

## Association of **U**niversity **R**adiation **P**rotection **O**fficers

July 2007

**AURPO NEWSLETTER**

Editor T.J.Moseley

<b>CONTENTS</b>	<b>Page No.</b>
1 Editor's Introduction	2
2 Scientific Program for Greenwich Sept 2007	3
3 President's Report & AGM Announcement	4
4 Nominations for Committees and Membership Secretary's Report	5
5 Carriage of Dangerous Goods Regs 2007	6
6 Report from RPA2000	6
7 DEFRA and EA News	7
8 SNIFFER Research Project UKRSR09	11
9 HSE News	13
10 ICNIRP News	14
11 News from HPA-Radiation Protection Division	15
12 AURPO Certificate of Professional Development in Radiation Protection	16
13 Transport of Radioactive Materials by Air	17
14 Protein more important than DNA to survive Radiation Damage	20
15 Emergency Management and HE Project	21
16 UK Strategy for Radioactive Discharges	22
17 RPAs on the Run!	24
18 EMF Directive – SRP Meeting Report	25
19 Affiliates News	28
20 Books and Publications	29
21 AURPO Subscriptions 2007-2008 - <i>DON'T FORGET</i>	30

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## EDITOR'S INTRODUCTION

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This is supposed to be the summer edition but all it seems to do in Sheffield is rain. The floods may have subsided but they have left behind a lot of damage not only to property and businesses but also to roads and rail. Our local emergency may well get people thinking about emergency planning and business recovery so the HEFCE funded emergency management project detailed on p21 has probably come along at an opportune time.

There are still a lot of issues in the EA/DEFRA field at the moment with various project boards and working groups developing: an updated Discharge Strategy; a review of EOs; what's required to be a Qualified Expert and how to manage LLW in future. Thanks to all members who are assisting in these – and giving me reports!

Still to be sorted out is implementation of the new VLLW definitions and what is going to be defined as small volumes of waste. Thanks to all of you that responded to my survey. Most felt they could manage with 1m<sup>3</sup>, others thought a small skip (5m<sup>3</sup>) would be most appropriate. A lot depended on whether one was considering the volume of radioactive waste as VLLW, that one was putting into a skip, or considering the skip itself as a load of VLLW. EA have indicated that they may look on all non-nuclear VLLW wastes as being low-volume disposals so that defining an actual volume limit will not be necessary.

The Carriage Regs (CDG 2007) have been issued on time and are now available online see p6. I had a quick glance yesterday and noted some changes have occurred since the final draft that I saw in March. Unfortunately some of the changes that looked like happening, in response to small users concerns, have been reversed at the last minute because of perceived conflicts with existing derogations – e.g. the exemption from carrying fire extinguishers (Reg31) has now been restricted to 10 excepted packages but as they have left in 'sum of TI<3' it makes the person who wrote it look like they don't know what they are talking about. I'll have to check it carefully and will report on it later.

If you ever wondered what Mark Ramsey (RPA IonActive) gets up to these days he invites you to have a look at his 'blog' - <http://www.ionactive.co.uk/blog.html> - not a bad way of advertising your services actually!

### Reminders:

1. Keep 4<sup>th</sup> -6<sup>th</sup> September free for Greenwich Meeting and book early – by 27<sup>th</sup> July.
2. Don't forget to use Hasnet-Rad as a discussion forum. If you are not signed up to this contact Gus Zabierek ( [g.a.zabierek@bham.ac.uk](mailto:g.a.zabierek@bham.ac.uk) ) who will get you started.
3. Affiliates – See affiliates section at end of newsletter and don't forget to make use of the Newsletter.

**Contributions for next issue by 16<sup>th</sup> November 2007 preferred format Word emailed to -**

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# Scientific Programme – AURPO Greenwich Sept 2007

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## FUTURE OF RADIATION IN UK EDUCATION & RESEARCH

Outline of expected presentations on the scientific meeting day (Sept 5<sup>th</sup>) are as follows.

1. Keynote presentation on Public Perception - Improving Awareness  
( Mike Clark, HPA)
2. Pressure Group Perspective – ( Jean McSorley, Greenpeace)
3. New nuclear build debate – skills required –  
(Jon Bellowes, Univ of Manchester)
4. Radiation in Schools – encouraging future interest  
(Peter Campbell, Nuffield Curriculum Centre)
5. Historical Perspective on Radiation Protection  
(Robin Thomas, UEA Ret)
6. Qualified Expert for RSA93  
(Chris Englefield, EA)
7. Future of the Exemption Orders  
( Allan Ashworth, Atkins/DEFRA)
8. Decommissioning – Future Plans and Expertise Required  
(John Roberts, University of Sheffield)
9. Training requirements for IRMER  
( Steve Ebdon-Jackson, HPA)
10. Effective Regulation – Developing the User-Regulator Interface  
(Gareth Thomas, HSE)

In addition on the Tuesday afternoon (4<sup>th</sup> Sept) there will be two proffered papers from University of Surrey students relating to Chernobyl contamination and the recent Po-210 incident, a report on decommissioning of the Jason Reactor at Greenwich and an update on CDG 2007/Transport Regulations.

## **PRESIDENTS REPORT**

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Time has passed very quickly and the AURPO calendar points at the very important dates of 4<sup>th</sup> to 6<sup>th</sup> September 2007 for our Annual Conference. You will soon be receiving your information pack and registration form. Do send in the registration forms promptly and don't forget to mark the dates in your diary. Tuesday evening will be at a Mystery Venue - no one other than Gillian knows where we will be going! With the Conference dinner in the magnificent Painted Hall and the 'Field Trip' along the River Thames, Gillian has promised a conference for us all to remember! I am looking forward to seeing as many members as possible in Greenwich.

The Scientific Programme this year will have presentations from many interesting and well known speakers on 'The Future of Radiation in the UK Education and Research'. We will hear the perspective view on radiation protection from historic times through to the future of decommissioning and the skills required; how we are going about the business with Effective Regulation and so on..... TCC has once again promised some very interesting sessions.

I can now confirm that the 2009 Annual Conference will be at Cardiff and would welcome the offer of a venue for the year 2010 and beyond.

Once again it is time to think of how you could help the Association. AURPO is a well known professional association and has representatives on many radiation protection related committees and working groups. Please come forward to offer help in running the businesses of our association. You will see the call for nominations inside this issue. I wish to remind you that the association could not go on as it is without the valuable help of its members. Please come forward with your offer and broaden the list of volunteers even more.

With Best Wishes

Sonia

**Sonia Nuttall**  
**25<sup>th</sup> June 2007**

### **46<sup>th</sup> Annual General Meeting of the AURPO**

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In accordance with Section 6(a) of the Constitution, notice is hereby given of the above to be held at 17.00 on Tuesday 4<sup>th</sup> September 2007 at the University of Greenwich. Any motions, duly proposed and seconded must be received by the Honorary Secretary by Monday 6<sup>th</sup> August 2007. All papers will be available at the meeting.

**C Edwards**  
**Honorary Secretary**



# **CARRIAGE OF DANGEROUS GOODS REGULATIONS 2007**

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The Department for Transport has laid **The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007** (CDG 2007) SI 2007 No.1573 in the Houses of Parliament on 7<sup>th</sup> June.

CDG 2007 has now come into force as from **1<sup>st</sup> July 2007**.

An online text of the Regulations is available from  
<http://www.opsi.gov.uk/si/si2007/20071573.htm>

A published hardcopy can be obtained from The Stationary Office at [www.tsoshop.co.uk](http://www.tsoshop.co.uk) or tel 0870 600 5522 quoting ISBN 978-0-11-077469-5.

## **REPORT FROM RPA2000**

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The majority of time has been taken up with the revised HSE Statement on RPAs. Following several meetings at various groups/committees in 2006 about the consultation on it the Board met HSE in September to, as it thought, discuss it prior to signing only to discover it had been signed three days previously and only the Guidance was to be discussed. There followed several more meetings and many emails with HSE on this and RPA2000's scheme which resulted in RPA2000's scheme and all documents being completely rewritten. HSE finally gave approval for RPA2000 to be recognised as an Assessing Body three days before the Statement was to come in force. All new applications would now have to follow the new scheme. If recognition had not been given there would have been no RPA Assessing body in the UK as the BNFL and BINDT ( British Institute for non-destructive testing) ones had both been withdrawn, the latter not having actually ever assessed anyone.

At the Board's AGM in February it was noted there been 72 applications in 2006, of which 32 were for renewal, with a total of 455 current certificate holders at the end of the year. It was noted it is expected there will be a 'bulge' of renewals in 2009 so applicants will be encouraged in 2008 not to leave it until the last moment.

The re-certification system was to remain unchanged but to be reviewed over the year. There had been 14 applications, 5 of which were renewal, for the LPA scheme.

One of the IPEM representatives, who was also the assessment secretary, Graham Hart was standing down and Malcolm Ramsdale was to replace him.

The Assessors met in May 2007 when they discussed the events over the past year, the new documentation, training matrixes, reviewed and commented on experiences with the LPA and RCS schemes and received an update on European Training Initiatives. They also heard about proposals for possible Specialist Certificates in Radioactive Waste and in Instrument Calibration. These will be worked on, discussed and consulted on as they progress.

HSE have indicated that it wishes to review RPA2000's operation in 2008 and it is hoped will attend the next Assessor meeting in May 2008 for discussion.

AURPO Executive is intending to set up a small working party which will discuss items from RPA2000, comment on any proposed changes and propose any it may wish to put forward.

This will be a similar group to those already in existence in SRP and IPEM and strengthen support for RPA2000.

**A R Richards**  
**June 2007**

### News on Regulation of High-activity Sealed Sources (HASS) and Sources of Similar Potential Hazard

The purpose of this note is to highlight:

- a) that by 1 September 2007 all organisations intending to keep or use a HASS after 1 January 2008 will need to have applied for an appropriate registration;
- b) the publication of revised D-values for use in regulation of security of radioactive sources in the UK; and,
- c) new applications forms for HASS and similar potential hazard sealed source and mobile source registrations.

#### **a) Registration of HASS**

The Environment Agency is responsible for implementing (in England and Wales) the High-activity Sealed Radioactive Sources and Orphan Sources Regulations 2005 ([SI 2005 No. 2686](#)) (the HASS Regulations), which amend the Radioactive Substances Act 1993. The guidance on the Environment Agency [web site](#) (or [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) >business and industry >business sectors >radioactive substances users >guidance >HASS guidance) has recently been updated and gives more information.

We are approaching the end of the transitional period for implementing the Regulations; the HASS requirements which have applied to new HASS since January 2006 will apply to all HASS from 1 January 2008. Users of HASS from that date need to hold appropriate registrations. Applications for revised registrations need to be made 4 months in advance. By 1 September 2007, therefore, all organisations intending to keep or use a HASS after 1 January 2008 must have applied for an appropriate registration. The Environment Agency has written to users currently registered to hold sources above the HASS thresholds to remind them of the need to apply. Those not actually holding a HASS but wishing to retain such sources on their registrations will also need to apply. The requirement extends to tenants on nuclear sites but only to mobile sources used by nuclear site licensees.

Because of the expected peak in workload, users are advised to apply early. Appropriate changes to application forms and guidance have been made. The fees for applications are in the charging scheme on the Environment Agency web site.

Once the HASS work is well underway the Environment Agency will write to known users of sources of similar potential hazard to HASS asking them to apply for revised registrations.

#### **b) Revised D-values**

D-values are used by the Environment Agency and their police advisers to determine the source category and appropriate security measures for sealed sources, where this cannot be assessed directly from the use/practice.

Following publication of a revised set of D-values by the International Atomic Energy Agency (IAEA) ([http://www-pub.iaea.org/MTCD/publications/PDF/EPR\\_D\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/EPR_D_web.pdf)), NaCTSO, the Environment Agency, SEPA and EHS NI have agreed that new D-values are appropriate for use in the UK. A new list has been agreed to replace Table 3 of the document "Security Requirements for Radioactive Sources" (NSAC and NaCTSO, October 2005). The list is available on the Environment Agency web site (follow the above links to radioactive substances users). Police CTSA's are distributing the new list with copies of the NSAC

Document. A new version of the NSAC Document is expected soon. The new list also forms part of the guidance on Fixed Condition Registrations (follow the above links to guidance).

The changes are significant for some radionuclides. However the major radionuclides which are in common use, eg Co-60, Cs-137, Am-241, Ir-192 are not changing at all. Overall the effect is to leave most users unchanged, but in cases where less common radionuclides are used the category may go up or down.

### **c) New Application Forms**

Following requests from users, a new set of application forms have been produced. Members of the Agency's Small Users Liaison Group (SULG) have reviewed draft application forms for us and we have incorporated their views. Thanks very much to those who assisted. They have been reviewed for plain English and professionally designed. They are now available in Adobe pdf versions capable of being completed and saved electronically (follow the above links to radioactive substances users).

The new forms cover HASS and sealed sources of similar potential hazard and mobile source registrations. The application form for Fixed Condition Registrations has also been adjusted. Further forms covering storage in transit, open source registrations and disposal authorisations are at an advanced stage.

Site specific queries should be raised with your normal Environment Agency Area office but general enquiries can be made to: [Peter.brember@environment-agency.gov.uk](mailto:Peter.brember@environment-agency.gov.uk)

## **Small Users Liaison Group (SULG 28) June 07 EA – Process & Policy Update**

### **Exemption Order Review**

Following the first phase of this programme – initial stakeholder consultations culminating in a stakeholder workshop (Cardiff January 2007) - the programme is now into phase 2, which is concerned with determining the best 'architecture' or overall structure for a future exemptions regime. Note that we are not in any way constrained to use the existing structure (that is, a series of stand-alone regulations) for the future.

In order to do this determination, the programme board has agreed a three-step process:

1. Convening of an expert group (some 15 – 20 experts) to determine the most appropriate options' assessment methodology and also what additional information might be required to conduct such an assessment. This group meeting is planned for 11 July 2007.
2. Convening of a wider group of experts (say, 35 – 40) to conduct a formal and recorded options' assessment. This will probably take place in the autumn of 2007.
3. Presentation of recommendations from 2. above to formal public consultation. This is scheduled for autumn-winter 2007.

To support this process, a number of tasks are under way to produce the following:

- Options matrix and description.
- Options assessment methodology.
- Paper describing how the options were derived, tracing back to the Cardiff workshop.
- Information sheets describing the current and possible future uses of exemption orders.

In parallel with these tasks, but not directly related to the options' assessment process at this stage, tasks are under way to produce the following information:

- Can we anticipate any new devices, procedures or uses of radioactive materials which might have to come within a future exemptions regime?
- What will be the effect of changing numerical values in the current EO suite on the volumes of exempt material and LLW?
- What does 'substantially insoluble' mean?
- What other legislation, policy initiatives and EU programmes (e.g BSS negotiations) will have an impact on the programme (the 'horizon scanning' task).

Richard Harrison is representing 'small users' on the program board for the EO Review and Trevor Moseley will be our representative on the 'options assessment meeting on 11<sup>th</sup> July.

### **Qualified Experts**

Workshops were held in March and were characterised by very constructive stakeholder engagement that extended the project board's thinking considerably. Several AURPO members were at the Scottish and Southern meetings (including Brian Heaton, Peter Marsden and Penny Giorgio from TCC).

The project board recently held a review of the proceedings that provides additional direction to the project work, and a SNIFFER report is now expected to be published by SNIFFER in the middle of September [www.sniffer.org.uk](http://www.sniffer.org.uk).

Now anticipated that the project will recommend a "core competencies plus suitability" approach rather than the "core competencies plus sector-specific competencies" approach originally envisaged. The emphasis remains on developing a scheme that the regulators and the regulated will find practicable, and that aids transparency of the regulators expectations to improve compliance and protection of the environment.

The completed SNIFFER project report will be reviewed by the environment agencies and decisions about further work will be made.

We do not anticipate any substantial additional burdens on regulated parties; the contractors' report concerns itself mainly with formalising current regulatory arrangements, while perhaps going a little further towards assisting the radiation protection profession to bring on the next generation. We have also given considerable thought to the transition arrangements, including the question of 'grandfather rights'. Further news will be provided at the AURPO Conference in September.

### **Low level radioactive waste policy**

Government published its new LLW policy on 26 March 2007. It is available at: [www.defra.gov.uk/environment/radioactivity/waste/index.htm](http://www.defra.gov.uk/environment/radioactivity/waste/index.htm)

The changes introduced by the new policy include:

- greater flexibility in the management of the wide range of LLW that already exists, and will arise in future from nuclear decommissioning and other nuclear and non-nuclear industry arisings;
- emphasis on the application of the waste hierarchy to minimise the amount of LLW for disposal;

- initiating the first steps towards development of a UK-wide strategy for the management of non-nuclear LLW. The first step in this will be for Defra to undertake a study, which will give a clear picture of arisings and disposals across the UK.
- making the NDA responsible for development of a UK-wide strategy for the management of nuclear industry LLW, including the identification of the need for additional LLW disposal capacity and facilities;

EA will be working closely with SEPA to look at the implications for regulatory policies, processes and guidance.

### **Transfrontier shipment of radioactive waste**

Defra is working on a first draft of the new TFS Regulations, which will implement Directive 2006/117/Euratom. The principal change is that import/export of spent nuclear fuel will need prior authorisation by EA. EA are seeking a charging scheme through transposition of the TFS Directive.

Implications of new LLW Policy. The Government's new LLW Policy Statement permits, for the first time, the routine export/import of LLW for treatment and processing, provided it can be demonstrated that this is the BPEO.

### **Guidance on Disposal Facilities for Solid Radioactive Waste**

The original GRA (Guidance on Requirements for Authorisation) was primarily focused on deep geological disposal facilities. The intention now is to produce two separate guidance documents, one aimed at near surface facilities and the other at deep geological facilities. EA are aiming to have drafts of the documents suitable for public consultation available by the end of 2007.

They are currently preparing skeleton drafts of the two new guidance documents and are conducting a survey of relevant literature. A workshop was held on Thursday 21 June 2007 in Manchester to consider how the new documents should be structured and the key references to be employed in preparing them. The safety principles of the GRAs and stakeholder engagement were the main items discussed. Most NGO concerns related to long-term management of disposal sites and guarantees of future safety. It was not clear whether the GRA for near-surface repositories would extend to cover conditions for special precautions burial although it was stated that not all near surface facilities would need to be highly engineered like Drigg – it depends on the waste being deposited. It was intended though that near-surface facilities would be dedicated for radioactive wastes and not be for hazardous wastes in general. On-site burial of wastes may be an option

### **RSR Strategic Information Management System**

- or to put it simply online transfer of information, application forms and payment of fees through a secure IT system.

SULG members and some colleagues assisted EA in a survey of how users would like to use such a system and any technical difficulties that they may have in using it. Chris Englefield is trying to make a business case to introduce such a system and thanked members for their help.

### **Environment Agency “Fixed condition registration – category 5 sources”.**

Registration of premises for holding sealed sources will for most people fall into one of three categories, plus there is still the category for mobile sources. For those with a HASS source you will need to pay £2042 for an application and an annual subsistence of £1341. If you have

a combined activity which is greater than a category 5 source it will cost you £1475 with a £1204 annual subsistence. The final new category is for limited quantities of sealed sources. The main limitation is that the total holdings of sealed sources need to give an A/D of less than 0.01, the same as a NSAC security category 5 source. There are also a few additional restrictions for certain types of sources.

Guidance, application forms and a draft registration can be found at:-

<http://www.environment-agency.gov.uk/business/444304/945840/>

The application form appears to be straight forward, and there is even an electronic version with embedded guidance notes. There are two new conditions in the registration “General Management” and “Accident Management Plan” but guidance is given and these conditions only require what most already have in place. The big advantage is that this is a generic registration so all you need to do is keep the total sealed sources below the A/D of 0.01, no more variations are required just because you change the quantity or types of sealed sources. The application or variation charge is £635 and a subsistence charge of £267, though a variation of an existing registration to a fixed condition registration is free and if an authorisation is also held then there is no subsistence charge.

*The above information on SULG issues was gleaned from pre-meeting reports and other communications. Unfortunately I missed the meeting as I was marooned in Sheffield by the floods! -Ed*

## **SNIFFER Research Project UKRSR09**

### **–Dose implications of very low level radioactive waste disposal**

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The Scotland and Northern Ireland Forum for Environmental Research (SNIFFER), on behalf of Scottish Environment Protection Agency (SEPA) and the Environment and Heritage Service (EHS), has commissioned this research to review the practice of disposal of small amounts of radioactive waste with ordinary domestic or trade waste. This practice is referred to as dustbin disposal or the disposal of very low level waste (VLLW).

Current VLLW disposal is in line with Government policy which promotes, when safe to do so, the disposal of low level radioactive waste by conventional methods such as incineration or disposal to landfill. The route is used extensively by the non-nuclear sector such as hospitals and universities and by a few small nuclear users.

There have been substantial changes to conventional waste management practices in the past few years with the advent of legislation such as the Landfill Directive (Council Directive 1999/31/EC 1999), such that much greater emphasis is placed on diverting wastes from landfill. Consequently, conventional wastes are now increasingly subject to recovery, reuse or recycling. In particular, there has been a significant increase in the segregation of waste types at source, resulting in separate disposal routes for different waste types.

Disposal of VLLW with ordinary conventional waste provides a valuable and cost effective option for many users of radioactive substances. It is a route which is routinely authorised by the UK environment agencies for the premises of the non nuclear sector without any need for specific radiological assessment. This project seeks to establish whether or not current practices of VLLW disposal remain an acceptable environmental option.

The specific aims of the project are to:

- Consider relevant developments in conventional waste policy and practice in the UK from 1995 up to 2010;
- Review and describe traditional methods of VLLW disposal and identify future developments in radioactive substances policy which may affect disposal routes;
- Assess the level of generation of VLLW across the UK by way of assessment of a subset of users of this disposal method;
- Identify likely routes for ordinary waste and types of waste collected for disposal and any intermediate steps to which the waste may be subjected e.g. recovery or composting;
- Provide generic dose assessments for VLLW authorisation for identified disposal scenarios;
- Identify instances whereby VLLW as per the current standard conditions may result in doses in excess of the dose criterion of 20 micro sieverts/ year;
- Provide guidance on revision of the standard condition of authorisation to allow the continued use of the VLLW disposal route.

*A report on this project should be available shortly. If you can't wait you can look up a presentation given at the Keele SRP meeting by Roger Wilmot of Galson Sciences –*

<http://www.srp-uk.org/slides/070425keele/1135wilmot.pdf>

*You should find that the likely doses from VLLW disposals by whatever route are insignificant and that all the VLLW could be deposited in one site without exceeding the 20uSv/y dose constraint.*

# HSE NEWS

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## ***Radiation Protection News - Issue 30 April 2007***

### **Contents**

1. [Publication of the new Statement on Radiation Protection Advisers \(RPAs\)](#)
2. [Applications for Certificate of Core Competence](#)
3. [RPA Assessing Bodies](#)
4. [Nuclear Industry Changeroom Code of Practice](#)
5. [Nuclear medicine patients and radiation detectors at UK ports and airports](#)
6. [Incident involving Alexander Litvinenko](#)
7. [New edition of Safety Assessment Principles](#)
8. [Additional Guidance on IRR99](#)
9. [Clarification in relation to comforters and carers when entering controlled areas](#)
10. [Additional Guidance on "Radiation Employer"](#)
11. [Missing values in Column 5, Schedule 8](#)
12. [Persons below the age of 16 working with ionising radiation](#)
13. [Further guidance on the definition of sealed sources in relation to the Ionising Radiations Regulations 1999 \(IRR99\)](#)
14. [Special procedures and radioactive contamination](#)
15. [Role of an RPA and Advice from RPOs etc.](#)
16. [Application of IRR99 - What is work with ionising radiation?](#)
17. [Further guidance on the requirements for contingency plans under the Ionising Radiations Regulations 1999 \(IRR99\)](#)
18. [Leak tests for smoke detectors](#)
19. [Advice from the Environment Agency on IAEA Category 5 Source Permit Simplification and Standardization](#)

A bit delayed, but a packed HSE newsletter. RPA issues take prominence with the implementation of the new HSE Statement but the bulk of the newsletter is devoted to additional guidance on IRR99. 14 items that could benefit from improved guidance were identified by a working group chaired by James Taylor. 4 issues were not amenable to improved guidance because it was thought that amendment to IRR99 was required. These items, referred to HSE Policy Group, relate to: Radon Action Levels; Outside Workers; Employer and Radiation Employer terminology; and contradictions in the regs relating to dose-rate management. The 10 other issues which could be dealt with are detailed in items 9-18 of the newsletter which you can hopefully link into above, if not the web address is as follows - <http://www.hse.gov.uk/radiation/ionising/rpa/rpa30.htm>

## ICNIRP NEWS

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### **ICNIRP/BfS International Workshop on EMF Dosimetry and Biophysical Aspects Relevant To Setting Exposure Guidelines**

May 2007 - The ICNIRP "International Workshop on EMF Dosimetry and Biophysical Aspects Relevant to Setting Exposure Guidelines" covered the whole frequency range, from static fields to terahertz. Internationally recognised experts presented lectures on those topics and discussed the relevance of recent research findings with regard to exposure limits for workers and the general public.

----> [more information](#)

----> [restricted access to participants and speakers](#) with access data (to be obtained through the [ICNIRP Secretariat](#))

----> workshop proceedings [here](#)

### **Protecting Workers from Ultraviolet Radiation**

March 2007 - The objective of this document jointly published by ICNIRP, ILO and WHO is to provide information and advice on protecting workers from ultraviolet radiation (UVR) exposure. The adverse health effects of both acute and chronic UVR exposures are reviewed, emphasizing solar UVR exposure of the outdoor worker. Epidemiological observations and health consequences concerning exposure to UVR (180-400 nm) are also addressed. The document is now available in electronic format and will be soon available as a hard copy.

----> ICNIRP/WHO/ILO document is available [here](#).

### **ICNIRP/EMF-NET/WHO Workshop on current trends in health and safety risk assessment of work-related exposure to EMFs, 14-16 February 2007, Milan, Italy**

February 2007 - The latest three-days Workshop on current trends in health risk assessment of work-related exposure to EMF organized in Milan, Italy, 14-16 February 2007 by ICNIRP in cooperation with EMF-NET and WHO was a great success ! Key-note speakers addressed the issue of occupational exposure to electromagnetic fields, with ample time devoted to open discussions. In addition to technical aspects, the content and implementation of the EU Directive of 2004 on EMFs was presented. Stakeholders' point of view and different approaches on the evaluation and management of this issue in Europe and outside, as well as the WHO/NIOSH recent publication on EMFs at workplaces were discussed. All presentations are available online.

----> Presentations and abstracts are available [here](#).

## NEWS FROM HPA- Radiation Protection Division

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The Radiation Protection Division have been busy publishing reports with nine new ones loaded up on their website since the last newsletter. Of particular interest to members might be HPA-RPD-021 which reports on the 16 transport incidents that happened in the UK in 2005. Of these 11 were small user/non-nuclear incidents involving damage to packaging, loss of packages and theft from vehicles. Fortunately none appear to have resulted in significant doses to the public. HPA-RPD-20 is a report on the large quantities of VLLW that will need to be disposed of from nuclear sites and is not to be confused with the work that SNIFFER have been doing on the disposal of VLLW from small user sites.

- **HPA-RPD-028**  
[Results of the 2004 NRPB Intercomparison of Passive Radon Detectors](#)
- **HPA-RPD-027**  
[Results of the 2003 NRPB Intercomparison of Passive Radon Detectors](#)
- **HPA-RPD-026**  
[Occupational Exposure to Electromagnetic Fields at Radio Transmitter Sites](#)
- **HPA-RPD-025**  
[Influence of Nephrotoxicity on Urinary Excretion of Uranium](#)
- **HPA-RPD-024**  
[Uncertainty Analysis of the ICRP Systemic Model for Uranium as applied to Interpretation of Bioassay Data for Depleted Uranium](#)
- **HPA-RPD-023**  
[Uncertainty Analysis of the ICRP Human Respiratory Tract Model applied to Interpretation of Bioassay Data for Depleted Uranium](#)
- **HPA-RPD-022**  
[Doses to Patients arising from Dental X-ray Examinations in the UK, 2002-2004  
A Review of Dental X-ray Protection Service Data](#)
- **HPA-RPD-021**  
[Radiological Consequences Resulting from Accidents and Incidents Involving the Transport of Radioactive Materials in the UK - 2005 Review](#)
- **HPA-RPD-020**  
[Radiological Assessment of Disposal of Large Quantities of Very Low Level Waste in Landfill Sites](#)

### Laser Safety Matters

This regular newsletter of the Laser Safety Forum is published on the HPA website and the latest edition can be found at:-

[http://www.hpa.org.uk/radiation/publications/newsletters/laser\\_safety\\_matters/index.htm](http://www.hpa.org.uk/radiation/publications/newsletters/laser_safety_matters/index.htm)

This document is an essential read for all those interested in lasers and other non-ionising radiations. It not only gives an update of recent developments in standards but also gives useful information on other optical sources and publications from ICNIRP and CIE as well as meeting reports and details of future training in laser safety.

### MRI Safety

The Radiation Protection Division (RPD) of the Health Protection Agency (HPA) is undertaking a review and revision of advice on protection of patients and volunteers

undergoing MRI examinations. Previous advice was published by the predecessor of RPD, the National Radiological Protection Board (NRPB, 1991a, 1991b).

More recently the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has reviewed the science relevant to possible adverse health effects from such exposures and published its advice (ICNIRP, 2004).

The HPA advice will similarly take account of a review of the science and, recognising the importance of global harmonisation, will focus on the ICNIRP recommendations and particularly as to the application of this advice in the UK.

The review will be carried out by a Working Group comprising HPA staff and two external experts (Professor Penny Gowland, University of Nottingham and Professor Jeff Hand, Hammersmith Hospital).

The HPA would very much welcome input now from all interested parties including corporate and professional bodies and MRI equipment developers and users, by way of providing any information that they feel is relevant to the development of the HPA advice. Of particular interest would be information related to potential problems in the development and use of MRI equipment were the ICNIRP 2004 guidelines on patient and volunteer exposure to be implemented in the UK.

All information should be sent to [mriwg@hpa.org.uk](mailto:mriwg@hpa.org.uk).

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## **AURPO Certificate of Professional Development in Radiation Protection**

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This course has been developed by the Scottish Centre for Occupational Safety and Health (SCOSH, University of Strathclyde) and the Association of University Radiation Protection Officers (AURPO) in collaboration with the Health and Safety Executive (HSE) and RPA 2000.

The aim of the course is to assist those people wishing to attain greater knowledge and understanding of radiation protection matters. The course is benchmarked against the HSE criteria for the 'Core of Knowledge' required for a Radiation Protection Adviser.

- ◆ 9 month programme commencing September 2007
- ◆ study by distance learning with online tutor support
- ◆ available to graduates currently working in radiation protection or related fields.

For further information and an application form:

Tel: 0141 548 4147

Email: [scosh@strath.ac.uk](mailto:scosh@strath.ac.uk)

Web: [www.cll.strath.ac.uk](http://www.cll.strath.ac.uk)

# TRANSPORT OF RADIOACTIVE MATERIALS BY AIR

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## Current Regulations

The current regulations recognised and followed by the world's airlines are the 48<sup>th</sup> Edition of the IATA Dangerous Goods Regulations (1.1.2007 –31.12.2007). In relation to the transport of radioactive materials these regulations are based upon the IAEA Regulations for the Safe Transport of Radioactive Materials (ST-1 revised).

## Exemptions

First of all it is important to remember that only those radioactive materials that have both an activity concentration and a total activity above the exemption limits specified in BSS and repeated in Table 10.4.A of the IATA Regulations are deemed to be radioactive under the IATA Regulations. There are therefore a lot of useful exemptions that can be used for some of the commonly used radionuclides (see Table 1 below). However, if your (non-) radioactive material also happens to be in the form of diagnostic specimens or biological products some airlines have restrictions on these too.

**TABLE 1 - Activity Limits For Exempt Radioactive Materials**

<b>Nuclide</b>	<b>Activity concentration for exempt material (Bq/g)</b>	<b>Activity limit for an exempt consignment (Bq)</b>
H-3	$1 \times 10^6$	1 GBq
C-14	$1 \times 10^4$	10 MBq
P-32	$1 \times 10^3$	100 kBq
P-33	$1 \times 10^5$	100 MBq
S-35	$1 \times 10^5$	100 MBq
Ca-45	$1 \times 10^4$	10 MBq
Cr-51	$1 \times 10^3$	10 MBq
Fe-55	$1 \times 10^4$	1 MBq
Fe-59	$1 \times 10^1$	1 MBq
Co-57	$1 \times 10^2$	1 MBq
Co-60	$1 \times 10^1$	100 kBq
Ni-63	$1 \times 10^5$	100 MBq
Rb-86	$1 \times 10^2$	100 kBq
Tc-99m	$1 \times 10^2$	10 MBq
In-111	$1 \times 10^2$	1 MBq
I-123	$1 \times 10^2$	10 MBq
I-125	$1 \times 10^3$	1 MBq
I-131	$1 \times 10^2$	1 MBq

If you are shipping any of the above exempted quantities you just need to apply common sense robust packaging that will withstand the normal rigours of transport without reference to any documentation.

## Radioactive materials in general

If you have got more than an exempt quantity that you wish to send to a colleague overseas it is worth noting that the material you are transporting is now classified as dangerous goods and there is a general prohibition on such goods being carried by passengers or crew as either carry-on or checked in luggage. A shipping agent will therefore have to be used. Also note

that there are some airlines that will not take radioactive materials at all, including the world's favourite airline! These are as follows:-

British Airways, British Mediterranean Airways, Air Austral, Air Europa, Corsair, Southern Air (outside US), Copa Airlines, Air Pacific, Transavia Airlines, KLM.

Some will only take radioactive materials under special arrangements – Nippon Airlines and others will only take excepted packages – Virgin Airlines.

### Radioactive Materials in Airmail

Subject to the provisions of national postal authorities, airport authorities and airlines themselves the IATA Regulations permit 1/10<sup>th</sup> of the excepted package limits in airmail and the documentation requirements of the regulations (10.8) are not applied.

Some countries impose additional restrictions. These are as follows:-

- Canada - not allowed in airmail
- UK - special arrangements needed for patient specimens
- Fiji - special permission required, not permitted in diagnostic specimens or in biological products
- France - competent authority approval required
- Netherlands - not allowed in airmail
- Sri Lanka - not permitted in diagnostic samples or biological products
- South Africa - not allowed in airmail

Then there are airlines which will not accept radioactives in airmail. These are as follows:-

Avianca, Finnair, EVA Airways, Cargolux, Etihad Airways, Malaysia Airlines, Czech Airlines, Turkish Airlines, Vietnam Airlines, Corse Mediterranee.

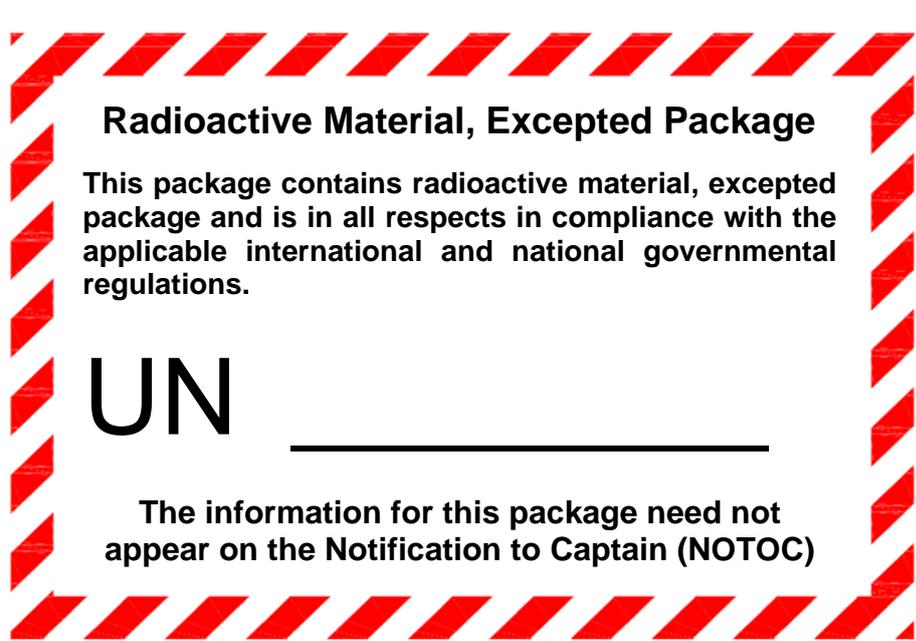
Providing the airline you use and the country you want to send something to/or through do not impose prohibitive restrictions the quantities that may be sent in this way are as indicated in Table 2 below subject also to the general requirements for excepted packages being met. Note that this will mean display of the new more prominent label for excepted packages – see Fig 1.

**TABLE 2 Activity Limits For AirMail Packages**

<b>Nuclide</b>	<b>Ordinary Solid Form</b>	<b>Liquid Form</b>
H-3	4 GBq	400 MBq
C-14	300 MBq	30 MBq
P-32	50 MBq	5 MBq
P-33	100 MBq	10 MBq
S-35	300 MBq	30 MBq
Ca-45	100 MBq	10 MBq
Cr-51	3 GBq	300 MBq
Fe-55	4 GBq	400 MBq
Fe-59	90 MBq	9 MBq
Co-57	1 GBq	100 MBq
Co-60	40 MBq	4 MBq
Ni-63	3 GBq	300 MBq
Rb-86	50 MBq	5 MBq
Tc-99m	400 MBq	40 MBq

In-111	300 MBq	30 MBq
I-123	300 MBq	30 MBq
I-125	300 MBq	30 MBq
I-131	70 MBq	7 MBq

**Fig.1 Transport Label for Excepted Packages**



Unfortunately the position in the UK is that Royal Mail do not take radioactive materials. Therefore **only exempt quantities can be transported by a route that will involve Royal Mail in the UK.**

### **Summary**

Because these days there is no scope for taking anything by hand except for exempt quantities, anyone wishing to ship excepted or Type A packages will have to do this through a shipper or shipping agent familiar with dangerous goods cargo. They will advise on packaging and deal with all the paperwork for you. If you are wanting to use a standard radiochemical overseas it would be advisable to get the manufacturer to ship it to a convenient location direct rather than having to arrange shipment yourself.

**T.J.Moseley**  
**RPA University of Sheffield**  
**18/05/2007**

**PS** Don't forget that there may still be the Transfrontier Shipment Regulations to comply with that will require prior approval from competent authorities for sealed source transfers and notification in arrears (every calendar quarter) for unsealed source shipments. Exemption levels are low e.g. H-3 5MBq, C-14 0.5MBq, I-125 50kBq. See Euratom No.1493/93

## **Protein more important than DNA to survive radiation damage**

### **Manganese ions protect proteins from damage in a strain of radiation-resistant bacteria**

The well-worn assertion that radiation is so damaging to cells because of its effects on DNA is beginning to look a little dubious, particularly in light of research reported in *PLoS Biology* today. Michael Daly and colleagues find that the bacterium *Deinococcus radiodurans* can survive massive doses of radiation because of a powerful protective mechanism that shields its proteins, not its DNA, from damage.

Ionising radiation does damage DNA, especially causing double-strand breaks that are difficult to repair properly. However DNA damage is clearly not the whole story as *D. radiodurans* can survive doses of radiation sufficient to cause 100 double-strand breaks per genome, whereas the radiation-sensitive bacterium *Shewanella oneidensis* dies after a dose of radiation that causes less than one double-strand break per genome.

So why is *D. radiodurans* so tough? One clue comes from the fact that it and other radiation-resistant bacteria contain high concentrations of manganese ions. Daly and colleagues discovered a link between the concentration of manganese ions in the cells and the amount of certain oxidative damage the cells' proteins undergo as a result of irradiation. They blocked the accumulation of manganese or inhibited the cycling of these ions in *D. radiodurans*. When they then irradiated the cells, they found that the bacterial proteins were no longer protected from oxidative damage and the cells became susceptible to the radiation.

Given the same radiation dose, radiation-resistant and -sensitive bacteria undergo about the same amount of DNA damage. However, Daly and colleagues show that the proteins in the radiation-sensitive bacteria are much more damaged than those in the resistant ones. "We propose that sensitive bacteria sustain lethal levels of protein damage at radiation doses that elicit relatively little DNA damage, and that extreme resistance in bacteria is dependent on protein protection," they conclude.

They outline a model of radiation damage where protein is the prime biological target of radiation in sensitive bacteria and that radiation resistance in the manganese-accumulating bacteria is associated with some form of protection of the cellular proteins from oxidative damage. "...these findings may come to affect models of radiation toxicity, as well as approaches to control recovery from radiation injury, including the development of systems for delivery into cells of manganese-based radioprotective complexes," they conclude.

### **References**

1. Daly MJ, Gaidamakova EK, Matrosova VY, Vasilenko A, Zhai M, *et al.* Protein oxidation implicated as the primary determinant of bacterial radioresistance. *PLoS Biol* 2007, **5**:e92.

doi:[10.1371/journal.pbio.0050092](https://doi.org/10.1371/journal.pbio.0050092)

*The above is an example of a news article published by the newly formed 'Forum for Global Health Protection'. They are a not-for-profit Community Interest Company, established with support from the HPA. Their remit is to make a significant global contribution to the preparedness for the fight against new, emerging, re-emerging and changing health threats including those from radiation exposure. They are establishing an open-access online journal called 'Emerging Health Threats'. For further information look up their website at -*

<http://www.fghp.org/index.html>

# EMERGENCY MANAGEMENT & HE PROJECT

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## About the Project

This project is being funded by the Higher Education Funding Council for England (HEFCE) and is being project managed through Bernadette Duncan (Head of Security & Telecoms Services and Safety Liaison Officer) at City University on behalf of AUCSO (Association of University Chief Security Officers). The project is running from June 2007-April 2008. There are two main aims of the project:- a) to produce a guide to good practice in managing major incidents and emergencies on campuses, and b) to help build the capacity of Higher Education Institutions (HEIs) to manage emergencies and major incidents by piloting training for HEIs.

## How We May Help You

We hope the project will be of interest and benefit to members of the Society for Radiological Protection. Key outcomes will be:

- Collation of examples of case studies & existing good practice in emergency management within HEI's or similar organisations, including planning, training and guidance literature.
- Production & dissemination of an HE sector specific best practice guide for emergency planning and management, with reference to disaster recovery and business continuity.
- A customised emergency management training programme for HEI managers, initially within London but with an aim to later roll out the training nationally.

## Can You Help Us?

We are looking for current examples of emergency plans, policies and post-incident reports within Higher Education, either your own or others you have encountered through your research etc. If you or colleagues in your institution may be able to help by sharing examples of your plans and/or case studies of incidents & lessons learned please contact us. Please also let us know if you would like to be kept updated about this project – our details are below.

## About the Consultants

Dr Anne Eyre is an independent consultant specialising in Disaster Management with particular interest in emergency planning, preparedness and response. She helped develop the first degree programmes in Disaster Management in the UK at Coventry University and continues to provide educational, training and consultancy services to various Universities, practitioner colleges and organisations specialising in emergency planning and response. Her operational experience includes responding to the needs of those directly affected by the September 11 attacks 2001, the Potters Bar rail crash, 2002 and the Asian Tsunami 2004. Contact [anne.eyre@traumatraining.com](mailto:anne.eyre@traumatraining.com). Tel: 02476-505262 Mob: 0777-3894675.

Lucy Payne is an independent consultant specialising in Disaster Management with particular interest in risk management and Business Continuity Planning. She co-runs an MSc programme in Emergency Management and Planning at the Civil Emergency Management Centre, University of Hertfordshire and provides guest lecturing, training and examination services for various other UK University and practitioner courses specialising in emergency management. Her operational experiences includes assisting in identification and repatriation procedures following mass fatality events such as on September 11 2001, the Bali bomb attacks in October 2002 and the Kenya air crash, 2003. Contact: [L.C.Payne@herts.ac.uk](mailto:L.C.Payne@herts.ac.uk). Tel: 07968021050

# UK STRATEGY FOR RADIOACTIVE DISCHARGES

## - Stakeholder Workshop 19<sup>th</sup> April 2007

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The workshop was held at DEFRA's Innovation Centre in Reading. Delegates represented nuclear and non-nuclear industries, regulators, and representatives from Ireland, Norway, the Isle of Man and Iceland. NGOs were also invited but none were able to send representatives.

For the first hour there were three presentations by DEFRA. The rest of the day was taken up by work in one of four breakout groups, with a plenary session to close.

**Brian Oliver** outlined why we need to have a discharge strategy. He stated that it is government policy to progressively reduce discharges and this led the UK to sign up to the OSPAR agreement for the protection of the NE Atlantic marine environment in 1998. He pointed out that the OSPAR objectives, reducing concentrations of NORM to near background and of artificial radioactive substances to close to zero, did not specify a timescale for achievement. However the Commission does state that "discharges, emissions and losses of radioactive substances are reduced to levels where the additional concentrations in the marine environment above historic levels, resulting from such discharges, emissions and losses, are close to zero" by the year 2020. There has been no definition of historic levels or of close to zero and it doesn't sound like there will be one in the near future. However, baseline values for concentrations, discharges and doses have been defined, being derived from average values over the years 1995-2001.

The 2006 Evaluation report (see OSPAR website) indicates how well we are doing in relation to baseline values and looks at trends for total alpha, total beta and tritium. For the nuclear industry, some results are above baseline, whilst others are showing statistically significant reductions, and for some the reductions are substantial. For non-nuclear sectors there is no evidence of whether the strategy is being delivered, but some signs exist that appropriate actions are being taken. Note that no targets have been applied to the non-nuclear sector.

**Martin Hum** looked back to the 2002 Strategy, which set out to achieve progressive and substantial reductions in discharges, progressive reduction in critical group doses (the 20 $\mu$ Sv by 2020 is an expectation, not a target or a limit), and progressive reduction in concentrations. He then showed what targets had been set for fuel production/uranium enrichment, energy production, reprocessing, research (including reactors and Dounreay) and defence, and how each sector was progressing toward achieving them. He also displayed total beta discharges per year for each sector up to 2005. The 2002 Strategy did not set targets for the non-nuclear sector, but expected tight control from the regulators and discharge reduction where practical. The lessons to be taken forward are

- reduction is not a straightforward exercise (though closure of facilities has helped);
- close liaison with stakeholders is essential;
- assumptions and discharge projections are uncertain;
- not all discharges are equal (in terms of impact on environment); and
- there is a need to look at the bigger picture (but when questioned, seemed to reveal that DEFRA's bigger picture isn't that large – it doesn't look at impact of non-radioactive agents on the environment, and is not justifying new build)

**Yvette Bosworth** covered the strategy review, which has come about for several reasons: a change in the nuclear landscape; a need to prepare for the next OSPAR report, to broaden the scope of the current strategy, and to update assumptions and projections. With regards broadening the scope, the current strategy deals with liquid discharges from nuclear

installations only, and DEFRA want to include aerial discharges and non-nuclear industry sectors. Including aerial discharges will provide the “bigger picture” and will indicate whether the good work reducing liquid discharges has been at the expense of increased gaseous releases. The non-nuclear sectors to be included are grouped into oil & gas, medical, radioisotope production, pharmaceuticals, universities & research institutes, and waste treatment/disposal facilities. The new 2006-2030 Strategy will be out to consultation towards the end of this year prior to publication in summer 2008. Initial meetings and surveys in preparation for the revision have been going well with the nuclear industry, but the non-nuclear sector is finding it difficult to predict future discharges. Also the sector usage is very diverse. The key challenges are:

- reliability of discharge projections;
- addressing non-nuclear sector (not sure if they can set targets);
- assessing cost/benefit and proportionality (and how to include social and economic factors);
- achieving a balanced strategy; and
- the potential impact of a new build policy.

DEFRA plan to set up an industry liaison group, with which it can continue dialogue (probably by email) as the strategy development progresses.

DEFRA stressed that they had no inside knowledge regarding a potential nuclear new build, but are making the prudent assumption that their discharge strategy should assume a new build programme will happen.

The four break-out sessions were presented with a series of questions to which delegates were asked to give their own answers. Individual responses were then collated and condensed to produce one or two key messages per question. These were then used to fill in the blanks on generic statements “The strategy must/should/could..... because..... Furthermore..... However.....”. These statements should be made available to delegates shortly.

The final session allowed time for each breakout session to deliver key messages to the whole workshop. These were:

#### **Session 1: Regulatory Impact Assessment and Proportionality**

- The strategy needs to be flexible for long-term needs;
- Discharge levels should also be flexible;
- Move away from reliance on closure of facilities;
- Make discharge targets proportional to the scale of the site;
- Don’t rely on absolutes – use productivity/efficiency indicators; and
- There needs to be scientific justification of targets.

#### **Session 2: Potential nuclear new build**

- Recognise the new build programme exists and needs flexibility;
- There is no major step-change in technology for discharge reduction;
- Need to explain risks to the public;
- Recognise the political landscape has changed since 2002 – this is not a declining industry any more;
- Have a discharge trading market (cf carbon trading scheme); and
- Don’t forget medical expansions.

#### **Session 3: Key environmental principles underpinning the strategy**

- Suggestions/proposals need to be practical and achievable;

- Strategy needs to fit with other government strategies;
- Enforcement vs guidance vs incentives;
- Consistency across countries; and
- Consistency with other environmental risks/hazards.

#### **Session 4: Non-nuclear discharges**

- Diversity makes it hard to group the non-nuclear industries;
- Potential conflict with other government strategies (eg cancer treatment);
- No further reductions over 2002;
- Need to consider public perception/awareness;
- Use exemption orders wherever possible; and
- Take a risk-informed approach.

DEFRA are encouraging continued dialogue and hope to have a draft strategy for formal consultation before the end of 2007.

**Peter Marsden**

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### **RPAs on the Run!**

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The run in question is the Great South Run on 28th October in Portsmouth over 10 miles. Those doing it are all London NHS based RPAs:

Jim Thurston (King's College Hospital)  
 Mandy Moreton (Guys and St Thomas')  
 Ishmail Badr (St Georges Hospital)  
 Steve Evans (Royal Marsden)  
 Peter Marsden (University College Hospital)

They are raising money for the Chernobyl Children's Project (UK). Info from their website: "The charity now includes around 30 groups in England, Scotland and Wales. Each summer it provides recuperative holidays in the UK for about 400 children from Belarus. The project also organises holidays in clean parts of Belarus for children who cannot come to the UK. CCP (UK) delivers medical supplies and other humanitarian aid to Belarus. It supports a children's hospice, trains orphanage staff to prepare children for fostering, and works with partners in Belarus to establish better care for children and young people with disabilities."

More info at [www.cherobyl-children.org.uk](http://www.cherobyl-children.org.uk)

To sponsor a London RPA go to:

[www.justgiving.com/LondonRPA](http://www.justgiving.com/LondonRPA) or email [peter.marsden@uclh.nhs.uk](mailto:peter.marsden@uclh.nhs.uk)

## EMF Directive – SRP Meeting Report

An SRP meeting on the 30<sup>th</sup> January saw representatives of the HSE (Arwel Barrett) and HPA (Simon Mann) introducing and summarising the EU Directive on EMFs. This was followed by a talk from Hugo Bibby of Link Microtek who discussed EMF measurement (For details of measurement equipment and services offered use the following link: [www.radhazonline.com](http://www.radhazonline.com))

The EU Directive on restricting occupational exposures to EMFs (EC/40/2004) was adopted in April 2004 and is due to be implemented in UK law in April 2008 and the consultative documents were due at the end of Spring 2007. All restriction values used by the Directive are taken from the ICNIRP guidelines 1998 and 1994 with the main purpose of the Directive to avoid known adverse health effects but not long term affects such as possible carcinogenic effects that are not backed up by conclusive scientific evidence. The Directive does not provide justification for relaxing standards if existing standards are more stringent than required by the Directive and it emphasises the needs/ benefits of reducing exposure at source e.g. engineering controls.

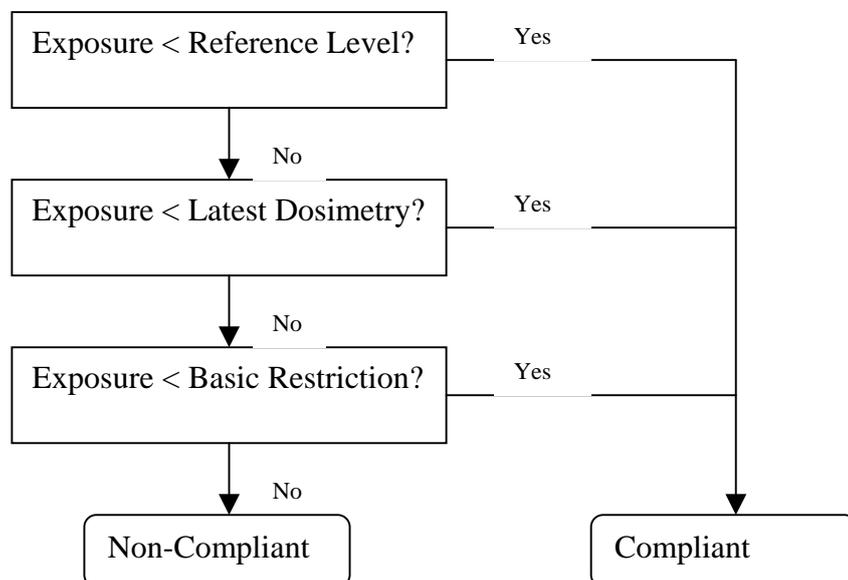
The requirements of the Directive are specified by ‘Articles’ that are summarised as follows:

Articles 1 and 2 define the aim and scope of the directive before providing some definitions of terms.

Article 3 states that exposure restrictions are defined by Exposure Limit Values (ELVs) and Action Values (Avs) and are to be found in the Annex, tables 1 and 2 (This compares with Basic Restrictions and Reference Levels in the ICNIRP guidelines). It is also stated that standards are to be developed by EU Standards bodies with a generic standard on determining workers’ exposure currently in draft (prEN50499) and due anytime.

Article 4 specifies the need to determine exposure and carry out risk assessments. Tables 1 and 2 (see below) are draft CENELEC tables (taken from Health and Safety Monitor vol:29, no.12 December 2006) showing what equipment is likely to require further exposure assessments and what equipment would be assumed to comply with CENELEC standards. For example, products that are CE marked comply with public levels and wouldn’t need assessment.

If equipment does require further assessment then the 3 stage assessment process provided by HPA is recommended. The assessment process or compliance test can be summarised by the following:



A detailed description of the 3 stage process can be found on the following link:

[http://www.hpa.org.uk/radiation/understand/information\\_sheets/icnirp\\_exp\\_guidelines.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/icnirp_exp_guidelines.htm)

Article 5 describes provisions that must be taken to avoid or reduce risk and, in particular, the need to prepare an action plan if ELVs may be exceeded. It includes the need for signage and specifies that workers shall not be exposed above the Exposure Limit Value.

Article 6 details the need for worker information and training. This must include explaining the concept of ELVs and Avs, measures to control risk, adverse health effects and safe working practices.

Article 8 deals with the need for Health Surveillance and how it should be carried out. It specifies that a medical examination should be made available if exposure above limit values is detected.

Although it was concluded that if compliance with NRPB Guidelines (revised 2004) is already established then the impact of the directive will be small it was accepted that MRI is an ongoing source of contention with particular concern that the Directive could effectively prohibit some MRI procedures (intervention techniques). This is because switched gradient fields, which have a frequency range of 100 to 1000Hz, can exhibit levels that exceed ELVs as can the induced body currents from movement through the static magnetic field.

**Draft CENELEC tables giving examples of equipment that will likely be subject to compliance testing and highlighting the types of equipment that should be compliant.**

Table 1: Examples of equipment likely to require further risk assessment	
Equipment type	Comments
Industrial electrolysis	Both AC and DC types
Electrical welding and melting	
Induction heating	
Dielectric heating	Including bulk tape erasers Not valid for small handheld equipment
Dielectric welding	
Industrial magnetizer/demagnetizers	
Microwave and RF lighting	Includes vacuum deposition and sputtering
RF plasma devices	
Diathermy	All medical treatment equipment using high power (> 100mW) RF sources
Electric crack detector system	Typically more than 100mW RMS (< 20W peak)
High power radar	
Electrically driven transport: trains and trams	
MRI-equipment	
Industrial microwave heating and drying	Further assessment is necessary if workers can get closer to the antenna than the defined safety distance.
Base station antennas	
Other electricity supply networks in the workplace and electricity distribution and transmission circuits passing over the workplace that do not satisfy the criteria in Table 1 (above).	Assessment criteria are given in an Annex to the Directive .

Table 2 : Examples of equipment likely to comply with the CENELEC standard (regardless of the amount of electrical equipment present at the workplace).	
Examples of electrical equipment	Comments
CE-marked equipment that has been assessed using one or more of the standards listed in an Annex (e.g. to UK legislation or CENELEC guidance).	
Equipment placed on the EU market in compliance with EU Recommendation 1999/519/EC and in compliance with related harmonized standards shown in the EU's Official Journal.	
Lighting equipment	Excluding microwave and RF lighting (see Table 2)
Computer and ITE equipment	
Office equipment	Tape erasers may need further assessment
Mobile phones, and cordless phones	
Two-way radios	Only types with emitted power less than 20mW.
Base stations for DECT cordless phones	
N-n wireless communication equipment and networks	
Electric handheld and transportable tools	e.g. covered by EN 60745-1 and EN 61029-1
portable heating tools	e.g. covered by EN 60335-2-45 (glue guns, heat guns)
Battery chargers	e.g. covered by EN 60335-2-29
Electric operated garden appliances	
Audio and video equipment	Special types using radio transmitters typically used by the broadcast industry may need further assessment
Battery powered equipment not including radio frequency transmitters	
Electrical room heating equipment	
All non-electrical equipment	
Electricity supply networks in the workplace	The criteria for demonstrating compliance with workplace exposure limits are based on demonstrating that the exposures do not exceed the lower EU recommended limits for the general public. They are sufficient for demonstrating compliance in the majority of workplaces.
Electricity distribution and transmission circuits passing through or over the workplace: For magnetic field exposures the following are likely to be compliant: electrical installation with a phase current rating of 100 A or less; individual circuit within an installation with a phase current rating of 100 A or less; circuit where the conductors are close together and having a net current of 100 A or less; components of the networks satisfying the criteria above are covered, (including the wiring, switchgear, transformers); overhead bare conductors of any voltage.	Assessment criteria, based directly on the workplace exposure limits of the Directive, are given in an Annex to the Directive. They use 500A in place of 100A and 200kV instead of 100kV. A checklist may be used for demonstrating compliance for magnetic fields, and a further Annex may be used for demonstrating compliance for electric fields in the workplace.
For electric field exposures the following are likely to be compliant: underground or insulated cable circuit rated at any voltage; overhead bare circuit rated at a voltage up to 100 kV, overhanging the workplace.	
Instrumentation, measurement and control equipment	
Household appliances	Professional appliances such as cookers, laundry machines, microwave ovens in restaurants, shops are included in this list. Professional inductive heating equipment may be excluded
Computer and ITE equipment including wireless communication	
Battery driven transmitters	Transmitters with output power above 100mW may need further assessment If a person carries multiple active transmitters and the sum of the output power is above 100mW this may need further assessment
Base stations antennas	Further assessment required if workers could get closer to the antenna than the defined safety distance in relation to public exposure limit values.
Medical equipment not using RF sources	

## Resources:

[www.hse.gov.uk/radiation/nonionising/electro.htm](http://www.hse.gov.uk/radiation/nonionising/electro.htm)

[www.hpa.org.uk/radiation](http://www.hpa.org.uk/radiation)

[www.hpa.org.uk/radiation/understand/information\\_sheets/icnirp\\_exp\\_guidelines.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/icnirp_exp_guidelines.htm)

[www.who.int/peh-emf](http://www.who.int/peh-emf)

[www.icnirp.org](http://www.icnirp.org)

[www.rivm.nl/bibliotheek/rapporten/610015001N.html](http://www.rivm.nl/bibliotheek/rapporten/610015001N.html)

[www.healthandsafetymonitor.com](http://www.healthandsafetymonitor.com)

[www.radhazonline.com](http://www.radhazonline.com)

<http://www.hse.gov.uk/research/rrpdf/rr338.pdf>

<http://www.hse.gov.uk/aboutus/hsc/meetings/2007/150507/c31.pdf>

In addition the HSE has just published an important research report on 'Assessment of Electromagnetic fields around MRI Equipment'. It can be found at:

<http://www.hse.gov.uk/RESEARCH/rrpdf/rr570.pdf>

**Report on EMF from Dr PA Harris, Univ of Sheffield**

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## AFFILIATES NEWS

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### News from LabLogic

Until the end of July, LabLogic is offering readers of the AURPO Newsletter a free Geiger Muller contamination monitor complete with a source calibration certificate when they order a Triathler portable LSC/Luminometer/Gamma Counter.

An indispensable instrument for many RPAs/RPO's/RPSs and other experts, Triathler is a single well counter ideal for users who have just two dozen or so samples to analyse. It accommodates all vial sizes, from Eppendorf tubes up to 20 ml capacity. In addition, LabLogic also offers a robust, reliable and fully supported range of contamination monitors. To take advantage of this offer, please contact Elvir Zahirovic on 01142 667 267 or [ezahirovic@lablogic.com](mailto:ezahirovic@lablogic.com)

### News from BIC - LARNET replacement?

After being contacted by Mike Ainscough (retired) from RADMIL (Radiation Monitoring In Lancashire) last year, we were asked to put together a replacement system for measuring Gamma Dose & Meteorological parameters around the Lancashire County.

We have developed the RadMet system. It comprises a compensated Geiger and a modular range of meteorological instruments (wind vein, anemometer and tipping bucket rain gauge). The device, whilst designed for use by emergency planners is also a useful research tool for investigating the variation in environmental dose rates, which are significantly increased during intense rainfall events.

Jim Fitzgerald wrote the basic software system to communicate with the remote devices, display the information on the web & send text alerts if a Geiger went into alarm. Another Liverpool Company wrote some graphical software (GIS) to sit on top of this to give easy visual indications. Different levels of password access for different emergency response teams, make the system 'saleable' to different government departments.

Some electronics had to be developed to convert the Geiger & Raingauge signals to RS232.

Mike Scott believes he has a strong team for this project with Harry Hunter acting Chairman (former NE Technology sales director). Chris Murdock (Peak RPA) has experience of the early RADMIL system and is providing radiation protection and environmental advice.

Once the main software is installed on a server, the stations are relatively cheap. Further details can be seen at [www.bictechnology.co.uk](http://www.bictechnology.co.uk) & click on RadMet.pdf at the bottom of the page.

### News from Global Dosimetry

Last but not least please find at the end of the newsletter an ad from Ron Dearden detailing the service and product line up that Global Dosimetry can provide.

## BOOKS AND PUBLICATIONS

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Beta Radiation Shielding with Lead and Plastic: Effect on Bremsstrahlung Radiation when Switching the Shielding Order

Wesley R. Van Pelt and Michael Drzyzga  
Health Physics, Vol. 92, No. 2, Supplement

Health Protection Matters – Issue 6

<http://www.hpa.org.uk/publications/PublicationDisplay.asp?PublicationID=47>

Features – The polonium-210 contamination incident  
Medical ultrasound – is it safe?

Radiation Protection News – Issue 30 April 2007

<http://www.hse.gov.uk/radiation/ionising/rpa/rpa30.htm>

HPA-RPD-020

Radiological Assessment of Disposal of Large Quantities of Very Low Level Waste in Landfill Sites

[http://www.hpa.org.uk/radiation/publications/hpa\\_rpd\\_reports/2007/hpa\\_rpd\\_020.htm](http://www.hpa.org.uk/radiation/publications/hpa_rpd_reports/2007/hpa_rpd_020.htm)

HPA-RPD-021

Radiological Consequences Resulting from Accidents and Incidents Involving the Transport of Radioactive Materials in the UK - 2005 Review

[http://www.hpa.org.uk/radiation/publications/hpa\\_rpd\\_reports/2007/hpa\\_rpd\\_021.htm](http://www.hpa.org.uk/radiation/publications/hpa_rpd_reports/2007/hpa_rpd_021.htm)

HSE Books

Assessment of Electromagnetic fields around MRI Equipment, P Chadwick

<http://www.hse.gov.uk/RESEARCH/rrpdf/rr570.pdf>



Association of  
UNIVERSITY  
RADIATION  
PROTECTION  
OFFICERS

### AURPO Subscription 2007-2008

## To all members

The annual subscription of **£20** (£10 for retired members) to the Association was due on the **1<sup>st</sup> July 2007**. Members who attend the Annual Conference in September 2007 may pay the subscription fee at the time of registration. Please remember to pay on time and make life easier for your treasurer. If you are not attending conference please pay now and return the tear-off slip below, together with your cheque made payable to AURPO.

**Gillian Glazier**

**Honorary Treasurer**

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To: Mrs G C Glazier, Honorary Treasurer, AURPO

21 Viewland Road  
Plumstead  
London SE18 1PE

I enclose a cheque **payable to AURPO** for the sum of **£20 (£10 retired member)** in payment of my subscription to the Association of University Radiation Protection Officers for the **year 2007-2008 (1<sup>st</sup> July 2007 to 30<sup>th</sup> June 2008)**.

**I confirm my membership of IRPA through the Association.**

**Name:** .....

**Address:** .....

.....

.....

.....

**Telephone:** .....

**Fax:** .....

**Email:** .....

**Signed:** ..... **Date:** .....

# GLOBAL DOSIMETRY SOLUTIONS

## The Confident Choice In Radiation Monitoring Services



Rely on the experience and expertise of Global Dosimetry Solutions (GDS) to provide the right dosimeter monitoring products, reliable data collection and permanent compliance documentation.

GDS has been creating custom solutions to meet the needs of its customers for the past 30 years. At our core, we believe in building relationships to meet your account needs today and in the future. With advanced online account management capabilities, superior customer and technical support, you will have piece of mind that your radiation program is built upon the best practices.

GDS is fully accredited through the Health and Safety Executive (HSE), NVLAP in the United States and Canada's CNSC.

Global Dosimetry Solutions... your trusted partner in radiation monitoring services.

## Superior Service

### Customer Support

GDS customers are assigned dedicated customer support representatives. By assigning an individual to an account, our customers are confident in the knowledge the person they are dealing with is aware of their special requirements. Our support staff receives ongoing education to keep them up-to-date on monitoring services.

### Online Account Maintenance

As a customer of GDS you will have access to GDS-Online, our ever-expanding online account management solution. Every aspect of your account can be handled efficiently and accurately.

With GDS-Online you can:

- Manage individual wearers and badge assignments
- Reassign badges
- Transfer individuals between locations
- Generate various reports and review dose histories
- Edit and update account information
- View audit trails

### My Dose Record (MDR)

MDR is a secure, easy and convenient way for your employees to access their dose history online. With MDR, employees can view their dose history at any time, in real-time and print their dose history records. Whether one badge or several are worn, the history for each badge is listed separately. An email notification is sent when a new dose history is available.

### Expert Radiation Safety and Technical Assistance

Our Technical Group is staffed with highly qualified health physics and radiation dosimetry experts, and are available to our customers to provide assistance. With over 100 years of combined experience of our technical staff is on the cutting edge of radiation monitoring technology.

### Accurate Reporting and Solid Data Integrity

All processing and service is performed at GDS headquarters. Each report provides the information needed to meet government regulations, and confirms that proper steps are being taken to ensure that you are in compliance with regulatory requirements.

Exposure data is stored in archival data retention vaults and is accessible anytime.

# Array of Dosimetry Products

## Film

Film Dosimeters provide accurate personnel detection of radiation exposure from the use of diagnostic X-ray equipment. Badges are slim and lightweight and can be worn on the body or used for monitoring an area.

The film packet is sealed to shield the sensitive material from light-induced exposure. Radiation penetrates five different filter areas before reaching the film to simulate different tissue depths. Processed film is archived by GDS and is accessible anytime for reevaluation or to document the radiological safety of your office. Dosimeters using Kodak film offer a superior archival quality and have a developed exposure image.



## TLD

Global Dosimetry Solution's TLD dosimeters are based on state-of-the-art technology. These small, lightweight dosimeters offer long wear periods due to their resistance to environmental factors.

All processing is fully automated. Proprietary algorithms provide for exceptionally accurate dosimetry. Reports are computer generated with exposure histories automatically updated. Dosimeters come pre-loaded, eliminating the need for badge loading.

TLD's respond accurately to beta, gamma, X-ray and neutron radiations and allow for the reporting of deep, lens of eye and shallow doses.



## MeasuRing

Global Dosimetry Solution's Ring Dosimeters provide technicians with a convenient, attractive way to monitor radiation exposure to the hands and fingers. Rings are optimized for monitoring beta, X-ray or gamma radiation.

GDS rings can be worn under surgical gloves or in wet environments. With immersible single-piece construction, wear periods can range from 1 week to 1 quarter. Various sizes and colors are available to choose from.



## Measurements of Extreme Doses

The GDS High Dose Dosimeter reliably measures exposure for non-personnel working environments such as radiation therapy, research applications, equipment calibrations, or sterilization applications.

The High Dose is the perfect measurement device in environments where radiation dose levels exist between 2 and 50,000 rads. A reliable LiF TLD chip offers excellent response, and is energy and dose independent for most levels up to 1,000 rads. Above that level, GDS employs optical density filters, which reduce the excessive amount of light TLDs emit, so the PM tube does not become saturated and assessment accuracy is assured.



## CR39 Neutron

In facilities where employees work with neutron generators or Linear Accelerator Cyclotrons, the CR39 provides accurate exposure determinations. The CR39 may be used separately for neutron detection, or in conjunction with other dosimeters such as the GDS Film and TLD whole body dosimeters.

Exposure to neutrons cannot be detected by film and requires a specific calibration for TLD dosimeters. The GDS CR39 neutron dosimeter is energy independent and a practical and convenient way to accurately monitor exposure to intermediate and fast neutron radiation.



**Global Dosimetry**  
Solutions

a division of Mirion Technologies

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