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European ALARA Newsletter

Editorial

WHAT I BELIEVE IN: INDIVIDUALS BEING THE NETWORK'S HEART

Individuals want to be involved and make their choice

Increasing room for the involvement of individuals is part of the development in present societies. Individuals want to make their own choices concerning where they place their moral trust or their social links. There also appears to be a greater desire by individuals to manage their own risks. Imposed collective answers to which there has been no personal opportunity to contribute are increasingly considered unacceptable and inefficient.

From the beginning, radiological protection has had two main dimensions: to protect the individuals' health against the pathological effects of exposure to ionising radiations and to protect the human society against the global health and safety impacts of the use of radiation. However, most aspects of radiological protection have been developed within institutional, legal, and procedural frameworks, providing collective top-down decisions dealing mainly with public health, security and safety concerns.

In the above mentioned context, I think that it is very important to give more room to individuals in the decision processes that affect their radiological protection.

An important improvement: the involvement of social groups

ALARA is a pragmatic and open-minded concept, which has been shown to be effective for managing radiation protection, but which has limits within a solely top-down approach. Therefore, for one or two decades, ALARA has evolved towards the so-called stakeholders involvement and commitment. Workers, managers, local communities, environmental associations, etc are social groups with their own interests sometimes convergent, sometimes contradictory. ALARA gives then rise to a more bottom-up approach relying on a kind of co-responsibility between different stakeholders. Therefore, a new challenge is to get a common understanding of how the balance of stakeholder input to the decision making process and the sharing of responsibilities will work in practice.

However, individuals belonging to each group have had a relatively small voice, compared to those who are part of the management processes. The latter seem to be considered more representative of the group than individuals with their real life personal experience, their personal sensitivity, their individual body, and their individual approach to health, to risks and in particular to radiological risk.

The involvement of the stakeholders is an important improvement and I think that another step is needed to cope with individuals' expectations.

A new positive step towards individuals' involvement: the networks

Favouring topical networking, such as ALARA networks, at all levels - within a firm or an institution, within a country or a world region - is a very efficient way of ensuring that the individual is "the" target and 'a' key partner in the risk management. Network's members participate with their own past experiences, problems they have encountered and questions they have to solve rather than as only representative of their institutions. This allows them to more easily accept differences and reach a common understanding of an appropriate way forward without forgetting the aim of an efficient global radiological protection. This more free and open-minded approach can lead to the development and wider acceptance of "benchmarks" and behaviours that would have been difficult to achieve through more formal mechanisms.

I do believe that it is not utopia: networking will be seen in the next few decades as an increasing pragmatic tool for balancing the various forces of cost reduction and regulatory conformity, with a way of taking good care of the individuals' risks, needs and hopes. Let keep the individual as the heart of the ALARA networks.

C. Lefaure
EAN Chairman
Email: lefaure@cepn.asso.fr

Coordinated by CEPN,
European ALARA Newsletter ISSN 1270-9441
c/o CEPN - 28, rue de la Redoute - F-92260 FONTENAY-AUX-ROSES
TEL: +33 1 55 52 19 20 FAX: +33 1 55 52 19 21
E-MAIL: sec@cepn.asso.fr

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ICRP's 2007 Recommendations on Radiological Protection

L-E. Holm, Chairman of ICRP

ABSTRACT

The International Commission on Radiological Protection has recently approved its 2007 Recommendations. In these Recommendations, the radiation and tissue weighting factors have been updated as well as the radiation detriment based on the latest available scientific information of the biology and physics of radiation exposure. The three fundamental principles of radiological protection, namely justification, optimisation and the application of dose limits, as well as the individual dose limits remain unchanged. The system of protection has evolved from the process-based protection approach using practices and interventions to a situation-based approach applying the fundamental principles of justification and optimisation of protection to all planned, emergency, and existing exposure situations. The principle of optimisation of protection is reinforced and is applicable to all exposure situations with restrictions on individual doses, namely dose constraints for planned exposure situations and reference levels for emergency and existing exposure situations. The Recommendations also include an approach for developing a framework for radiological protection of the environment.

INTRODUCTION

The 2007 Recommendations of the International Commission on Radiological Protection were approved by the Commission in March 2007 after several years of international discussions and consultations [1]. The Commission's extensive review of the health effects of ionising radiation has not indicated that any fundamental changes are needed to the system of radiological protection, and existing numerical recommendations in the policy guidance issued since 1991 remain valid unless otherwise stated. Therefore, the 2007 Recommendations should not imply any substantial changes to radiological protection regulations that are based on the Commission's previous recommendations and subsequent policy guidance.

The Commission judges the distribution of risks to different organs/tissues to have changed somewhat since 1990 [2], particularly in respect of the risks of breast cancer and heritable disease. However, assuming a linear response at low doses, the overall fatal risk coefficient of 0.05 Sv^{-1} continues to be appropriate for purposes of radiological protection. Embodied in this risk estimate is the continued use of a dose and dose-rate effectiveness factor for solid cancers at a value of 2. The Commission has retained the individual dose given in Publication 60 [2] but recognises that further scientific reviews and revised judgements may be required particularly in respect of the lens. The available data on excess disease other than cancer (e.g., cardiovascular disorders) are judged to be insufficient to inform on risks at low doses.

The Commission now recognises three types of exposure situations, which replace the previous categorisation into 'practices' and 'interventions' [2]. The three exposure situations are intended to cover the entire range of exposure situations:

- *Planned exposure situations,* involving the deliberate introduction and operation of sources;
- *Emergency exposure situations,* which are unexpected situations that occur during the operation of a planned situation, or from a malicious act, requiring urgent attention;
- *Existing exposure situations,* which are exposure situations that already exist when a decision on control has to be taken, including natural background radiation.

The three key principles of radiological protection are retained in the 2007 Recommendations. The principles of *justification* and *optimisation* apply in all three exposure situations whereas the principle of *application*

of dose limits applies only in planned exposure situations. The Commission continues to distinguish between three categories of exposure: occupational exposures, public exposures and medical exposures of patients.

The Commission's recommendations for radiological protection and safety in medicine are given in *Publication 73* and have been further elaborated in a series of publications. The recommendations, guidance and advice in these publications remain valid and are summarised in the 2007 Recommendations.

Other principal components of the system of radiological protection are:

- A categorisation of the types of assessments (source-related and individual-related);
- A description of the levels of individual doses that require protective action or assessment (dose limits, dose constraints, and reference levels); and
- A delineation of the conditions for the safety of radiation sources, including their security and the requirements for emergency preparedness and response.

The Recommendations emphasise the key role of the optimisation of protection, which should be applied in a similar manner in all exposure situations. Restrictions are applied to individual doses, namely dose constraints for planned exposure situations and reference levels for emergency and existing exposure situations. Options implying doses greater in magnitude than such restrictions should be rejected at the planning stage. These restrictions on doses are applied prospectively, as with optimisation as a whole. If following the implementation of an optimised protection strategy, it is subsequently shown that the value of the reference level or constraint is exceeded, the reasons should be investigated but this fact alone should not necessarily prompt regulatory action. The Commission expects that this emphasis on a common approach to radiation protection in all exposure situations will aid application of the Recommendations in the various circumstances of radiation exposure.

For the sake of continuity with its 1990 Recommendations [2], the Commission has retained the term 'dose constraint' for planned exposure situations (with the exception of medical exposure of patients). For emergency and existing exposure situations, the Commission uses the term 'reference level'. The difference in terminology between planned and other exposure situations has been kept to express the fact that the restriction on individual doses can be complied with from the beginning of the optimisation process in planned situations, while with the other situations the optimisation process may apply to levels of individual doses above the reference level. Diagnostic reference levels are already being used in the medical diagnosis (i.e., planned exposure situations) to indicate whether, in routine conditions, the levels of patient dose or administered activity from a specified imaging procedure are unusually high or low for that procedure.

The chosen value for a constraint or a reference level will depend upon the prevailing circumstances of the exposure under consideration. It must also be realised that neither of them represent a demarcation between 'safe' and 'dangerous' or reflect a step change in the associated health risk for individuals. Guidance on the selection process is provided in the 2007 Recommendations, taking account of numerical recommendations made previously by the Commission.

Emphasis on optimisation, using reference levels in emergency and existing exposure situations, focuses attention on the projected level of dose remaining after implementation of protection strategies. This expected level of dose should be below the selected value of the reference level. These exposure situations often involve multiple exposure pathways and protection strategies involving a number of different protective actions will have to be considered.

Emergency exposure situations include consideration of emergency preparedness and emergency response. Emergency preparedness includes planning for the implementation of optimised protection strategies which have the purpose of reducing exposures, should the emergency occur, to below the selected value of the reference level. During emergency response, the reference level would act as a benchmark for evaluating the effectiveness of protective actions and as one input into the need for establishing further actions.

In the case of existing exposure situations, protection strategies will often be implemented over a number of years. Indoor radon in dwellings and workplaces is an important existing exposure situation and is one where the Commission has made specific recommendations in Publication 65 [3]. Since then several epidemiological studies have confirmed the health risk from radon exposure and have generally provided support for the Commission's Recommendations on protection against radon. For the sake of continuity and practicability, the Commission retains the upper value of 10 mSv for the annual dose reference level together with the corresponding activity concentrations of 600 $Bq.m^{-3}$ for dwellings and 1500 $Bq.m^{-3}$ for workplaces. Consistent with its approach to radiological protection in the 2007 Recommendations, the Commission now recommends that national authorities should set their own national reference levels below ICRP's reference levels as an aid to optimisation of protection against radon exposures. The Commission reaffirms that radon exposure at work at levels above the national reference level should be considered part of occupational exposure whereas exposures at levels below should not.

DISCUSSION

The Commission has prepared its Recommendations after two phases of international public consultation. By following this policy of transparency and involvement of stakeholders, the Commission is expecting a clear understanding and wide acceptance of its Recommendations. The Commission recognises the need for stability in regulatory systems at a time when there is no major problem identified with the practical use of the present system of protection in normal situations.

The Commission anticipates that although the revised Recommendations do not contain any fundamental changes to the radiological protection policy, these Recommendations will help to clarify application of the system of protection in the plethora of exposure situations encountered, thereby improving the already high standards of protection.

REFERENCES

[1] The 2007 Recommendations of the International Commission on Radiological Protection. Ann. ICRP. In Press.

[2] The 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Ann. ICRP 21, 1-3 (1991).

[3] Protection Against Radon-222 at Home and at Work. ICRP Publication 65. Ann. ICRP 23, 2 (1994).

Minimal qualifications and requirements for recognition of Radiation Protection Experts and Officers Recommendations of the first EUTERP Workshop

J. van der Steen (NRG, The Netherlands)

The First EUTERP workshop was held from 22-24 May 2007 in Vilnius, Lithuania and was the first in a yearly series of workshops of the EC EUTERP Platform project [1]. The workshop was organised by NRG, the Netherlands, in cooperation with the Radiation Protection Centre (RSC) in Vilnius, Lithuania.

The aim of this particular workshop was to focus on finding a common denominator for international agreement on the qualifications for training and education and requirements for mutual recognition of Radiation Protection Experts [2] (RPEs) and Radiation Protection Officers [3] (RPOs).

The workshop organisers copied the structure of the EAN workshops, which has proven to be very successful. The workshop consisted of presentations (oral and posters) and work in small working groups. The workshop specifically addressed the results of the ENETRAP project [4], which formed the input for the discussions on key elements for harmonisation of training and education requirements for RPEs and RPOs. The Working Group discussions were based on the following four topic areas:

- The roles and qualifications of the Qualified Expert (QE) (or the RPE) and the RPO;
- The methodology for harmonization of requirements for registration;
- The requirements for mutual recognition;
- The optimal approach to training.

It can be concluded that the EAN format also worked very well in this EUTERP workshop. It was attended by 69 participants, coming from 29 countries (22 Member States, 2 Candidate States and 2 Associated States of the European Union, and 3 countries from outside the European Union), from 3 international organisations (EC, IAEA and IRPA), and from 4 international networks (EAN, RECAN[5], EFOMP[6] and CHERNE[7]). There were lively discussions, both in the plenary sessions and in the working groups. A summary of the workshop and individual presentations (papers and slides) are available to download from the EUTERP website (www.euterp.eu). Here only the recommendations are presented.

RECOMMENDATIONS

Each Working Group produced conclusions and recommendations, and gave a report back on the final day of the Workshop. The output of the Working Groups was collated to produce the formal recommendations of the Workshop, as listed below.

Recommendation 1: Definition of the QE/RPE and RPO

It is recommended that the European Commission, when revising the Directive 96/29/EURATOM, revise the definition of the QE, including the role and duties of this radiation protection professional, to reflect more accurately the provision of expert advice in particular for ALARA implementation.

It is also recommended that the European Commission include a definition of the RPO which reflects the supervisory role and duties of this radiation protection professional. The revised Directive should also place requirements on the license holder with respect to supervision and the appointment of an RPO.

Recommendation 2: Criteria for the qualification of the RPE and RPO

To support the definitions, it is recommended that the European Commission develop guidance on criteria for the qualification of the RPE and the RPO, as well as guidance on education and training of these professionals to meet the criteria. The criteria should consist of a combination of theoretical knowledge,

training and competence for practical radiation protection. Competencies and skills should be obtained by a period of on the job training followed by a period of work experience. The minimum period of OJT and work experience depends on the risk and the sector of work, but it should be common for all Member States.

Recommendation 3: The MPE in relation to the QE/RPE
The Workshop concluded that there were different views about the question whether the Medical Physicist Expert (MPE) could play the same role and have the same responsibilities as the QE (or RPE). With a view on the revision of Directive 96/29/EURATOM, it is recommended that the European Commission, in cooperation with EFOMP, set up a special group for that purpose.

Recommendation 4: Cooperation of the European Commission, IAEA and IRPA
The Workshop took notice of the cooperation between the European Commission and the IAEA in the revision process of the Directive 96/29/EURATOM and the International Basic Safety Standards, respectively. The Workshop also noticed the progress made by IRPA in the development of a definition of the RPE. The Workshop therefore invited these organisations to cooperate and agree to the extent possible on the definitions and qualifications of the QE/RPE and the RPO as mentioned in Recommendations 1 and 2.

Recommendation 5: Training material and training courses
The Workshop concluded from the results of the ENETRAP project that there exists a large variety of training material and training courses throughout the European Union, of which the quality is difficult to compare. This is believed to be caused by the lack of detail given in the syllabus in Communication 98/C133/03. On the other hand, standardised training material on a modular basis has been developed by ENETRAP and by the IAEA. It is recommended that the European Commission promote the use of standardized syllabi and training materials in order to assure the quality of E&T, and investigate a methodology for comparing training materials and courses.

It is recommended that the EUTERP Platform establishes a database of training materials and training events, with the ultimate goal of applying a quality label on such materials and events.

Recommendation 6: Elements for recognition of RPEs and RPOs
It is recommended that national authorities develop a formal recognition process of the competence of RPEs and RPOs on a sector-specific and risk-specific basis. National authorities should take into account the guidance provided by the European Commission, as mentioned in Recommendation 2.

Recommendation 7: Methodology of assessing recognition
The Workshop recommended the EUTERP Platform to draft a standardized methodology of assessing the recognition of RP professionals as a basis for future mutual recognition, based on Career Profile consisting of a description of roles and duties, education, training and work experience. This draft should be discussed by the members to give feedback on the acceptability of the methodology by the Member States. It is recommended that the results be discussed at the second Workshop of the EUTERP Platform.

The European Commission is invited to consider the means to place a duty on Member States to implement such a methodology for recognition of RP professionals from other Member States.

Recommendation 8: Work programme for the EUTERP Platform
The Workshop recommended that the Platform coordinates the drafting of suitable definitions for the RPE and RPO as an input to Recommendation 1. To this end, the members of the Platform are invited to consider the required core competencies for the RPE and RPO.

The members are also invited to

- Discuss with the national regulatory authorities the EUTERP recommended methodology for recognition of RPEs and RPOs by a combination of education, training and competence;
- Provide the EUTERP office with details of suitable training events and training materials to form the basis of a training database.

(1) The EUTERP (EUropean Training and Education in Radiation Protection) Platform project is launched by the European Commission, D.-G TREN, Unit H4 Radiation Protection, under contract No TREN/05/NUCL/S07.57653. It started on 1 April 2006 and has a duration of 36 months.

(2) The term RPE is used here for those experts in a certain country that comply with the national requirements for radiation protection experts. The term Qualified Expert (QE) is used for the expert that complies with the definition in Directive 96/29/EURATOM. RPEs may or may not comply with the definition of the QE, depending on the national systems of education and training and the national regulations.

(3) The term RPO has not been defined in Directive 96/29/EURATOM, but it is defined in the International Basic Safety Standards (IAEA Safety Series 115, Vienna, 1996) as "an individual technically competent in radiation protection matters relevant for a given type of practice who is designated by the registrant or licensee to oversee the application of the requirements of the Standards".

(4) European Network on Education and Training in RAdiation Protection. ENETRAP is a research project that is being carried out under the 6th Framework Programme of the European Commission. This project has established a training scheme for professional radiation protection experts as well as an academic Master Course in Radiation Protection for students. Furthermore, the ENETRAP project has studied the differences in the interpretation of the definition of the Qualified Expert, as defined in Directive 96/29/EURATOM, in the national legislations of EU Member, Candidate and Associated States,

as well as the differences in requirements for competences of RPEs and RPOs.

(5) Regional European and Central Asian ALARA Network

(6) European Federation of Organizations of Medical Physicists

(7) Cooperation for Higher Education on Radiological and Nuclear Engineering

Retrieval of a Fire Damaged Gauge Containing a Radioactive Source in Ireland Incident Case Study n° 22

J. Duffy, J. Madden (RPII, Ireland)

INTRODUCTION

On the 16th January 2006 the Radiological Protection Institute of Ireland (RPII) (the Regulatory Authority) learned from media reports that a fire had destroyed part of a factory situated in the midlands of Ireland. It was reported to have started on the 15th January and firemen fought throughout the night and into the next morning to contain the fire. As the company who owned the factory held a licence from the RPII for the custody and use of a gauge containing a radioactive source, plans were initiated to visit the scene.

As preparations were underway, the assistant chief fire officer for the area and a representative of the licensee contacted the RPII and requested assistance regarding the detection and retrieval of the gauge. After a brief discussion it was decided that the RPII would assist in assessing any possible radiological implications of the fire arising from possible damage to the gauge and would also assist and advise on its recovery and removal from the factory.
The gauge formed part of a Heuft fill-height detection system (Model – Basic 4) (Figure 1) and it contained a 1.67 GBq Americium-241 (Am-241) source. The system was used on a production line as part of a quality control process to determine the volume of contents in metal cans. The Am-241 source and the associated radiation detector are contained within a 'bridge unit'.

Figure 1. Heuft fill-height detection system (Model Basic 4) on the production line of the plant (pre-fire)

RPII Inspectors arrived at the factory on the afternoon of the 17th January and immediately met with representatives of the Emergency Services (fire officers and crew) and the licensee to assess the situation on the ground. The building housing the production line was gutted in the fire and all existing access routes were considered by the fire officers to be unsafe. However, the fire crew managed to cut an opening in the side of the building as close as possible to the known location of the fill-height detection system (Figure 2). This subsequently allowed safer access to the vicinity of the bridge unit.

Initial efforts focused on assessing if any contamination or damage to the integrity of the sealed source had occurred, and efforts were then concentrated on locating and removing the bridge unit from the building.

Figure 2. Portion of galvanised sidewall that was cut through by fire crew to facilitate access to the production line area

RECOVERY OPERATION – Part 1

Measurements of ambient dose equivalent rates (dose rate) were undertaken at the improvised entry location using a hand held Mini-Instruments / Thermo Electron Corporation Mini-Rad 1000 Radiation Survey Meter and a Telepole (telescopic GM Tube). A number of back-up instruments with various scales and contamination monitors were also available for use as required. No dose rates above background were measured at the improvised entry location using the hand held survey meters, and at locations 4 m distance inside the factory using the Telepole instrument. Based on these measurements the RPII Inspectors advised the fire crew to cut a pathway through the galvanized panels and other debris into the production line area.

On entering the production line area the remnants of the fill-height detection system were identified (Figure 3). The environment in the area around the remains of the level system was completely destroyed and the array of galvanized metal and debris made access and working conditions very difficult. The bridge unit was located at the base of the fill height detection system. As no dose

rates above background were detected using the hand held instruments the bridge unit was removed by a fire officer for closer inspection (see Figure 4).

Figure 3. Remnants of the Heuft fill-height detection system

Once outside the building further measurements and wipe tests were undertaken on the surface of the bridge unit. No levels above background were detected using the field contamination monitor (Berthold LB 1210 B). The wipes which were analysed the next morning by the RPII's Measurement Services confirmed that no traces of Am-241 were present.

Given the damage to the unit it wasn't possible to confirm the presence of the source and it was considered necessary to send photographs (Figure 4) to the manufacturer in England (Heuft UK) for their assessment of the bridge unit. Heuft UK advised that the source block was missing from the bridge unit and provided a description of the source block to facilitate the recovery operation.
A second recovery operation was then arranged. In the interim the building was secured by the licensee and the fire crew.

Figure 4. Damaged bridge unit being surveyed outside the building

RECOVERY OPERATION – Part II

Once the production line area was confirmed as being relatively stable, an RPII Inspector along with the licensee's radiation protection officer entered the building through the opening created earlier in the week by the fire crew. They were suitably attired and equipped with Electronic Personal Dosimeters, TLD's, Finger TLD's and radiation survey meters. A small stepladder made access to the remains of the production line area easier, and the ground directly beneath their feet was scanned with a contamination monitor prior to dismounting from the bottom rung of the ladder.

The floor in the production line area was covered in debris, and after, scanning with the contamination monitor, items of debris were sifted through using a long handled tweezers and then set aside if no radiation was detected above background. At a location close to the fill-height detection system the contamination monitor registered a deflection of 300 cps (background 6 cps) and a metal component was recovered (Figure 5). This component was set aside and the surrounding area scanned to determine if there had been any contamination or leakage. No readings above background were detected.

The component was removed from the building for further examination. A dose rate of approximately 10 μSv/hr was detected at the front face, and approximately 2-3 μSv/hr at the rear face, and it was therefore assumed to be the missing source housing. On further inspection the shutter mechanism was identified and, although loose, it was confirmed to be closed. Wipes were taken of all exposed surfaces. No contamination was found on the wipes using the contamination monitor. The wipes were subsequently given to the RPII Measurement Services for analysis, which confirmed that there was no contamination present and therefore no leakage from the source had occurred.

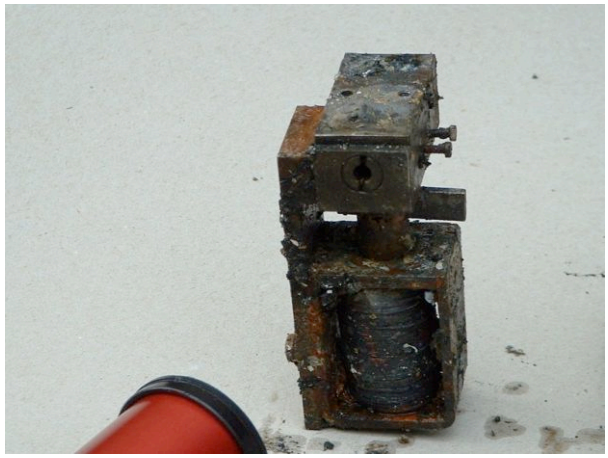


Figure 5. Front view of the recovered component which included the source block containing the Americium-241 source.

With the component pointing away from all personnel the RPII Inspector opened the shutter with a long handled tweezers and the measured dose rate reached approximately 200 μSv/hr. This confirmed that the recovered component was in fact the Am-241 source contained within its protective housing.

The shutter was fixed in a closed position and the component was put in a secure metal container. This container was labelled as containing radioactive material and placed in secure storage on site along with the previously recovered bridge unit. Dose rates around this container were less than 1 μSv/hr.

The licensee is storing the device until arrangements for its disposal with Heuft or its agents can be made.

FINDINGS

The metal source block and the metal bridge unit used by Heuft in this model of fill-height gauge are very robust as they survived a significant fire (estimated to be greater than 1000 ºC for several hours), and prevented any leakage or contamination of the source.

However, this incident has identified one potential flaw in the safety design of this model of Heuft fill-height gauge. The mounting plate which holds the Am-241 source block inside the bridge unit is made of aluminium, and during this fire the mounting plate melted which resulted in the source block detaching from the bridge unit and falling out onto the floor.

The metal radiation warning labels riveted to the outside of the bridge unit were also destroyed in the fire. These labels were subsequently found to be located on the detector end of the bridge unit rather than the source end.

LESSONS LEARNED AND ACTIONS TAKEN

This incident highlights the importance of involving the manufacturers of measurement systems containing radioactive sources at an early stage. In this case the information provided by Heuft UK was instrumental in recovering the source.

The manufacturer, the RPII and other licensees with a similar fill-height detection system have consulted on the findings of this incident and the aluminium mounting plate in all units has been replaced by one made of stainless steel. Heuft UK has also indicated that all fill-height detection systems being currently manufactured now have a stainless steel mounting plate.

The question of fire proof radiation warning labels and engraved trefoil signs is being pursued by Heuft UK.

All licensees in Ireland with fill-height detection systems, irrespective of the manufacturer or model have also been advised of the findings from this incident and asked to incorporate them into their Safety Plans and / or to contact their manufacturers for further advice.

Analysis of a Radiological Incident during Treatment of a Breast Cancer in Germany Incident Case Study n° 23

Uwe Haeusler (BfS, Germany)

LEGAL PROVISIONS

General provisions for the exposure of patients to radiation are laid down in the Radiation Protection and the X-Ray Ordinances. Detailed requirements are given in the Guideline Radiation Protection in Medicine. Here the responsibilities of the medical practitioner, the medical physics expert and paramedical personnel are specified, in particular concerning dose prescription, therapy planning and application of radiation to the patient. In case of any unusual event, the radiation protection officer has to immediately inform the competent authority.

INCIDENT SUMMARY

In 2004, a patient was overexposed during treatment for breast cancer. The incident was discovered two weeks after the end of the radiation treatment, when the patient experienced severe skin reactions.

Three medical practitioners were involved in the treatment of this patient and some of the changes in the treatment were not coordinated within the medical team. The patient received a complex treatment at an electron linear accelerator that covered seven fields and intended a total energy dose of 50 Gy in the target volume. A proper field simulation took place on two days before the therapy began. Due to lack of information, the team from the second day did a wrong field simulation, which was erroneously verified by a medical practitioner. Consequently, the patient received a dose significantly higher than intended.

After the patient worried about difficulties in breathing and skin burns on her back, fibrotic changes of the lung were found it was discovered that she had been overexposed. The wound on the back disappeared some months later.

The authority was immediately informed about the incident. As a result of several examinations, the medical practitioners were instructed:

- To improve internal communication and documentation of the treatment planning; and
- To verify treatment parameters more often during the different stages of treatment.

DOSE TO THE PATIENT

The overexposure of the patient could not be investigated precisely afterwards. The additional dose in a worst-case scenario was estimated to be about 90 Gy, but the observed injuries indicated, that the real overexposure was significantly lower. It was assumed, that the patient received about double the intended dose.

LESSONS LEARNED

Precise documentation, measures for training of personnel, and an overall quality assurance system have to be implemented in the working practice of radiotherapy. Additional control steps to verify the treatment procedure should be established on a random basis, accompanying the course of the therapy. In order to enforce these requirements, every state authority, that issues licenses for radiotherapy, has to prove, that the licensee complies with these requirements.

Finally, every person involved in radiotherapy procedures should be aware of the responsibility that is necessary for a proper treatment of patients.

ALARA NEWS

❑ EURADOS WG2 and EU-Trimer

European Radiation Dosimetry Group (EURADOS) stimulates collaboration between European laboratories in the field of dosimetry of ionizing radiation. More than 250 scientists from about 80 laboratories have contributed to its activities. In this framework EURADOS Working Group 2 (WG2) has contributed for more than 10 years to the Harmonizing of Individual Monitoring in Europe.

Following the European Commission Directorate General Transport and Energy (EC- DGTREN) call for tender entitled "Establishment of European Technical Recommendations for Monitoring Individuals Exposed to External Radiation" (No TREN/H4/98-2006), EURADOS WG2/SG1 prepared a proposal that was submitted to EC-DGTREN jointly by a Consortium of the Greek Atomic Energy Commission (GAEC) and EURADOS.

In February 2007 notice of the success of the proposal was received and the relevant contract was signed between EC DGTREN and GAEC in April 2007. The project is named EU-Trimer.

The main objective of EU-Trimer is to draft new European Technical Recommendations for Monitoring Individuals Occupationally Exposed to External Radiation, according to the most recent scientific and technical knowledge; the recommendations, reports, guides and standards issued by international organizations; the experience and lessons learned from 12 years use of EUR14852; and the opinion and experience of the relevant organizations (authorities, individual monitoring services, calibration laboratories) in the European Union member, candidate and associate States. The input from international and European organizations and networks is crucial for the success of the project. The interaction of EURADOS WG2 members with EAN and its members in the different countries will be a valuable contribution.

EU-Trimer is composed of 6 working packages. The organizational scheme includes the project task group, made up of seven experts in the field of individual monitoring and the WG2 members that will act as contact persons for their respective countries in order to provide and disseminate the information needed.

EU-Trimer has a duration of 24 months and its final task will be the presentation of the new document to the Group of Experts established under Article 31 of the EURATOM Treaty for approval.

The next in the series of Individual Monitoring Workshops usually organized by EURADOS might be the first opportunity to officially introduce the new European Technical Recommendations for Monitoring Individuals Occupationally Exposed to External Radiation.

Contact: V.Kamenopoulou, GAEC, vkamenop@gaec.gr

❑ 1st Workshop of the European ALARA Network for NORM

The European ALARA Network for Naturally Occurring Radioactive Materials is organising its 1st workshop in Dresden (Germany) from November 20 to 22, 2007.

The workshop provides a forum for different stakeholders (scientific, technical, regulatory, etc.) involved in the ALARA Network for NORM issues. This first workshop will be devoted to the dissemination of knowledge on good radiation protection practice concerning NORM industry and other work activities.

The main topics, which will be discussed during the workshop, are:

- Aims, objectives, scope and content of the European ALARA Network for NORM and the approach to its further design,
- Experience in the assessment of the internal and external exposure from natural radionuclides at work,
- Experience in the execution of radiation protection legislation in the NORM industry of the Member States,

- Necessity for additional radiation protection regulations according to the ALARA principle especially for NORM.

More information can be found on the network's Web Site: http://www.ean-norm.net

❑ ISOE European Symposium on Occupational Exposure Management at Nuclear Facilities

The European Technical Centre of the international Information System on Occupational Exposure (ISOE) and the International Atomic Energy Agency (IAEA) are jointly organising the 2008 ISOE European Symposium, which will be held in Turku (Finland), from 25th to 27th June 2008. The OECD Nuclear Energy Agency (NEA) co-sponsors this Symposium.
The main aims of the Symposium are:

- To provide a large forum of information exchange on occupational exposure concerns (practices, management and procedures, dose results and reduction, improvement of techniques and tools, etc.), and
- To allow vendors to present their recent experience and developments in radiation protection (measurement techniques, operating and plant design improvements, ALARA practices during operation and outages, etc.) in a commercial exhibition.

The Symposium will provide an opportunity for the participants to take part in plenary sessions, and presentations of posters. Visits of the construction of the new Finnish EPR at TVO NPP, of the VLJ (repository for low and intermediate level of radioactive waste) and of ONKALO (underground research facility being built for rock characterisation for the final disposal of spent nuclear fuel) will be organised on the last day of the Symposium.

Abstracts for oral and/or poster presentation must be submitted by the 17th of December 2007.

More information and call for papers can be found on the ISOE's Web Site: http://www.isoe-network.net.

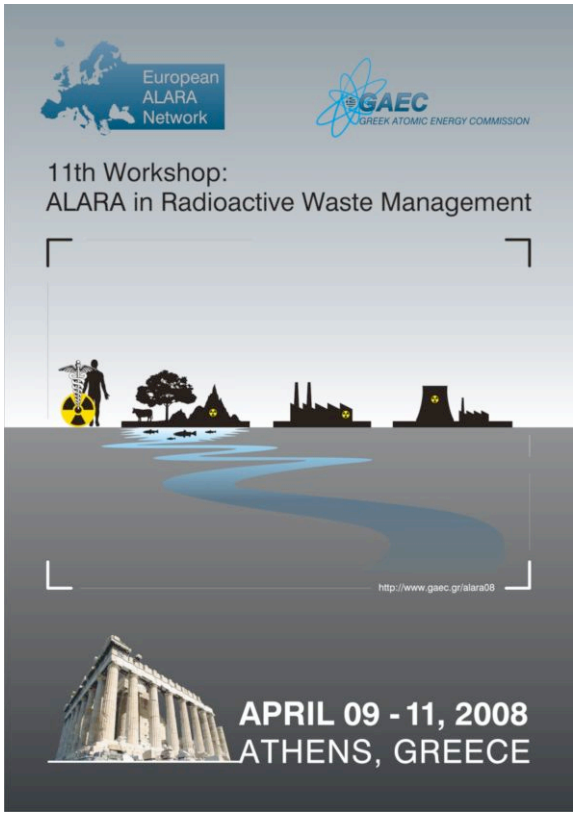
Contact person: Lucie D'Ascenzo
Phone: + 33 1 55 52 19 28
Email: lucie.dascenzo@cepn.asso.fr

❑ 12th International IRPA Congress – Call for Papers

The 12th International Congress of the International Radiation Protection Association will take place in Buenos Aires (Argentina) from October 19 to 24, 2008.

Abstracts for posters and/or oral presentations can be submitted until the 1st of December, 2007.

More information can be found on the congress' Web Site: http://www.irpa112.org.ar.



11th European ALARA Network – 'ALARA in Radioactive Waste Management'

Athens (Greece) – 9-11 April 2008

Objective

The aim of the 11th EAN Workshop is to focus on the implementation of the ALARA principle with regard to occupational and public exposures arising from the management of radioactive waste. This includes waste from the nuclear, medical, NORM, industrial, education and research sectors.

As with previous workshops, this workshop will consist of presentations (oral and posters) intended to highlight the main issues, and a significant part of the programme will be devoted to discussions within working groups. From these discussions, participants will be expected to produce recommendations on ALARA in Radioactive Waste Management addressed to relevant local, national and international stakeholders.

Scope of the Workshop

The workshop programme will include the following subjects:

- Introduction and scene setting:
  - An overview of the current policies, strategies and regulations on waste management at the international and national levels, and how these take into account the ALARA principle.
  - The optimisation principle versus dose minimisation principle.
- Application of the ALARA principle:
  - How to deal with collective dose (dose bands, truncation, etc.)?
  - Public doses and worker doses - a balancing act?
  - What is the role of decision-aiding techniques (cost-benefit analysis, etc.) in the 21st century?
  - How do re-use, recycling and disposal (dilution and dispersion versus concentration and containment) fit with the ALARA principle?
- Stakeholder involvement:
  - How are different types of stakeholders involved in making waste management choices?
  - What are the different approaches in different European countries?
  - How does public perception influence decisions for management of waste containing artificial or natural radionuclides?
- Practical experience in applying ALARA to waste management in different sectors:
  - Nuclear industry
  - Medical
  - NORM
  - Others (industry, research, education, radioactive consumer products, etc.)

Working Group Topics

- Dealing with doses – how to take account of different dose distributions, worker and public doses, doses over long timescales, etc.
- How should ALARA be applied and implemented in the areas of re-use, recycling and disposal of radioactive waste?
- Why should different strategies be applied to the different sectors and what should these differences be?
- What are the main criteria that should be used for decision-making in the management of radioactive waste?

Target Audience

The workshop should be of interest to a variety of stakeholders including regulatory bodies, waste producers and processors, research and other organisations with an interest in radioactive waste management and radiation protection.

The number of participants will be restricted to a maximum of 80. The workshop will take place at GAEC premises, near Athens, starting on the morning of Wednesday 9th April and finishing midday on Friday 11th April, 2008.

Fee

The attendance fee will be **400** €.

More information on the Workshop Web Site: http://www.eeae.gr/alara08

The 20 EUROPEAN ALARA NETWORK Contact Persons

- **AUSTRIA**
Mr Thomas GERINGER
Austrian Research Centers Seibersdorf, Department of Medical Physics A-2444 SEIBERSDORF
Tel: +43 50550 3030; Fax: +43 50550 3033
E-mail: thomas.geringer@arcs.ac.at

- **BELGIUM**
Mr Fernand VERMEERSCH
SCK/CEN, Boeretang 200, B-2400 MOL
Tel: +32 14 33 27 11; Fax: +32 14 32 16 24
E-mail: fvermeer@sckcen.be

- **CROATIA**
Mr Mladen NOVAKOVIC
Radiation Protection, EKOTEH Dosimetry,
Vladimira Ruzdjaka 21, 10000 ZAGREB
Tel: +385 1 604 3882; Fax: +385 1 604 3866
E-mail: mlnovako@inet.hr

- **CZECH REPUBLIC**
Mr Jan KROPACEK
SUJB - State Office for Nuclear Safety,
Syllabova 21, CZ-730 00 OSTRAVA
Tel: +420 596 782 935; Fax: +420 596 782 934
E-mail: jan.kropacek@sujb.cz

- **DENMARK**
Mr Jens SØGÅRD-HANSEN
Danish Decommissioning
Fredriksborgvej 399, DK-4000 ROSKILDE
Tel: + 45 46 77 43 03; Fax: + 45 46 77 43 43
E-mail: jens.soegaard@dekom.dk

- **FINLAND**
Mrs Maaret LEHTINEN
STUK – Radiation Practices Regulation
Laippatie 4, FIN-00880 HELSINKI
Tel: +358 9 75988244 Fax: +358 9 75988248
E-mail: maaret.lehtinen@stuk.fi

- **FRANCE**
Mr André JOUVE
ASN, 10, Route du Panorama
F-92266 FONTENAY-AUX-ROSES CEDEX
Tel: +33 1 43 19 70 62 ; Fax: +33 1 43 19 70 69
E-mail: andre.jouve@asn.fr

- **GERMANY**
Mrs Annemarie SCHMITT-HANNIG
BfS, Ingolstädter Landstrasse 1,
D-85764 OBERSCHLEISSHEIM
Tel: +49 1888 333 2110; Fax: +49 1888 333 2115
E-mail: schmitt@bfs.de

- **GREECE**
Mrs Vassiliki KAMENOPOULOU
Greek Atomic Energy Commission (GAEC)
P.O. Box 60092, 15310 AG-PARASKEVI, GREECE
Tel: +30 210 6506731; Fax: +30 210 6506748
E-mail: vkamenop@gaec.gr

- **ICELAND**
Mr Guðlaugur EINARSSON
Geislavarnir Ríkisins, Rauðararstigur 10
150 REYKJAVIK, ICELAND
Tel: +354 552 8200; Fax: +345 552 8202
E-mail: ge@gr.is

- **IRELAND**
Mr Stephen FENNELL
Radiological Protection Institute of Ireland,
3 Clonskeagh Square, Clonskeagh Road, DUBLIN 14,
Tel: +353 1 206 69 46; Fax: +353 1 260 57 97
E-mail: sfennell@rpii.ie

- **ITALY**
Mrs Serena RISICA
ISI – Technology and Health Department
Viale Regina Elena 299, I-00161 ROME
Tel: + 39 06 4990 2203; Fax: +39 06 4938 7075
E-mail: serena.risica@iss.it

- **THE NETHERLANDS**
Mr Jan VAN DER STEEN
NRG Arnhem, Utrechtseweg 310, P.O. Box 9035,
NL-6800 ET ARNHEM
Tel: +31 26 3568570; Fax: +31 26 4423635
E-mail: vandersteen@nrg-nl.com

- **NORWAY**
Mr Gunnar SAXEBØL
Norwegian Radiation Protection Authority, Grini
Naeringspark 13, Postal Box 13, N-1345 ØSTERÅS
Tel: +47 67 16 25 62; Fax: +47 67 14 74 07
E-mail: gunnar.saxebol@nrpa.no

- **PORTUGAL**
Mr Fernando P. CARVALHO
Instituto Tecnologico e Nuclear
Estrada Nacional 10, P-2686-953 SACAVEM
Tel: +351 21 994 62 32; Fax: +351 21 994 19 95
E-mail: carvalho@itn.mces.pt

- **SLOVENIA**
Mr Dejan ŽONTAR
Slovenian Radiation Protection Administration
Langusova 4, SI-1000 LJUBLJANA
Tel: +386 1 478 8710; Fax: +386 1 478 8715
E-mail: dejan.zontar@gov.si

- **SPAIN**
Mrs Carmen ALVAREZ
CSN, Justo Dorado 11, E-28040 MADRID
Tel: +34 91 346 01 98; Fax: +34 91 346 05 88
E-mail: cag@csn.es

- **SWEDEN**
Mrs Birgitta EKSTRÖM
SSI - Swedish Radiation Protection Authority,
S-171 16 STOCKHOLM
Tel: +46 8 729 7186; Fax: +46 8 729 7108
E-mail: birgitta.ekstrom@ssi.se

- **SWITZERLAND**
Mr Nicolas STRITT
Swiss Federal Office of Public Health, Radiation Protection Division, CH-3003 BERN
Tel: +41 31 324 05 88; Fax: +41 31 322 83 83
E-mail: nicolas.stritt@bag.admin.ch

- **UNITED KINGDOM**
Mr Peter SHAW
HPA – Health Protection Agency, Occupational Services Dept., Radiation Protection Division
Hospital Lane, Cookridge, LEEDS – LS166RW
Tel: +44 113 267 9629; Fax: +44 113 261 3190
E-mail: peter.shaw@hpa.org.uk