NEWS

International Conference on Radiation Dose Management in the Nuclear Industry

BNES Conference, Windermere, Cumbria, UK
14-16 May 2001

The aim of this international conference is to provide a forum for the presentation and discussion of experience in the management of radiation exposure in the nuclear industry.
Since the publication of ICRP 60, and its implementation in national regulations, there have been significant changes in the approaches to the control of occupational exposure.
Levels of exposure have reduced considerably but regulatory pressure remain for further reduction and for continuous demonstration that exposure is as low as reasonably achievable.
In parrallel with this, the nuclear industry is under pressure to reduce costs and increase efficiency. This means that it is ever more important to ensure that radiological factors do not unduly constrain the operation, maintenance or cost-effective decommissioning of plant.
The solutions to the problems of dose reduction are complex. They involve a scientific approach to the understanding of the sources of exposure, good engineering in the design and operation of facilities and efficient management of radiation protection.

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Feedback from the First Belgian ALARA Day

On the 23rd of November 2000, the first Belgian ALARA Day was held in Antwerp. Organised immediately after the 4th European ALARA Network Workshop, this day provided to more than 70 participants the opportunity to present their point of view as far as optimisation is concerned. Speakers coming from the Regulatory Body, the Control Body and from almost all nuclear Belgian nuclear installations brought their conclusions to the attendees.

Their way for implementing optimisation is quite different: sometimes, it constitutes a part of the general risk assessment, sometimes it focuses more on calculations (dose vs costs). Some participants have also indicated the limits of optimisation, some others were asking whether ALARA has really changed something as far as RP is concerned!

This brief summary shows without doubt the need for such meetings. More time need to be given for exchanges on the practices. This will be taken as a main objective for the next Belgian ALARA Days.

P. Deboodt

Third International Symposium on Naturally Occuring Radioactive Materials NORM III

Paleis voor Congressen, Brussels, Belgium
17-21 September 2001

It is well-known that individual and collective doses from natural sources are generally higher than those from artificial sources. For historical reasons different standards and approaches have evolved for the exposures from naturally occurring and artificially produced sources of radiation. Many persons find this reasonable from a practical perspective whilst others argue that this is inappropriate since there is no difference in dose received.

Therefore, the implementation of Title VII of the new Basic Safety Standards is a challenge for regulators, radiation protection practitioners and industries.

This symposium will focus on work activities involving operations with and storage of materials, not usually regarded as radioactive, but which contain naturally occuring radionuclides, causing a significant increase in the exposure of workers and, where, members of the public.

Particular attention will be given to problems related to the harmonization of the regulatory approach in the different EU-countries.

For the involved processing industries the point of view will be presented of radiation scientists, radiation protection agencies as well as of the operators.

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3rd National Conference of the French Radiological Protection Society "SFRP 2001"

Centre International de Congrès "Vinci", Tours, France
19-21 June 2001

This conference should allow to favour exchanges of experiences between professionnals of protection against ionising and non-ionising radiations. The following themes will be especially tackled:
- Scientific basis of radiological protection
- General principles of radiological protection and regulation
- Dose measurements techniques
- NORMs
- Occupational exposure management in industrial, nuclear, medical and research sectors
- Radiological protection during accidental situations
- Radiological protection in contaminated territories
- Communication
- Non ionising radiations

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5th European ALARA Network Workshop on "INDUSTRIAL RADIOGRAPHY: Improvements in Radiation Protection" Rome, Italy, 17-19 October 2001

FIRST ANNOUNCEMENT AND CALL FOR PAPERS

❑ BACKGROUND

The 2nd EAN Workshop on "Good Radiation Practices in Industry and Research" (Oxford, December 1998) identified that industrial radiography was responsible for a significant number of above average annual doses and was the predominant sector responsible for serious radiological accidents. It was also noted that there was scope for improvement in the optimisation of radiation protection (the ALARA principle) in industrial radiography, especially through improvements in radiographic equipment safety and worker training. As a result EAN felt it was worthwhile to organise a specific workshop on industrial radiography for all interested parties (and particularly manufacturers, NDT societies and clients) to discuss ways of improving occupational radiological safety. Further details of the 2nd Workshop and its recommendations can be found on the EAN web site (http://ean.cepn.asso.fr).

❑ OBJECTIVES OF THE 5th WORKSHOP

The workshop will focus on industrial radiography (gamma and x-ray sources, enclosures and open work), taking the results and recommendations of the 2nd Workshop as a starting point. The aim is to define the main ALARA issues and to provide stakeholders (EC, regulatory bodies…) with recommendations for practical improvements in radiation protection in the following areas:

- **Radiographic equipment (including dose and dose rate measuring equipment)**
  - What are the key features of such equipment necessary for implementing ALARA?
  - What advances have been made in radiographic and dosimetric equipment to improve radiological safety?
  - How might further improvements in radiological safety be achieved?
  - What are the alternative methods for NDT?
- **Training in radiological protection**
  - What is the minimum standard of training for industrial radiographers?
  - What should the training syllabus include?
  - How should training effectiveness be assessed, and should radiographers be licensed?
  - When is refresher training required?
- **Safety culture, management and organisation**
  - What are the working pressures on radiographers and what effect do they have on radiological safety?
  - What is the optimum safety organisation in a radiography company?
  - What role do the clients and regulators have in achieving optimisation?

❑ TARGET AUDIENCE

The Workshop provisionally aims to attract 80-100 persons. Participants from the following are encouraged:

- International radiological protection organisations
- Regulatory bodies
- Persons with responsibility for radiological protection training and qualifications
- Manufacturers of industrial radiography equipment, including dose and dose rate measuring devices, and suppliers of radiography sources
- National and international NDT societies, institutes and associations
- Clients of industrial radiographers
- Representatives from the workers

CALL FOR PAPERS

Authors wishing to provide oral and poster **presentations** are invited to submit an abstract of 15-20 lines (A4) typed single-spaced in Times 12 pt (Word format). **Poster presentations**, in relation to training and safety culture, are especially invited. There will also be (limited) space available for **exhibition of radiographic equipment**. All abstracts and suggestions should be forwarded to the Workshop Programme Committee at the following Email address:

dascenzo@cepn.asso.fr (by mid April 2001)

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