European ALARA Network

EAN Steering Group Meeting
18th December 2012

ALARA NEWS AND ALARA INFORMATION IN EAN MEMBERS COUNTRIES

This document summarized the main events dealing with ALARA in EAN Members countries discussed at the occasion of the 18th December 2012 Steering Group meeting.

BELGIUM – F. VERMEERSCH (SCK/CEN)

Incidents

1. In October 2012 a person entered a safety perimeter around a x-ray apparatus (65 kV-1.8 mA) and was overexposed on the hands. Based on a reconstruction of the incident a maximum dose between 5 and 10 Gray was calculated. However no skin burns on the hands was detected. A medical follow up of the irradiated person is performed. Activities are stopped until corrective actions are put in place.

2. In September 2012 an operator was exposed on entering a bunker with gammagraphy equipment still switched on. The electronic personnel dosimeter indicated 948 mSv, the TLD dosimeter indicated 1.4 mSv. No direct effect of radiation was found during the medical examination of the person. A further medical follow up is organised.

3. In April 2012 a 2 GBq ^{137}Cs source was found by scrap dealer. The source was located and then removed to a waste depositary site.

4. Flaws were detected in the reactor vessel of two reactors in Belgium. An investigation is currently being done to evaluate the importance of these flaws for the safe operation of the reactors. □

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FRANCE – O. GUZMAN (ASN)

General topics

Pierre-Franck Chevet is appointed ASN Chairman & Margot Tirmarche is appointed ASN Commissioner

Pierre-Franck Chevet has been appointed Chairman of ASN by decree of the President of the Republic dated 9 November 2012, for a period of 6 years. He succeeds André-Claude Lacoste who was appointed Chairman of ASN in 2006 and whose mandate expires on 12 November 2012.
Margot Tirmarche has been appointed ASN Commissioner by decree of the President of the Republic dated 9 November 2012, as the member designated by the President of the National Assembly, for a period of 6 years. She succeeds Marie-Pierre Comets, appointed ASN Commissioner in 2006 and whose mandate expires on 12 November 2012.

Medical & industrial activities

Quarterly report of ASN/SFRO level 1 radiotherapy events reported during third quarter 2012

Thirty three events, classified as level 1 on the ASN-SFRO scale, were reported between 1 July and 30 September 2012 Although these events are not expected to have any impact on patients' health, they are analysed to see if any lessons can be learnt from them (particularly as regards organisation) and to avoid any recurrence.

The thirty-three events have concerned one single patient. Four events occurred during brachytherapy treatment. Most of the events (18/30) have caused an unattended exposure in one area of the patient not expected to be irradiated due to an errors in patient positioning. Six events have concerned an error in patient identification, 4 events concerned dosage error and 5 events due to an error in beam positioning.

ASN investigates level 1 events during specific inspections or during its regular inspections of radiotherapy centres.

ASN recalls of industrial radiography regulation to all operators

ASN considers a worrying trend the increase in the number of incidents in industrial radiography observed in the past recent years. These incidents often originate from the blocking of the radioactive source in the ejection tube. This position of the source outside the safety position prohibits direct human intervention given due to the very important dose rates in the surroundings of the equipment. They most often require the intervention of deported means and / or robots to secure the radioactive source. The number of recent incidents due to source blocking is a warning signal to ASN.

This increase reveals a lack of radiation protection culture and a lack or risk awareness by the operators of industrial radiography. In this context ASN has addressed a circulaire letter to all operators, reminding them of the rules and calling for improvements in the preparation of the work and the management of incidents, mostly related to source blocking. ASN plans reinforcing regulations in this field and points out that alternative method exists and should be considered. Industrial radiography is a priority issue in radiation protection for ASN which carries out each year more than 100 inspections in this sector.

Issue # 3 of ASN Publication "Patient Safety" released

ASN has published in July 2012 the issue #3 of its publication "Patient safety" addressed to professionals. This issue is devoted to present the most used methods of analysis of significant events used by radiotherapy centres in France. A presentation by ASN on these publications will be made on the occasion of the upcoming EAN meeting on 18 December 2012: *"Patient safety - Paving the way for progress": bulletins for radiotherapy professionals edited by ASN in the framework of the multidisciplinary work group with professionals from radiation therapy dedicated to experience feedback"*

Natural radiation

ASN publishes the 2011-2015 national action plan for the management of radon risk

The 2011-2015 national action plan for the management of radon risk is now available in English on ASN website:
http://www.french-nuclear-safety.fr/index.php/English-version/News-releases/2012/ASN-s-national-action-plan-for-management-of-the-radon-risk
For more information about this action plan, see ALARA News for 2012 first semester.

CODIRPA.- Nuclear post-accidental phase management

ASN publishes the first elements of a national doctrine for nuclear post-accidental phase management

Under a mandate given by a ministerial directive, ASN has developed and leaded from 2005 to 2012, a steering committee to establish a doctrine for the management of the post-accidental phase of an accident Nuclear or of a radiological emergency (CODIRPA), with the active participation of various stakeholders, including the main departments concerned, the expert bodies such as IRSN and InVS, associations, elected and operators of nuclear facilities, and involving international expertise.

The elements of the first national doctrine have been established considering nuclear accidents involving radioactive releases of short duration (less than 24 hours). These elements constitute in itself an original contribution internationally to the extent that they cover the entire post-accident phase: the first days after radioactive releases, the first months (so-called transition period) and the first years after accident (long-term period). In particular, they aim at three inseparable objectives:

- protecting the population against the dangers of ionizing radiation;
- providing support to people affected by the consequences of the accident;

- recovering the territories affected the economic and social development

In agreement with the different stakeholders involved in the work of CODIRPA the report containing the doctrine has been posted on the website of the ASN, as well as all technical reports prepared by the CODIRPA and transmitted to the Government by ASN.

In the notice accompanying this publication [2] ASN draws the Government's attention to the fact that the publication of the first elements of the national doctrine is an important first step in preparing for the post-accident management but that it must be continued and intensified to allow ownership by stakeholders, particularly at regional level. Finally, ASN has proposed the Government to continue to provide assistance to the public authorities to continue preparing for the post-accidental management of a nuclear accident but also to update the first elements of the national doctrine, in particular taking into account the feedback from the Fukushima accident

Research

ASN Opinion on the importance of research to ASN and on identifying the first research topics to be further investigated

The basis for decision making at ASN depends primarily on sound technical expertise, supplied by TSOs, in particular IRSN and the advisory Committees. This expertise is itself backed by a strong scientific and technical knowledge.

As a result, ASN is very interested, like its foreign counterparts, in availability of the knowledge base required to make the important regulatory decisions over the next five, ten or twenty years. So, it is important for the organisation to identify the research areas which contribute to the acquisition of such a knowledge base.

Recognising the work initiated four years ago, especially with the creation in 2010 of ASN Scientific Committee, ASN has approved the first ASN Opinion on the importance of research to ASN and on identifying the first research topics to be further investigated in the fields of nuclear safety and radiation protection.

The topics identified concern the four areas previously identified by its scientific Committee:

- social, organizational and human factors;
- radiobiology;
- ageing of metal materials used in pressurized-water reactor (PWR) ;
- non-destructive examination

ASN wishes that these needs are taken fully into account when defining the guidelines for nuclear safety and radiation protection research undertaken by IRSN, by operators, by other French key players in research (universities, manufacturers), and also in European projects in order to continue to increase nuclear safety and radiation protection in France and the world. □

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GERMANY – A. SCHMITT-HANNIG (BFS)

Status of the Euratom Basic Safety Standards

The draft is being discussed since months in a technical Working Group of the Council. Specific topics are, for example, a new control system of the RP authorities, medical – non-medical exposures, radon, building materials, etc.
In principle, the draft is appreciated, however, there are some issues which need to be checked, for example:

- requirements related to emergency preparedness: practical implications;
- independency of competent authorities.

Some issues are particularly appreciated, for example:

- determination of consistent exemption levels and clearance levels on the basis of the IAEA recommendations with some flexibility for national arrangements;
- inclusion of security aspects of radiation sources (EU action plan on chemical, biological, radiological and nuclear (CBRN) security, which provides an all-hazard approach focusing on the prevention and detection of, as well as preparedness and response to, CBRN threats;
- strengthening of radiation protection in medicine, in particular the introduction of a legal framework for the application of ionising radiation for early detection of diseases in individuals;
- harmonisation of the requirements for a European radiation passport.

On the other hand, the draft contains requirements which will be difficult to transpose, for example:

- the requirement to include more sources of exposures for the dose limit of the population incl. NORM and exposures from non-medical imaging ;
- determination of dose constraints.

Some requirements are refused, for example:

- the commitment to identify radon prone areas and to carry out radon measurements at work places in basements (more flexibility is required)
- consideration of well-being as criterion for justification issues in medicine
- requirements for the protection of the environmental (in particular since present scientific knowledge is not sufficient to derive practical regulations)
- extensive reporting duties to the EC.

International Conference on Radiation Protection in Medicine organised by the IAEA and hosted by the German government represented by BMU (3-7 December 2012 in Bonn): Justification, optimisation and risk minimisation are the three pillars for determining actions in medical radiation protection.

Revision of the Guideline „Radiation Protection in Veterinary Medicine“

Activities of Heads of European Radiation Protection Authorities (HERCA)
a) HERCA-WG 1 – European Radiation Passport
b) HERCA-WG 3 - Medical Applications

Protection of the eye lens: new developments

The future implementation of the limit of 20 mSv per year in the draft EURATOM BSS needs a strategy starting with the awareness of the user. In particular in clinics, radiation protection awareness is growing. In a second step, the dosimetric surveillance of exposed workers is envisaged. A problem is the marginal difference to the dose limit for the public (still 15 mSv per year).
Affected work places can be found in interventional radiology, where it will be difficult in some cases to comply with the new limit, even when utilising all technical possibilities.

Use of sealed radiation sources marginally below HASS level for training purposes (fire fighters): training centre asking for a license for a Cs-137 radiation source with an activity of 18,5 GBq.

Handbook on HASS Sources

With the aim to technically support users of High Activity Sealed Sources (HASS) as well as staff of competent authorities when using the central radiation sources register; BfS has issued a user handbook explaining the legal, radiological and technical framework for handling HASS sources.
The central register is in operation since 2007 on a routine basis. The status in September 2012: more than 112 representatives of 54 authorities and 600 licensees are using the system which contains to date more than 25.000 HASS sources. □

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GREECE – S. ECONOMIDES (GAEC)

Training of outside workers on radiation protection

The Greek Atomic Energy Commission (GAEC) organized in November 2012 two training seminars exclusively addressed to outside workers participating in activities taking place in control areas of medical facilities of ionizing radiation.

The 8-hour seminars covered a wide range of topics, such as basic principles of ionizing radiation, biological effects, dosimetric quantities, as well as legal requirements regulating the employment of outside workers. Moreover, the seminars focused on the practical aspects of radiation protection for radiological, nuclear medicine and radiotherapy applications and underlined the importance of safety culture development.

The seminars were organized in Athens and were attended by 46 participants. The participants evaluated the topics covered, the quality of the lectures given and their usefulness, providing quite encouraging feedback. Therefore, GAEC's intention is the repetition of the seminars in Thessaloniki, in order to allow the outside workers from the northern part of Greece to attend.

The organization of these seminars is in line with one of GAEC's mission basic components, the provision of continuous training, as well as in accordance with radiation protection optimization requirements of the Greek legislation. □

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IRELAND – S. FENNEL (RPII)

Radiological Protection Institute of Ireland to be merged with the Environmental Protection Agency

On 31st October the Government announced that the Radiological Protection Institute of Ireland and the Environmental Protection Agency were going to be merged as part of programme of rationalisation of state agencies under the Public Service Reform Plan which was launched in November 2011.

New Approval Requirements for Dosimetry Service Providers

From 1 January 2013 dosimetry services providing a service in Ireland pursuant to S.I. No. 125 of 2000 must be approved by the Radiological Protection Institute of Ireland (RPII).

The purpose of approval is to ensure that a dosimetry service is technically competent and can assess doses with a reasonable degree of accuracy. In order to be approved, the dosimetry service must satisfy criteria based on the European Commission's technical 2009 recommendations for monitoring individuals occupationally exposed to external radiation [RP 160]. These recommendations provide a basis for developing consistent and harmonised approval criteria for dosimetry services operating in all Member States and are intended to promote common European standards for such monitoring.
A list of approved dosimetry services (ADS) will be maintained on the RPII website (www.rpii.ie).

New report on Risks to Ireland from the UK Sellafield Site

The Department of Environment, Community and Local Government has released the summary of a report prepared by an independent team of international experts which assesses the probable risks to Ireland from incidents at the Sellafield reprocessing site. The Report concluded that incidents at the Sellafield site resulting in the release of radioactive material would result in "no observable health effects in Ireland

A summary of the report can be downloaded at

http://www.environ.ie/en/Publications/Environment/EnvironmentalRadiation/FileDownLoad,31607,en.pdf

Public awareness campaign in the high radon county of Wexford

In November a week long radon awareness campaign was held in County Wexford in the southeast of Ireland. It is estimated that one in six homes in this county have radon concentrations above the National Reference Level of 200 Bq/m^3. The purpose of the

campaign was to raise awareness among homeowners of the health risk from exposure to radon gas and to encourage measurement and, where necessary, remediation. The campaign was coordinated with and endorsed by the local authority, the Department of Environment and the Health Services Executive (the national public health body).

The campaign included posting an information pack to every home in the county (over 60,000), holding public meetings and briefing local and national politicians. Local community and business groups were also briefed and advertisements were run on local radio and in local papers. Press releases were issued during the week and the RPII's website, FaceBook and Twitter were used to further promote the campaign. The response to the campaign was good with an increase in the number of queries, and applications for radon measurements. Eleven articles were published in local and national papers; eight local and national radio stations broadcast the news and many of these interviewed RPII staff.

Information on www.rpii.ie about the campaign and press releases issued:

http://www.rpii.ie/Your-Home/Radon-Awareness-Campaigns/Wexford-Radon-Week-Nov-2012.aspx
http://www.rpii.ie/Site/Media/Press-Releases/Wexford-Radon-Week.aspx
http://www.rpii.ie/Site/Media/Press-Releases/Public-meetings-held-on-the-dangers-of-radon-gas-i.aspx

Radioactive waste programme

Ireland does not have a national storage facility to assist in the management and storage of disused sources as well as those that are occasionally discovered – the so called 'orphan' sources. The RPII has long identified the lack of such a facility as a serious gap in the current waste management infrastructure with potential implications for safety and security. In response to these concerns, in December 2010 the Government adopted a national policy on radioactive waste management for Ireland. One of the key initiatives under this policy is that the inventory of disused radioactive sources should be reduced through a co-ordinated and phased Inventory Reduction Programme. Work on this programme commenced in 2012 and is already yielding significant reductions in the numbers of sources held by licensees, particularly in the third level educational and the state sectors, with thousands of disused sources successfully being sent to facilities in the UK, USA and Germany for final disposal,.

The new policy also provides for the establishment of a centralised storage facility for interim storage and management of residual sources and this initiative will be progressed once the final inventory of sources is categorised following the completion of the reduction programme. The Government has also agreed an operational protocol for seized and orphan sources which sets out responsibilities for RPII, Government departments and key stakeholders to ensure that these sources are dealt with in a safe and secure manner. □

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ITALY – S. RISICA (ISS)

In the past years the SENTINEL project, one of the most important surveys on *Interventional Radiology* in Europe, highlighted the increasing number of procedures annually performed in the European countries and the high variability of both the performance of X-ray equipments and the dose to patients and operators.
Within the Strategic Program *Safety and Health Technologies,* in 2010 the Italian Ministry of Health funded a project[1] to investigate the doses to patients and workers in interventional radiology and to improve the knowledge of the technology used and its general performance.
As a first step, information has been gathered about the protocols used in different Centres for monitoring the dose to patients and operators. Data have been also collected on the performance of radiological equipment in terms of image quality, protocols of use of the angiographic equipment and existence of trigger levels for the prevention of skin damage. The ultimate goal is to define a first set of recommendations to improve the level of radiation protection of staff and patients in Italy. The survey will also help identify the level of awareness of operators and will suggest a better training of workers.
This is an important initiative - even if at present only at study level - to apply the ALARA principle in a field where doses to both workers and patients are of concern. First results were presented recently at the Italian Conference of the Radiation Protection Association (S. Grande, C. De Angelis, A. Palma, P. Fattibene, R.Padovani, A.Trianni, A.Negri, F.Bonutti. *A methodology to assess optimisation levels of patient and staff exposures in interventional radiology in Italy.* In: AIRP - Atti del XXXV Congresso Nazionale di Radioprotezione, Venezia, 17 - 19 ottobre 2012. ISBN 978-88-88648-35-4).

Following the recommendations of the International Commission on Radiological Protection, great attention is being given to the news about the risks that ionising radiations pose to the eye lens. Several initiatives were taken in Italy to inform radiation protectionists, physicians, operators, etc. A workshop was organised by the Italian Radiation Protection Association (Milan, May 2012); a lecture was given at its National Annual Conference (Venice, October 2012); another two-day workshop (Rome, October, 2012) was organised by the professional association of qualified experts in radiation protection (ANPEQ), authorised physicians (AIRM) and radiologists (SIRM); lastly a seminar was given at the *Istituto Superiore di Sanità* (Rome, December 2012). This is also a field where the doses are of concern and where the ALARA principle is to be thoroughly applied.
A poster about EAN and the work of the working group ALARA culture was presented at the Italian Conference of the Radiation Protection Association and the related paper was published in the Proceedings (F. Vermeersch, C. Nuccetelli, S. Risica. *La rete europea ALARA e l'ALARA culture.* In: AIRP Atti del XXV Congresso Nazionale di Radioprotezione, Venezia, 17 - 19 ottobre 2012 ISBN 978-88-88648-35-49).

These days, an expert group of Italian radiation protectionists is devoting great efforts to support the Italian delegate in the discussion of the new EURATOM Basic Safety Standard Directive at the Atomic Question Group of the Council (Brussels). □

[1] *"Problematiche connesse alle esposizioni da radiazioni ionizzanti di operatori e pazienti in Radiologia Interventistica",* that is *"Problems related to patient and worker exposures to ionizing radiation in Interventional Radiology".*

THE NETHERLAND – C. TIMMERMANS (NRG RADIATION & ENVIRONMENT)

Medical x-ray applications outside radiology and hospitals

In the last years, the Dutch Health Care Inspectorate has focused much attention to quality assurance and safety inside radiology departments of hospitals. Other departments where x-ray equipment is used as well as medical practices outside hospitals, where the use of x-ray equipment is increasing, were less in the picture. The Health Care Inspectorate keeps surveillance over the use of medical x-ray equipment, mainly because of the risk associated with the exposure of patients to radiation. For the benefit of this surveillance by the Inspectorate, the National Institute for Health and Environment has carried out a survey of medical practices outside hospitals and the x-ray procedures they perform. In addition, it was investigated where the high dose procedures take place inside hospitals outside of radiology and which are these procedures.

Outside hospitals
Medical x-ray equipment for which a permit is needed, turn out to be applied mainly by municipal health services, next to dentists, mental health institutions and rehabilitation centres. Most noticeable is the increasing use of Cone Beam CT for 3D imaging in dental care. This exposes the patients to higher radiation doses, even though an extra benefit often is not evident. It is reported that in some of these machines the tube voltage is set at a low value to avoid the need for a permit, but which increases the radiation dose to the patient.

Inside hospitals outside of radiology
For this category of procedures, the National Institute for Health and Environment worked out which medical specialists inside hospitals expose patients to relatively high x-ray doses while doing diagnostic procedures and interventions. These are the cardiologists, vascular surgeons, internists, gastroenterologists and urologists. Commonly performed procedures with relatively high doses to the patient are vascular diagnostics, stent placement and diagnostics of the biliary tract. Remarkable is that cardiologists often let their own assistants operate the x-ray equipment while in radiology departments only x-ray technicians who have had an education in radiation protection operate these machines.
http://www.rivm.nl/bibliotheek/rapporten/300080012.html

Diagnostic Reference levels and Achievable Dose levels

In June the Netherlands Commission on Radiation Dosimetry published its final report regarding Diagnostic Reference Levels in Diagnostic X-ray imaging. The introduction of diagnostic reference levels as described in this report is intended to contribute to the optimization of diagnostic X-ray imaging, taking into account that the implementation of the diagnostic reference levels matches as good as possible with clinical practices.

Broadly this report describes: (1) incorporation of diagnostic reference levels within the existing systems of quality assurance, (2) the dose quantities of the reference levels and a brief description of the methods for measuring dose values, (3) achievable dose levels for the exposure of patients that are associated to optimized practices, and (4) numerical values for diagnostic reference levels as an upper limit for 'good medical practice'.

The examinations for which diagnostic reference levels have been established are mammography, radiography, computed tomography and diagnostic fluoroscopy. The established reference values relate to diagnostic imaging of adults and children, and cover practices within the radiology and cardiology departments.

http://www.stralingsdosimetrie.nl/assets/files/ncs_report/NCS%20Rapport%2021%20DRN%20juni%202012.pdf

Draft Radiation Protection Decree

On 19 June 2012 the Draft of the revised Dutch Radiation Protection Decree was published. The main change is that for a large number of applications of radiation with a relatively small risk prior authorisation is changed to a notification by the user of the application. To maintain a high level of Radiation Protection specific directions in the licenses are now incorporated as general rules in the Decree and underlying regulations.

A second important change of the Decree concerns the introduction of the system of registered Radiation Protection Experts and Officers and acknowledged Radiation Protection training institutes.

Scientific meeting of the Dutch Radiation Protection Society

The scientific meetings are held twice a year in April and November. The autumn meeting was held on 16 November and was dedicated to two themes: (1) the production of ^{177}Lu, the clinical application for therapeutic purposes and dosimetric considerations of the application; (2) radiation exposure of the extremities and the eye lens.

The technical and practical aspects of dosimetry of the extremities were discussed. With respect to eye lens dose the formation of cataract, the reduction of the dose limit for the eye lens by ICRP, specific eye lens dosimetry and the protective use of lead glasses were discussed. □

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NORWAY – G. SAXEBOL (NRPA)

With reference to EAN Steering group meeting on the 18-dec. under agenda no. 3 the following points can be mentions from Norway.

- We have made a survey of Radiation Protection education and organized RP-courses with respect to content and volume in the different medical and dental educational institutions given to different types of health professionals in Norway. The results shows considerable variations between different institutions and professions and we plan to be more active in defining the content and quality in the RP-courses given to different health workers who might be exposed to radiation.
- Due to increased focus on security issues in general in the society after the 22 July Tragedy in Norway we have discussed how security can be increased for high activity sources used in hospitals and if some types of installations could be substituted by alternative technology. An example could be blood-irradiators based on X-ray irradiation instead of gamma irradiation from a radioactive source.
- Many different activities have been launched to implement different parts of the national radon strategy involving many different public and private stakeholders.

A pilot study on doses to the eye lens for radiologists and cardiologists have been done. These groups of works might be exposed with higher doses to the eye lens than the proposed new dose limit of 20 mSv/y. The study also showed that the use of personal protection equipment could be optimized further. □

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SWITZERLAND – N. STRITT (SFOPH)

Audit on radio-therapeutical clinic

The Swiss Federal Office of Public Health has audited all radio-therapeutical clinics in the years 2011 and 2012. The results showed that the current state of practice has in general a high level. However in some areas improvements should be approached. In the last September all involved stakeholders had been invited by the Federal Office to participate on a information day, where the results of the audits has been presented and invited representatives of some selected clinics could present their system of good clinical practice. A final report of this audit campaign in German, French, Italian and a summary in English will be available in January 2013.

Second announcement of IRPA Europe

The 4th European IRPA congress will be held in Geneva in Switzerland in 2014 from 23rd to 27th of June. The title of the congress is "Radiation protection culture - a global challenge". The choice of the venue was driven by the intention to involve in the scientific program international organization located in Geneva with a strong link to radio protection such as ILO, WHO, ISO. This congress is organized from the German-Swiss radiation protection association and the "*association romande de radioprotection*" (a French speaking Swiss association). A visit to CERN with its accelerators will be organized during the congress. More information with deadline can be found on the following web site: www.irpa2014europe.com □

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UNITED KINGDOM – P. SHAW (HPA)

1. The following HPA publications may be of interest:

- **HPA-CRCE-042 - Radon in Scottish Homes: Report of a Targeted Programme**
  This report details a 3 year programme to identify homes with significantly elevated radon concentrations and, where high levels are found, to encourage remedial works.
- **HPA-CRCE-041 - Environmental Radioactivity Surveillance Programme: Results for 2011 Including Monitoring Following the Fukushima Dai-ichi Accident in Japan**
- **HPA-CRCE-040 - Scoping Health Risk Assessment for Beach Users at Dalgety Bay to Support Advice to Scottish Government Given in February 2012**
  The aim was to carry out a preliminary assessment of the possible health impact for people currently using the beach area in order to determine if any additional urgent actions were required, in addition to the restrictions on access and advice to beach users that were put in place in the autumn of 2011.
- **HPA-CRCE-037 - Radiological Consequences Resulting from Accidents and Incidents Involving the Transport of Radioactive Materials in the UK – 2011 Review**
  This report includes descriptions of thirty eight accidents and incidents involving the transport of radioactive materials from, to, or within the United Kingdom, which occurred in 2011.
- **HPA-CRCE-035 - Data Report on Radiotherapy Errors and Near Misses, Dec 2009 - Nov 2011)**
- **HPA-CRCE-034 - Doses to Patients from Radiographic and Fluoroscopic X-ray Imaging Procedures in the UK – 2010 Review**

2. Also, two radon-related Newsletters have been published.

Issue 69 (Autumn 2012) (PDF, 602 KB)

- Remediation Case Study Series - 6. Multiple internal sump and fan systems
- Natural gamma radiation linked to childhood leukaemia
- Factors affecting radon reduction
- Awareness of radon in new-build homes

Issue 68 (Summer 2012) (PDF, 819 KB)

- Radon in Scotland: a Targeted Programme in High Radon Risk Areas
- Report on IRPA13,- held May 2012 in Glasgow

- Remediation Case Study Series - 5. Communal Externally Excavated Mini-sump System
- A National Radon Action Plan? - the latest EU draft Basic Safety Standards for ionising radiation
- Radon in the News – media coverage over the past few months

3. HPA received a "negative ion" wristband from a member of the public which was found to contain low levels of Th-232(sec) and U-238(sec). The maximum dose rate to a small area of skin in contact with the wristband was approximately 2 μSv/h. The corresponding equivalent dose was very small – 0.02 μSv per year. However, this is just one sample, and there may be other similar wristbands on sale that contain more quantities of radioactivity as a component of "negative ion powder" (on the internet, there are suggestions that some wristbands may incorporate monazite or rare earths, i.e. which are known to contain natural radioactivity). ■

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