



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

December 2015

**AURPO NEWSLETTER**

Editor **T.J.Moseley**

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## EDITOR'S INTRODUCTION

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Welcome to the December Newsletter and a Happy Christmas and New Year to all our members.

Many thanks to conference reporters and to Mike Lockyer with his excellent SULG report –lots of important news there. Let Mike Sobanski at Cardiff ([sobanski@cf.ac.uk](mailto:sobanski@cf.ac.uk)) know of any topics you feel we have overlooked at Conference and would like covering in the future.

Don't forget your emergency training and contact me to make use of our STS training monitors and simulated spillage material – hire for just £100 for up to 2 weeks.

**PS** Don't forget to renew your subscription –see reminder from Treasurer from page 28. You also need to contact Gillian to subscribe to Health Physics at the special members rate – see page 29.

I'm retiring from my duties at Sheffield and there is a new post available - see below.

Expect Spring edition of newsletter around Easter – contributions by 25<sup>th</sup> March please.

**T.J.Moseley**

**Retiring RPA University of Sheffield**

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## Job Vacancy at University of Sheffield

### Radiation Protection Officer in Department of Health & Safety

Grade 7 (£29,847 to £37,768 with potential to progress to £41,225 through sustained exceptional contribution)

Reporting to Tom Fleming (Head of Health & Safety) ( [t.fleming@sheffield.ac.uk](mailto:t.fleming@sheffield.ac.uk) )

**Closing date 6<sup>th</sup> January**

To assist the Head of Health & Safety under the direction of the Radiation Protection Adviser in ensuring that the University, together with its staff and students, comply with the requirements of the Ionising Radiations Regulations 1999, the Environmental Permitting Regulations 2010 and other acts, regulations and guidance pertaining to work with ionising and non-ionising radiations.

The Radiation Protection Officer is responsible to the Head of Health & Safety. Outlined below are some of the aspects of work included in the role: - management of waste disposal; approving orders for departmental radioisotopes requirements; carrying out testing and calibration of radiation monitors; management of the issue and return of monitoring badges and rings for radiation workers; maintenance of central records.

The successful candidate will hold a degree in a physical science based subject; and will undertake additional training as necessary to ensure continual professional development. Additionally, effective communication skills both written and verbal are essential, as is experience of delivering presentations. You will have the ability to prioritise your own workload and meet defined deadlines, whilst working as part of a larger multi-disciplinary health and safety team. An up to date knowledge of IT packages and software is required. A basic knowledge of electronics would be desirable.

Contact Tom Fleming for further information or apply online at - <https://www.sheffield.ac.uk/jobs>

## MEMBERSHIP NEWS

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Membership Secretary is Sonia Nuttall ( [somchairuk1@hotmail.co.uk](mailto:somchairuk1@hotmail.co.uk) )

Welcome to the following new members of the Association who have joined since July:-

Louise Brown	SEPA
Andy Charlton	MRC
Rebecca Duguid	Foresterhill Hosp, Glasgow
Rory Jamieson	Aberdeen RPS
Kishore Malabhanti	Hretfordshire Univ.
Richard Marsh	Southampton Univ.
Eoin O'Scannail	Sussex Univ.
Richard Smith	Aberdeen RPS
Samuel Oliver Wane	Harper Adams Univ.
Mike Wetherell	Exeter Univ.
Richard Michael Wright	Strathclyde Univ.

### Life Memberships

Gillian Glazier and Phil Tattersall were both awarded Honorary Life Membership of AURPO at the Annual Dinner in Eastbourne in September.

Gillian received her certificate from John Makepeace, after he gave a brief description of Gillian's very significant contribution to the work of the Association both as Treasurer and as Local Organiser for two Annual Conferences.

Phil was presented with his certificate by Brian Heaton (retiring Chairman of the Scientific and Technical Committee) who described Phil's long career at PHE (formerly NRPB and HPA) and the contribution that he has made to AURPO over the many years that he has been a member of STC.



### New STC Chairman

**NB** - Gus Zabierek has succeeded Brian Heaton as the chairman of the Scientific and Technical Committee.

# PRESIDENT'S REPORT

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I must start my report with my thanks to everybody who was responsible for making the 2015 Annual Conference in Eastbourne such a success.

- Special thanks go to Gillian Glazier for having acted as Local Organiser on behalf of the London and South East Regional Group, assisted by James Wallbank, Mike Lockyer and Jon Fear. They were backed up with help from the Executive Committee Members carrying out a multitude of tasks behind the scenes.
- The Scientific & Technical Committee under Brian Heaton put in an enormous effort, as always, to secure the services of speakers who were both informative and entertaining.
- The scientific sessions ran smoothly under the direction of David Plumb and Richard Harrison.
- We should all be grateful to our exhibitors and sponsors, whose contributions greatly assist in keeping the conference at a very reasonable cost, and give our members the chance to meet with the suppliers of so many of the services that we all need. This year, the exhibition came with its own very special challenges, when two weeks before the event we were told that the planned venue for the exhibition would not be available due to building work. Thanks go to Simon Willis, the View Hotel staff and the exhibitors who between them made the necessary alternative arrangements work.

Julie Turner is now working hard to complete the arrangements for the 2016 Conference in Loughborough, which will be held on Tuesday 6<sup>th</sup> and Wednesday 7<sup>th</sup> September at the Holywell Conference Centre with accommodation at the Burleigh Court Hotel, a few minutes' walk away. Julie is being helped in her task by the East Midlands Regional AURPO Group. As ever, the STC are already well into the task of planning the Scientific Programme under their new Chairman Gus Zabierek.

I am sorry to report that Simon Willis has tendered his resignation from the Executive Committee, due to pressure of work. Simon has been responsible for liaising with our Affiliate Members and our exhibitors in particular. He was also Local Organiser for our very memorable conference in Newcastle, which celebrated the 50<sup>th</sup> anniversary of the Association. My thanks go to Simon for all his efforts on behalf of AURPO over recent years. Jim Hunter, from the University of East Anglia, has agreed to take over the administration of the Loughborough Exhibition, and our affiliate members can look forward to hearing from him in the New Year.

Christine Edwards will be representing AURPO at the 14th Congress of the International Radiation Protection Association, ([IRPA14](#)) to be held in Cape Town in May 2016. Christine is AURPO's member on the SRP International Committee and currently chairs that committee.

For 2017, Hull has been awarded the title of UK City of Culture. The Executive Committee was very pleased to receive an offer from the University of Hull to hold our conference there during this

special year for the city. The provisional dates are the 5th & 6th September 2017, and it is hoped that this will soon be confirmed. Our thanks go to Tim Coldwell for making this offer and volunteering to act as Local Organiser for this event, with assistance from members of the North AURPO Regional Group.

Well, I think that that has covered most of what I had to say, although I always seem to remember something I have forgotten when I read the printed version.

May I wish you all a very Happy Christmas Holiday, and a New Year that is healthy, prosperous, safe and free from enforcement actions!

**Merry Christmas**  
**John Makepeace, 18<sup>th</sup> Dec 2015**

## **A word from the Treasurer**

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### **Conference**

This year I wore two hats. One as the Organiser for the L&SE AURPO group and one as the Treasurer.

Although not strictly a topic for this report, I would however like to comment that despite the many problems that we encountered, the conference was a success, bringing forth several favourable comments from both delegates and exhibitors. This was truly a team effort and my thanks go to James Wallbank and Mike Lockyer, John Makepeace, Simon Willis, Christine Edwards, David Plumb & Richard Harrison, Jon Fear, Gwen Mott and Mr D Spackman.

Financially the conference showed a very healthy surplus of more than £14000. This was unusually high as we were reimbursed by the hotel, where we held the conference, and the bus company, who took us to and from the dinner, for the difficulties and inconvenience that we suffered from each of them.

### **Health Physics**

The cost of this is £65 for the 2016 subscription. If you would like to receive this journal, please fill in the form at the end of the newsletter and return it to me by 31<sup>st</sup> January.

### **Outstanding Subscriptions**

There are still some of you who have not responded to my e-mails on the topic. **Please do so ASAP**

There is a subscription renewal form at the end of the newsletter along with details about how payment may be made. It costs £35 for members and £10 for retired members. If you need an invoice, please mark it on the form + the PO number, if it is necessary.

*Merry Christmas and a Happy New Year*

*Gillian*

# Eastbourne Conference September 2015 - Meeting Report

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## Tuesday PM update session

The meeting was well attended with over 70 delegates participating in the meeting and around 20 exhibitors demonstrating the latest technologies and services available in the radiological protection industry.

The Tuesday sessions opened with an Introduction and Welcome from the Lord-Lieutenant of East Sussex who gave the delegates a great insight into the role of the Lord-Lieutenant (and no, it doesn't come with a seat at the House of Lords!), how he represents the Sovereign in the county and the relevance of the Lieutenancy within the local community. One of the key duties is to look after members of the Royal Family and Heads of State when they pay official visits to the County of East Sussex but a not so well known fact is that the Lieutenancy maintains close relationships with the Armed Forces, reflecting the ancient office's original responsibility for the maintenance of order and local defence of the County.

The first speaker of the afternoon was **Max Pottinger from High Technology Sources Ltd** giving a presentation on 'Special Form' sources. A Special Form source is a type of sealed radioactive source, defined in the IAEA transport regulations, in which the design is such that the radioactivity does not disperse in a transport accident situation. The benefit of this is that the activity limits for Special Form sources in specific types of transport package are normally higher than those for non-Special Form sources. A source can only be certified as Special Form by the national competent authority, which in the UK is the Office for Nuclear Regulation (ONR). Delegates were reminded to check the validity of their Special Form certificates as it may have lapsed and require a renewal assessment. HASS sources were also briefly mentioned and the enhanced security measures that apply.

Max also touched on the Recommended Working Life (RWL), not just of Special Form sources but any sealed source, and made mention of the Environment Agency's advice on ANY sources beyond twice their RWL to be considered as 'disused' (Page 21 of the Environment Agency's "How to Comply with your EPR RSR environmental permit – sealed sources" document v1.1 – April 2011). *(Ed – NB the context of the EA Guidance was in defining a disused source, and a source more than 2 x RWL could not be kept as a spare source. If it was not in use (stored in a cupboard), then it should be treated as disused and disposed of accordingly. If it is still in use, in good condition and checked regularly, then the RPA can permit its continued use.)*

**Dr Bernard Graneek from the Royal Marsden Hospital** delivered the next presentation on Appointed Doctors. Dr Graneek began with a brief history of appointed doctors in the workplace right from the first mention of an Act to improve the ill effects of Mill workers in 1802 up to the modern day Acts, Statutory Instruments and Regulations we have today. It is important to remember that Appointed Doctors are mentioned in several regulations and must be General Medical Council registered as well as having a licence to practice. Appointed doctors look at many things including the assessment of persons' fitness to work, identify health issues, determine the need for specific workplace conditions, identify work-related health problems, etc. Dr Graneek was also keen to point out that it is quite often those workers who are not classified working with ionising radiation that get the most worried.

**James Taylor from the HSE** began the next presentation by giving an overview of the current Radiation Team at the HSE and how current budgets and resources are shaping the way they regulate with proactive inspections focussing on high risk areas and poor performers. A hot-topic for a number of years has been

the increase in the use of X-ray Fluorescence (XRF) analysers and the ease with which these can find their way into industries not normally associated with working with ionising radiations. A number of issues that these analysers highlight is:

- Very high dose rates near the aperture (Sv/h)
- Highly portable; used on own premises and in those of other employers
- Companies offering to hire out analysers
- The analysis of small (hand-held) parts can be an issue
- Interlocks can be over-ridden in the software

James was keen to point out that although there are the issues above, suitable notification to the HSE under Reg 6 of the Ionising Radiations Regulations (IRR99), and an adequate prior risk assessment under Reg 7, should ensure work with XRF analysers is carried out safely. A key downfall of XRF analyser users is their failure to carry out an adequate prior risk assessment by not following the checklist in paragraphs 44 & 45 of the IRR99 Approved Code of Practice. As always, a suitable Radiation Protection Adviser should be consulted to ensure good compliance with IRR99.

Following a refreshing coffee break and tour of the exhibition, **Mr Fahd Quhill, Consultant Ophthalmologist from the Royal Hallamshire Hospital, Sheffield**, gave an interesting presentation on macular burns in children from the use of 'toy' or novelty laser products. It was shocking to see the damage caused by these novelty products and superb quality of the pictures showed just how the eye was affected. Mr Quhill's passion for reducing these needless injuries to children shone through and he conveyed to the delegates the need to put pressure on manufacturers of these devices to limit their power.

Rounding off the afternoon session was **Robert (Rab) Hill from Aurora HP**. Rab began by introducing BS4094 Part 1 – Shielding from Gamma radiation and took delegates through a series of worked shielding examples for simple geometries looking at things such as: point source exposure calculations, gamma ray constants, transmission factors, build-up factors, half- and tenth- value layers (HVL/TVL), broad/narrow beam conditions, and linear/mass attenuation coefficients. Rab finished off the presentation by discussing the Monte Carlo method for more complex shielding calculations and the pro's and con's of both the Monte Carlo method and the more simple BS4094 method.

**Reporter: Mark Green**

*Assistant Radiation Protection Adviser, The University of Edinburgh.*

## **AM Wednesday 9<sup>th</sup> Scientific Session**

### **Recent ICRP developments – John Harrison**

The International Commission on Radiation Protection makes recommendations based on scientific research reports from UNSCEAR. These recommendations then in turn are used to develop regulations such as the EU Basic Safety Standards. ICRP has a main commission supported by the scientific secretariat, and 5 underpinning committees that look at specific radiation protection areas, labelled C1-C5. ICRP has undergone some new developments, for added transparency the main commission is now elected for 4 year terms and a strategic plan developed in a 4 year cycle. Also there is a biennial symposium to discuss recent developments in radiation protection.

There was a quick review of the health effects of exposure to ionising radiation and the evidence for stochastic effects below the observed evidence at 100mGy in the linear no threshold model. A description of equivalent and effective dose followed including some recommendations from ICRP103 for the use of reference phantoms for the calculation of equivalent dose, changes to the tissue weighting factors and the concept of stochastic detriment.

The presentation then moved onto the involvement of the C2 committee and its task groups in effective doses, internal dose coefficients particularly the Occupational Intakes of Radionuclides parts 1-5, development of new phantoms and biokinetic models, and radon exposure dose calculations. The new phantoms and models that have been developed are much more accurate and include children, specific tissue modelling, different bones structures, and updated respiratory tract models.

The rest of the presentation was taken up with the ICRP publication 115 and statement on Radon. The statement on radon proposed a new risk co-efficient of  $5 \times 10^{-4}$  per working level month (WLM) which has implications for the upper reference level value for homes by reducing it from 600 to 300 Bq m<sup>-3</sup>. There is also a move towards dosimetric approaches by modelling from epidemiological approach. The models that have been developed are very detailed and complicated but have led to the adoption by ICRP of a figure of 12mSv per WLM.

Information on effective dose and publications produced by the other committees was also included in the handouts but was not covered during the presentation.

### **Biological effects of radiation with reference to the eye – Dr Colin Martin**

Dr Martin, who is a member of ICRP committee 3, gave a very interesting presentation on the development of radiation induced cataracts and the consequent recommendations for the reduction in the eye dose limit. There have been considerable disagreements with radiologists and cardiologists about the ICRP recommendation to reduce the eye dose limit from 150mSv to 20mSv averaged over 5 years with no single year exceeding 50mSv due to the development of radiogenic cataracts.

Cataracts are an opacity in the lens, they can be caused by a number of factors: genetic, age, trauma, drugs and radiation including ultraviolet, infrared, microwaves and ionising radiation. Cataracts are treatable with a 97% success rate. There was a description of the anatomical structure of the eye with particular emphasis on the lens. The lens fibre cells require epithelial cells to provide nutrients etc. these peripheral epithelial cells in turn become the lens fibre cells and are therefore important in the development of cataracts. There are different types of cataracts but one type, posterior subcapsular cataract (PSC) is rare and almost entirely due to ionising radiation.

The mechanism of radiation damage is not by cell killing but via disruption of the cell queuing and migration to the posterior lens. Early studies of cataracts in radiologists had a short follow-up but the disease has a long latency, more recently these studies have been of larger numbers, longer periods and at lower doses. These studies have shown evidence for a dose threshold and in a study of interventional clinicians 38% had PSC as opposed to 12% in controls.

Latency is inversely proportional to dose, whereas frequency is a function of dose, a threshold has been determined as between 0.2 and 0.8Gy. Infants are more sensitive and the disease is more progressive in the elderly. Some portions of the population are more radiosensitive and have an increased risk of developing cataracts. This discussion also raised the interesting question of whether the effects are deterministic or stochastic, the presence or absence is important as PSC does not fit easily into either.

The sensitive area of the lens is 2-4mm behind the cornea so the appropriate lens dosimetry is Hp(3). It is important that dosimetry is worn behind protection. Lead glasses are available but it is important to consider scatter from surrounding tissues as they have a significant contribution to the dose, so larger goggles are better. The threshold for a 1% risk of cataracts is considered by ICRP to be 0.5Gy for chronic or acute exposure which justifies the reduction in dose limit.

### **Development of Direct Ion Storage – Kip Bennett**

Mirion Technologies Dosimetry Services have produced sealed ion chamber dosimeters. These dosimeters can give immediate dose feedback via connection to a PC. These dosimeters allow you to closely monitor workers as there is no fixed time period and increase dose ownership of the work. The particular problem with conventional dosimetry is there is a delay in feedback and problems with on time return. As a dosimetry service Mirion reported returns as follows:

Monthly Badges, 60% returned in the correct month, 25% in the following month, 15% later than 2 months.

Quarterly Badges, 38% returned in the correct month, 38% in the following month, 24% later than 2 months.

This can be a real issue if an excessive dose has been received.

The DIS1 can be read by user and administrator, with flags for higher than normal doses. Approximately 20 years ago a military version was developed for use in the field which can give immediate feedback to the wearer. An internet based version, the Instadose 1, uses PC based reading with the results analysed by Mirion, but it still needs to be plugged into a reader. The Instadose 2 uses low energy blue tooth to get a read on a daily basis whenever the wearer places the badge on the base unit. This is very useful for analysis and dose investigation. With these kinds of dosimeters it gives ownership to the wearer and increases correct use.

The future for Mirion is the development of ring dosimeters using the same ion chamber technology, better battery management for longer useful life, smart readers which request reads when the dosimeter comes within 'reach' and dosimeters with neutron capability.

### **Safety related programmable electronic systems – Steve Gregory**

Modern programmable electronic systems (PES) are incredibly complex, with complicated control systems in even relatively simple pieces of equipment such as a handheld XRF. An example was given where PES failure had led to over exposures in the Therac-25 radiotherapy machines, due to overly complex software, poor operator interface and lack of testing.

Software is inherently complicated due to the architecture involved and it is often developed by external subcontractors who may not understand the context. Additionally it is impossible to test exhaustively due to the amount of code involved, a simple example that was given would require nearly 22 years to test all possibilities. Consequently it is very hard to be sure software is safe to use.

Hardware failures are of a probabilistic nature based on assessments of reliability etc. this is not suited to software failures which are systematic as defined in BS EN 61508-4 and the best approach is to demonstrate confidence that the probabilities of failure lie within certain acceptable boundaries.

The best way to achieve software safety is by appropriate testing following the generic standard of IES 61508 which introduces Safety Integrity Levels (SILS) based upon level of risk and reliance in the system.

This standard requires different levels of testing depending on the SIL. In the Nuclear industry all safety related PES undergo a thorough assessment (EMPHASIS) prior to use, requiring hundreds of questions to be addressed. The presentation concluded with a number of questions to ask manufacturers prior to using equipment, to ask an expert for advice as this is likely to have a negligible cost compared to serious injury and that if you spot a serious software bug to report it to the manufacturer and stop using the equipment until it is resolved.

### **Cosmic Radiation Exposures to Aircrew – Dr Graeme Taylor**

NPL is situated at Teddington and was established to test and verify instruments, construct and preserve standards of measurement and the determination of physical constants. Cosmic radiation is generated by supernovae explosions, approx. 1 in every 50 years, and consists of 85% protons, 10% electrons and other matter makes up the remainder. This cosmic radiation still accounts for 12% of the background dose at ground level and this figure increases by a factor of 200 at aircraft altitudes. Solar activity also has an influence as activity varies in a 22 year cycle by +/- 20% as solar wind has a protective effect against cosmic radiation. The solar maximum and minimum are in anti-phase with the doses measured at the ground. Neutrons are produced in quite large numbers at aircraft altitudes and account for half the dose to aircrews in a broad spectrum up to 100MeV. Also the doses increase the closer to the poles one flies due to the shape of the earth's magnetic field.

Occupational exposure of aircrews to radiation is a significant problem in long haul flights and can equate to ~4mSv/y, but long haul from Japan to UK has led to 6mSv/y and some aircrew have a higher occupational radiation exposure than a typical nuclear worker. Since May 2000 airlines based in the EU must assess the radiation exposure to aircrews. NPL were developing cosmic radiation detectors when they were contacted by Civil Aviation Authority to measure exposure and compare them to the output from dose calculation software. 3 different studies of aircrew exposure have taken place including a pole-to-pole study which gave a latitude profile of doses. A 'Hawk' Tissue Equivalent Proportional Counter (TEPC) was used to measure doses similar to a normal proportional counter but maximizes the doses from the counter wall. The TEPC has been built with materials to be an analogue of a tissue system using a percentage composition by weight equivalent to the ICRU tissue assuming the carbon for oxygen substitution is valid. The TEPC simulates energy deposition in a volume smaller than a human cell, and distinguishes between particles with different ionising densities. This enables the TEPC to have a broad ionising density spectrum allowing detection of electrons, protons and alpha particles plus heavy recoils, consequently the TEPC shows a good dose response for neutrons with energies of 60keV to 600MeV.

A graph of typical route doses for 85 flights during the 2000 solar maximum measured by TEPC showed a variety of doses for different routes from 65uSv for UK to Japan down to 25uSv for the equator crossing route to Johannesburg. When comparing TEPC measurements with the software estimations, CARI-6 and EPCARD gave a reasonably close estimation of the measured doses and airlines tend to use CARI-6 as it is free and reasonable accurate. The final part of the presentation looked at Solar particle events and Coronal Mass Ejection events on the doses air crews may receive, one of these events has yet to be captured in-flight by a TEPC and the software predictions disagree by a factor of 3 or more, but the exposures may increase 100-fold during CME.

**Reporter: Mark Earthrowl**

*RPO University of Southampton*

## **Wednesday Afternoon 9<sup>th</sup> September**

### **Update on the British Safety Standards (BSS) Directive – James Taylor (HSE)**

The BSS brings together five existing EURATOM Directives, consolidating them into one document. It was adopted by the EC on the 5<sup>th</sup> December 2013, with member states having until the 6<sup>th</sup> February 2018 to implement it. DECC have overall responsibility for the transposition, operating to a timetable which started in January 2014.

The aim of the transposition proposal is to copy much of the Directive into UK law without ‘gold plating’. Existing UK legislation will be updated / replaced where necessary, and any gaps between the Directive and existing legislation will be bridged in a practical and proportionate way. The HSE is taking the opportunity to update the Ionising Radiation Regulations 1999 (IRR99), and will probably produce a new piece of legislation e.g. IRR2018.

There are a number of potential changes which may need to be made. Of note is the Directive requirement to have a planned programme of routine inspections by regulators. Additionally, it will not be possible to demonstrate compliance with the Directive by following an Approved Code of Practice (ACOP). As such, some guidance which is currently contained in the ACOP to IRR99 may have to be transferred into the regulations.

The BSS Project Team at HSE is currently working with UK stakeholders, to ensure that the breadth of interested parties views inform the UK implementation of the Directive.

### **Visiting other employers and collaborative work – Mark Bradley (Oxford University)**

Mark Bradley gave an interesting talk on some of the issues he has faced dealing with University Staff who visit other institutions to carry out work with ionising radiation, as well as outside radiation workers who visit Oxford.

The Ionising Radiation Regulations 1999 require that where “work with ionising radiation undertaken by one employer is likely to give rise to the exposure to ionising radiation of the employee of another employer”, the employers need to co-operate with each other, exchanging any information which is required to ensure compliance with IRR99.

This co-operation is often frustrated where staff either do not inform their employer that they will be working with ionising radiation at another institution OR inform their employer at the last minute, leaving no time to make the necessary arrangements, or pass on any required information.

Sometimes the first that the University will hear of a member of staff visiting an external site, is when they are informed of an exposure.

Having a system which is easy for staff to use will improve the reporting of external visits and outside workers, and allow for basic information to be exchanged between the employers.

Oxford have implemented simple flowcharts which tell staff what they need to do before work can commence. They include instructions for offsite visits, movement of radioactive materials and portable x-ray generators and registration of outside workers.

### **The EMF Directive – Nigel Cridland (PHE)**

The Electromagnetic Fields (EMF) Directive 2013/35/EU aims to protect workers from the direct and indirect adverse effects of EMF's. Originally passed in 2004, a revised Directive was agreed and published in July 2013. The UK has until July 2016 to transpose the Directive into UK law.

The EMF Directive places a key duty on employers to assess the risks associated with exposure to EMF's in their workplace. It imposes a series of Exposure Limit Values (ELVs) which must be complied with, and a series of Action Levels which can be used to demonstrate compliance with the ELVs.

Article 14 of the EMF Directive requires that the European Commission produce a practical guide to implementing the Directive. Public Health England were awarded the contract, and aim to make the guidance available by 1<sup>st</sup> January 2016.

The guide will cover what employers need to do in a simple straightforward way. It is set out in four main sections:

- All employers – an introduction to the Guide and sources and effects of EMF.
- Deciding whether you need to do more, carrying out risk assessments.
- Compliance assessments- use of exposure limit values (ELVs) and action levels (ALs)
- Need to do more – implementing control measures.

It is supported by a number of detailed appendices, a second volume containing case studies and examples and a third simplified volume for SMEs.

At Universities, most EMF usage will not give rise to fields in excess of the Action Levels, and those that do will probably already be managed. The message of the guidance is that most employers will not need to measure or calculate exposure. It is, however, a good time to review the usage of possible sources of EMF within institutions and examine how they are being managed.

**Reporter: Tim Coldwell**

*RPO Hull University*

## **Non-Binding Guide to Good Practice for implementing Directive 2013/35/EU on Electromagnetic Fields**

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The Non-Binding Guide referred to above by Tim has now been issued and is available as a free download from the EU website. There are three parts, i.e., two volumes and a specific guide for SMEs.

The practical guide volume 1 provides advice on carrying out risk assessment and further advice on the options that may be available where employers need to implement additional protective or preventive measures.

[Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Volume 1 - Practical guide \(11/11/2015\)](#)

Volume 2 presents twelve case studies that show employers how to approach assessments and illustrate some of the preventive and protective measures that might be selected and implemented. The case studies are presented in the context of generic workplaces, but were compiled from real work situations.

[Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Volume 2 - Case studies \(11/11/2015\)](#)

The guide for SMEs will assist SMEs to carry out an initial assessment of the risks from EMF in your workplace. Based on the outcome of this assessment, it will help SMEs decide whether they need to take any further action as a result of the EMF Directive.

[Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Guide for SMEs \(11/11/2015\)](#)

The link to EC Rights at work, Latest additions webpage is:

<http://ec.europa.eu/social/main.jsp?catId=82&langId=en&furtherPubs=yes>

**Gus Zabierek**

**Chair – Scientific and Technical Committee/AURPO**

## HSE News

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Latest position regarding the revision of radiation protection directives including BSS and outside workers directives can be found at –

<http://www.hse.gov.uk/aboutus/europe/euronews/dossiers/radiationprotect.htm>

### ***When do I need to notify HSE?***

If you intend to start work with ionising radiation for the first time you need to let HSE know **at least 28 days before** you start work. This is a requirement of the [Ionising Radiations Regulations 1999 \(IRR99\)](#). The Regulations may also require additional notifications for certain occurrences and work practices, such as carrying out site radiography.

### **Starting work with ionising radiation for the first time**

If your work falls into any of the categories below, please click on the link to find out what you need to notify and to take you to the reporting form.

- If you are going to start work with ionising radiation for the first time, you are required to notify HSE at least 28 days before commencing work, unless your work falls into an exempt category. Details of the work that you do not need to tell HSE about can be found here (see [Work not required to be notified](#)).

Use form [IRR6 - Notification of ionising radiation activities](#) to notify HSE that you intend to start work with ionising radiation

### **Notifying changes to a previous notification**

- Radiation employers need to inform HSE when the details of a previous notification are no longer correct, such as when:
  - the employer's details or those of their premises change
  - the source category changes
  - the source is to be used at a different premises

For example, if an original notification covered the use of an X-ray set but you decide to start using radioactive materials, you would need to notify this change to HSE.

Changes to a previous notification - use form [IRR6 - Notification of ionising radiation activities](#)

- Planning to undertake site radiography Site radiography contractors need to give HSE at least seven days advance notification of the proposed work. For further information on site radiography, click her to visit the industrial radiography web pages.

Site radiography, use form [IRR3 - Notification of intention to carry out site radiography](#)

### **Other notifications required under IRR99**

Other reasons you may need to notify HSE under the IRR99 include:

- Nursing homes etc, when a patient has been given a radioactive medicinal product and are staying in, for example, a nursing home it is sufficient if notification is made by the nursing home as soon as practicable before the first instance of a patient arriving there.
- applications for individual prior authorisation to use electrical equipment intended to produce X-rays or use accelerators (other than electron microscopes) (see regulation 5)
- where a radiation employer suspects or has been informed that an overexposure has occurred (see regulation 25)
- notifications of certain occurrences such as losses, spillages or releases of certain quantities of radioactive substances (see regulation 30)
- where an employer suspects or has been informed that a person, while undergoing a medical exposure, was exposed to ionising radiation to a much greater extent than intended, as the result of a malfunction or defect in radiation equipment (see regulation 32(6))
- If you need to notify HSE or gain authorisation for any of these reasons please e-mail: [irrnot@hse.gsi.gov.uk](mailto:irrnot@hse.gsi.gov.uk)

*(The above are extracts from the HSE's website on work with ionising radiations – check out - <http://www.hse.gov.uk/radiation/ionising/index.htm> for further information)*

## **Safeguards Developments**

The UK Safeguards Office is still exploring possible ways to reduce/simplify the current criteria for reporting under the Commission Regulation 302/2005 for small holders of nuclear materials in the UK.

Over the last 18 months ONR safeguards has run a pilot with UK small holders of nuclear material (who are solely using depleted uranium) to create a UK national location outside facility (nLoF) of around 70 members.

The arrangement means that rather than report directly to Euratom, nLoF Members report to ONR to inform of their inventories including any changes or withdrawals. ONR compiles all the information received into a single overall master List of Inventory Items (LII) for the nLoF which is used to produce an Inventory Change Report (ICR) in January and July of each year, along with corresponding PIL and MBR reports.

The main benefits of the nLoF for members are that monthly reporting to Euratom has ceased, as ONR now report every 6 months (see above), and that information no longer has to be supplied to ONR in XML or via ENMAS Light – something that has caused historical problems for some operators.

This does not mean that operators are absolved of responsibility regarding nuclear safeguards reporting and records keeping. Members of the nLoF are still required to keep accurate and up to date local records of all nuclear material they have responsibility for in accordance with Commission Regulation 302/2005. This information is required during inspections by Euratom and visits by ONR safeguards officers and is required in order that data provided by ONR for nLoF reporting is accurate and can be substantiated.

The UK nLoF has recently completed its first PIT/PIV inspection with Euratom and following on from the success of this exercise ONR are seeking to explore the current experience of reporting for those small holders currently outside of the nLoF.

*I was asked for my feelings on potential benefits of expanding this method of reporting to include other small holders. However, I was not impressed. What has happened to the annual reporting under a derogation? ENMAS Light is not that difficult to use and stocktaking once a year is far preferable to doing it every 6 months. What they seem to be proposing will mean more work not less for those with a derogation.*

**T.J.Moseley, Univ of Sheffield**

## EA, DEFRA & DECC MATTERS

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The 45<sup>th</sup> SULG meeting was held on 8<sup>th</sup> December. The following are of interest.

The meeting was attended by Jo Nettleton, the 'new' (well, nearly a year ago, but relatively so) EA head of RSR business (nuclear and non-nuclear) at the Environment Agency. Jo gave a brief autobiography; she is a Medical Physicist by training, with previous extensive experience as an HSE radiation inspector, nuclear decommissioning inspector, dealing with COMAH as well as with Biological Agents. She stated her positive impressions of the EA to date. Nonetheless the EA is and will continue to be impacted by funding issues, including changes across DEFRA implemented by the Secretary of State for Environment Food and Rural Affairs (Liz Truss). The major EA RSR budget comes from charges and a charging review is beginning in April 2017, with consultation in 2016. 'Efficiencies' continues to be the watchword, but Jo emphasised that her role is to ensure RSR continues to be effective whatever the funding situation. You could of course say 'she would say that' but I found it encouraging that she was interested in attending the meeting and also has very relevant background qualifications and experience in ionising radiation issues.

### **Regulatory Reform Scotland**

An extensive presentation on changes to Radioactive Substances Regulation in Scotland was given by Isabelle Watson (SEPA). The proposed changes to implement the new BSSD requirements follow from the Regulatory Reform (Scotland) Act which became law in February 2014. This is an enabling act allowing Scottish Ministers to make further regulations. It gives SEPA a new statutory purpose, new enforcement measures and introduces a new offence of 'significant environmental harm' as well as giving new powers to the Courts. New technical regulations aim for a common framework for the four main regulatory regimes:

- Radioactive Substances
- Air/PPC
- Waste
- Water

A number of proposed regulations to implement BSS requirements were presented.

Worth noting were the proposed changes to Keeping and Use:

This includes removing the reference to premises, removing the need to define mobile apparatus, with Permits limiting the locations of use. It was proposed to adopt the term storage as an equivalent term to accumulation. A proposal to specify waste transfer as a regulated activity was also put forward to allay public concern, given that many premises dispose waste to a third party for final disposal.

Regulation could also apply to Production (eg cyclotrons, not nuclear reactors), receipt of waste (conditions currently can't be applied), Treatment (currently a disposal activity but could be an activity in its own right).

Regarding management of Radioactive Waste it might be possible to combine the storage, treatment and disposal of radioactive waste as a single management of radioactive waste activity (but excluding off-site transportation).

### **New Tiers of Authorisation**

The table below shows the proposed new (4) Tiers of Authorisation regarding the regulated use of radioactive substances.

Tier	Env Risk	Conditions	Ability to Refuse	Public Consult	Level of Assessment	Inspection Frequency	Revocation	Expiry
Permit	Higher	Standard Rules & Bespoke	Yes	Flexible	Complex	Routine (higher)	Any reason	Flexible/ Surrender
Registration					Simple	Routine (lower)		
Notification	Lower	Standard Rules	No	No	None	None	Yes	
GBR						None	No	No

The majority of RSA93 registrations and authorisations would be expected to become permits (as under EPR10); a minority would become registrations. GBR refers to General Binding Rules, where an activity is registered, but the risks are addressed by the terms of the Binding Rule, without the need for controls.

Other suggested ideas were the issuing of a 'Corporate Permit'. This would then apply to a university or health board but remove the need for multiple permits to cover different geographically separated parts of such an institute.

A final topic from this talk was the Simplification of the Exemptions. The current scheme has been cited as hard to understand with inconsistencies and contradictions, despite a recent review. Several approaches to simplification were presented.

It is simpler to show the proposals in the form of the original Tables – first GBRs.

Exempt activity	Specific Rules	Changes from current regime
Keeping, use and management of sealed sources $\leq 200$ kBq (max. total 200 MBq)	Disposal with ordinary refuse (max. 10 MBq per year)  Specific rules for Kr-85 (from lamps)	Max activity reduced from 4MBq to 200 kBq (above 200 kBq cannot be disposed with O.R.)
Keeping, use and management of specified H-3 sources $\leq 20$ GBq (max. total 5 TBq)	Disposal with ordinary refuse (max. 10 TBq per year)	Intended to combine (1) class A GTLD, (2) other H-3 sealed sources, (3) H-3 foil sources (4) H-3 luminised articles  Pm-147 luminised articles exemption deleted
Keeping, use and management of smoke detectors (affixed to buildings whilst in use) containing $\leq 40$ kBq (no max. total)	The smoke detectors must be affixed to the premises unless awaiting installation or disposal	Smoke detector limit reduced from 4 MBq to 40 kBq (standard for most smoke detectors) The big ones cannot be disposed with O.R.
Keeping, use and management of electrodeposited sources Ni-63 (600 MBq) or Fe-55 (200 MBq) (max total 600 GBq all RN)		Cannot currently be disposed with O.R. – candidate for Notification?

O.R. in the third column above refers to Ordinary Refuse.

The second Table relates to Notifications:

Notifiable activity	Specific Rules	Changes from current regime
<p>Keeping, use and management of Category 5 sealed sources.</p>	<p>TBC may be exactly same as sealed source GBR</p>	<p>Main benefit is that this deregulates cat 5 sources to notification.</p> <p>It also facilitates streamlining the other exemptions by providing a home for            Class B and C GTLDs,            Sealed sources &gt;200kBq but &lt; 4 MBq (they are currently exempt)            Smoke detectors affixed to premises &gt;40 kBq but &lt; 4 MBq            Possibly electrodeposited sources????</p>

As stated the main benefit here is the deregulation of cat 5 sources to notification.

The final Table relates to Registrations:

Registerable activity	Changes from current regime
<p>Keeping, use and management of radioactive substance that are solely radioactive due to the presence of NORM where, the NORM concentration exceeds 5 Bq/g but not 10 Bq/g, or where the concentration is less than 5Bq/g but the quantity requiring disposal by burial in a year exceeds 50 GBq</p>	<p>Moves from “exempt” to Registration but in practical terms there is no difference            Cannot be lower tier as they cannot be “refused”            Could be a PR issue for some companies</p>
<p>Keeping, use and management of radioactive substances when disposals are carried out in accordance with standard rules. i.e.</p> <ul style="list-style-type: none"> <li>• To a wpp</li> <li>• To sewer at the levels that are currently exempt</li> <li>• Adventitious gaseous disposals</li> <li>• VLLW replacement if required (OOS values deal with this but there might need to be something for items)</li> </ul>	<p>Idea is to make best use of the various disposal exemptions that have been suitably underpinned but that we don’t want to exist/ stand alone in the new regime.            Current disposal exemptions effectively turn into standard rules so a user can be guaranteed to get them without any assessment being required.            Focus turns to holdings and facilities rather than disposals</p>

Which of the above will be approved remains unknown, but they will be compliant with the BSS and are designed to not create any issues when wastes cross the border to other parts of the UK. 2016 will be a consultation period on the proposed regulations and the creation of SEPA guidance, with the Regulations coming into force in 2017. BSS implementation is in February 2018.

## **ONR Transport Update**

The update was presented by Anna Mayor, ONR Principal Inspector for Transport.

The most important announcement was approval on December 4<sup>th</sup> of the Authorisation allowing consignors to dispose of radioactive waste containing very low levels of activity (EPR dustbin limits) using the public refuse collection service without reference to the regulations covering the transport of radioactive material. This represents the resolution of a long standing problem. The Authorisation form will shortly be available on the ONR website.

Some of the issues found at inspections were summarised at the previous SULG meeting. Deficits in Emergency Arrangements found at inspections (procedures, testing, training) are being addressed, with ONR providing guidance for duty holders (and inspectors).

One big issue for ONR is reaching the large number of organisations involved in transport of radioactive materials. The latter aren't required to register with ONR, and gathering this information is intelligence-led, using EA/SEPA permit holder lists, DfT and inspection findings. One finding was that there was often no dose assessment by the carrier and no assignment of a Transport Index. These findings reflect a lack of access to competent advice from a DGSA/RPA. A stakeholder engagement strategy is being developed, with the identification of:

- Duty holders and their needs
- Intermediaries and influencers (Regulators- HSE/EA/DfT, Enforcing authorities- Police/ Border Force, Associations (SRP/IPEM/AURPO)
- Resources and channels to aid compliance ( Guidance/Website/Stakeholder event)

Regarding security, a number of problems were identified from Inspection findings:

- Lack of understanding/ awareness by consignors and carriers
- High Consequence Dangerous Goods (HCDG) thresholds (eg Ir-1920.8TBq, Am-241 0.6 TBq)
- Enhanced security measures/prescriptive security plan
- Consignors not flagging HCDG to 3<sup>rd</sup> party carriers
- Carriers not intelligent customers for HCDG
- Consignor/carrier interface
- Is the carrier who you are expecting?
- Drivers carrying photo ID
- Temporary storage
- Training

ONR will liaise with other regulators to avoid over regulation, share inspection dates and information gained during inspections. They are also proposing joint inspections 2016-17 with other regulators.

ONR enforcement options are outlined at <http://www.onr.org.uk/documents/2014/enforcement-policy-statement.pdf>.

*See also Transport News on page 20.*

## **DECC Update**

Colin Mackie gave an update on the public exposures workstream of the BSSD Implementation Programme Model with the BSS implementation deadline of February 2018. Following a full 'gap analysis' technical work is now underway on e.g. clearance (*as discussed in the last newsletter*) and exemptions. Available options are to do nothing, provide different types of guidance or transposition through legislation. Options will be tested through feasibility, impact assessment, informal stakeholder consultation and full public consultation.

Operators of scrap metal recycling facilities/metallurgical operations will be required to inform the environmental regulator of any melting/damage to an orphan source. Waste regulations will require a change in EPR10 to allow a condition in the corresponding environmental permit. General awareness of orphan sources must also be raised with guidance for dealing with such a source and advice/assistance for those who believe they have an orphan source.

In defining HASS the BSSD uses IAEA D-values rather than the current A-values. It was estimated that using D-values around 400 sources would be unclassified as HASS, but most belong to permit holders who have other HASS sources. Conversely less than 10 sources would now become HASS.

HASS sources will be unclassified as HASS on decaying below the IAEA D-value. However this is only likely to affect Yb-169 sources ( half life 32 days).

Values for many IAEA radionuclide exemption and clearance levels are unchanged as discussed in the last newsletter but some are more restrictive eg tritium, C-14, Cs-137, I-125, I-131 and Ra-226. PHE is investigating the options for implementation of the revised values. It may be possible to use higher values for specific applications.

Next steps in the process involve various discussions, consultations and engagement with EU partners to address potential problems. The next key milestone is a stakeholder workshop in July.

## **Environment Agency Update**

*Strategic review of charges* - A review of various charging regimes is ongoing, with a public consultation next summer preceded by stakeholder/customer consultations. There will be no changes to charges before April 2017.

*Security* - Drafting of a new version of the Security Book will begin soon. Consideration will be given to moving all operators to the newer (and future) standards in a 'reasonable' time frame. There was discussion about the frequently mentioned possible re-scoping of the regulation to cover high activity open source work. SULG members were certainly not clamouring for this to happen and there seems to be little momentum for this to progress, especially given the current budget constraints.

## **Theft of a nuclear density gauge**

A nuclear density gauge (Am241/Be source) was stolen from a remote storage location in Sussex, along with other items. It was safely recovered within a few days. This incident highlighted the

importance of robust security measures for such sources at remote/unmanned locations. The meeting was asked to highlight this incident to the small user community.

### **Radioactive waste advisers**

All waste accumulation and disposal permit holders were issued with an amendment in early 2014 requiring 'consultation with suitable Radioactive Waste Advisers'. RWA grandfather rights expire 30<sup>th</sup> June 2016 and after then permit holders must ensure they have appointed suitable RWA(s).

### **Small User issues/Members items**

Mike Lockyer introduced a paper on the subject of 'Dormant Permits and Permit Parking'. This followed from discussions with Andy Hancock, an RPA for UCL, who put forward these ideas.

Issues:

- An operator may have a permit for several years, not using sources yet still paying subsistence charges
- This may additionally result in needless inspections (a waste of both the Operator's and EA Inspector's time)
- An operator with a Dormant Permit would still be expected to make annual PIEDC returns
- Management arrangements may change during the idle period
- The Operator may not always be aware of their responsibilities
- An Operator with a Dormant Permit may restart work with sources without fully being able to comply with or unaware of the limits, possibly without an RWA appointed

Suggestions:

- If an Operator has not used open sources, and has no waste sources for 12 months (and has no plans to use sources in the foreseeable future). Permit Parking may be applied for
- For a fee, dependent on Permit complexity, an Operator can apply to park their Permit for an unspecified period (not exceeding 5 years)
- A Parked Permit would not incur subsistence charges and all relevant conditions and limitations would no longer apply. The Operator would be responsible for ensuring that premises are free from residual contamination and safe for use
- An Operator would be in breach of the EPR regulations if they use open sources under a parked permit, in excess of exemption levels. Normal exemption rules regarding use of the EO for open sources with an open source permit would not apply under Permit Parking
- To 'unpark' a permit with the intention of using open sources again the Operator must apply in writing to the EA with a minimum 28 day notice period of their intentions and make a declaration to the effect that they will be able to fully comply with permit conditions and limitations when they begin using open sources again. Only minimum details will be required (no complex application form/process) although an 'unpark' date should be agreed with the Operator and EA
- There would be an application fee, equal to that for a new permit
- The Permit would now be subject to a full inspection regime and subsistence charging

- If a Permit remains parked for 5 years, the EA will demand surrender of the Permit within a timeframe as agreed with the Operator, but not exceeding 12 months

A similar process already applies to landfill permits. The ideas were favourably received and the EA will further explore the practicalities/ possibilities.

**Mike Lockyer 15/12/2015**

## **TRANSPORT NEWS**

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*News from ONR Transport Inspection & Enforcement (TIE) provided by Lindsey Cairns 16/12/2015*

### **1 Authorisation news**

*My last update in June this year mentioned that an authorisation was being drafted under Regulation 12 of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG) to remove certain sources that could be disposed of via normal refuse, from transport regulation subject to particular conditions. This work was completed recently and Authorisation No.500 came into effect on 4 December 2015. AURPO SULG/SNNILG representatives have been provided with copies of the authorisation ahead of it appearing on the ONR Transport web-pages shortly.*

### **2 Recent work**

*Inspectors have presented at both the October 2015 SNNILG meeting and December 2015 SULG meeting, updating members on current work being carried out by the team, findings from recent inspections and stakeholder engagement activities. The associated power point presentations are available from your AURPO representatives.*

*Recent inspection experiences have highlighted that emergency arrangements are lacking, and are typically not being tested by CDG dutyholders. Further guidance is being prepared to help dutyholders to understand ONR's expectations in relation to the requirements of Regulation 24 and Schedule 2 of CDG. It is anticipated that this will be made available via the ONR Transport webpages in early 2016.*

*Generally, inspectors have found that amongst consignors and carriers there is a lack of awareness of Class 7 high consequence dangerous goods thresholds (HCDG) as detailed in ADR 1.10. Enhanced security measures and a security plan are required where dutyholders are engaged in the carriage of HCDG.*

### **3 ONR publications**

*ONR web-based publication 'Quarterly News' is no longer, having been replaced by 'Regulation Matters', the first edition of which came online in August 2015. If interested, AURPO members can subscribe to this publication via ebulletin (via the ONR homepage: <http://www.onr.org.uk/> and enter your email address into the box.) The next edition, expected later this month, will feature a transport article - ONR's 'Regulation matters' December 15 edition is now out <http://www.onr.org.uk/documents/2015/regulation-matters-december-2015.pdf>*

### **4 Staffing**

*Michael Nettleton (previously of HSE) joined TIE in September 2015.*

## NEWS FROM PHE (HPA- Radiation Protection Division)

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Relevant PHE publications since the last newsletter.

### **Radiation Recovery Navigation Tool: Inhabited Areas**

This tool is designed to guide users through the 8 step process used in the UK Recovery Handbook – check out the web page for further details.

[http://legacyassets.phe.org.uk/tools/CRT\\_elearning/radiation\\_inhabited.html](http://legacyassets.phe.org.uk/tools/CRT_elearning/radiation_inhabited.html)

### **Radiation Recovery Navigation Tool: Drinking water supply**

Similar tool to above for drinking water supply.

[http://legacyassets.phe.org.uk/tools/CRT\\_elearning/radiation\\_water.html](http://legacyassets.phe.org.uk/tools/CRT_elearning/radiation_water.html)

### **Radiation Recovery Navigation Tool: Food Production Systems**

Similar tool to above for food production systems.

[http://legacyassets.phe.org.uk/tools/CRT\\_elearning/radiation\\_food.html](http://legacyassets.phe.org.uk/tools/CRT_elearning/radiation_food.html)

### **Health Risk to Seafood Consumers from Radioactive Particles in the Marine Environment near Sellafield**

This report assesses the health risk associated with radioactive particles in the marine environment near Sellafield.

[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/453895/PHE-CRCE-021.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/453895/PHE-CRCE-021.pdf)

## **TRACERCO NEWS - Radiation Monitors & Servicing are moving...**

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The Tracerco Radiation Monitor calibration team, will soon be moving into the new Tracerco Measurement Technology Centre. The 61,000 sq ft custom-made facility has been built to enable Tracerco's skilled Research and Development team to more efficiently bring new innovative technologies to help you with your most challenging radiation monitoring needs.

The calibration and repair services will be moving on the 10th November, so all monitors sent in for calibration or repair should be forwarded to the new location from this date.

Services will not be interrupted by the move, and if you have any queries regarding this, please do not hesitate to contact a member of the customer services team on 01642 375171. Our new address is as follows..

Measurement Technology Centre  
The Moat  
Belasis Hall Technology Park  
Billingham  
TS23 4ED



To coincide with the move, Tracerco's Monitors and Servicing department has been rebranded to 'Sensor Technologies', as we aim to integrate, and utilise our unique expertise in Chemistry, Physics and Instrumentation, to develop technology which delivers exceptional performance in detecting, measuring and monitoring radiation dose rate.

## NEWS FROM PYCKO

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### New obsolete and hard to find parts replacement/repair service

Pycko Scientific Ltd have launched a replacement parts and mechanical engineering service.

With a wide ranging capability to manufacture, recondition and even redesign mechanical parts this new service could be the solution to expensive instrument and component replacement.

- Pycko & their established supplier have over 25 years of design and engineering experience on which to draw and are able to produce quality workmanship in a timely manner and at an affordable price.
- With capabilities in machined and turned metal work, sheet metal work, plastics, polymers, connectors and fittings Pycko are offering a new lease of life to worn and unloved equipment.
- Manufacture of semi consumable parts, remanufacture of parts in alternative materials i.e. stainless steel for plastic and an honest “does it work” service for instruments.
- Obsolete equipment can be rejuvenated with interfaces to new modern displays, and upgrades to existing equipment to bring them back to functionality.
- Specialist skills in very fine Platinum wire welding down to 10 microns such as is used in corona discharge devices.

An initial assessment on the viability of production is free. Following this and depending on the complexity of a component, a minimum charge of approx. £100 to £500 will be levied to produce an assessment of replacement component cost. Replacement component cost will be from a minimum of £100 each, reduction on the initial item cost may be possible if the component is later required in large volumes.

Please send all enquiries to:

[bill@pycko.co.uk](mailto:bill@pycko.co.uk)

Please include a brief description of the work required and images if available.

*Please note this is not a calibration or validation service.*

**Bill Snooks. B.Sc., MSRP.**

**Managing Director.**

**Tel: 0115 911 0239**

**Email: [bill@pycko.co.uk](mailto:bill@pycko.co.uk)**

## BOOKS AND PUBLICATIONS

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### New and revised standards

[IEC 60846-2:2015 PRV](#) Radiation protection instrumentation - Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 2: High range beta and photon dose and dose rate portable instruments for emergency radiation protection purposes

[IEC 61017:2015 PRV](#) Radiation protection instrumentation - Transportable, mobile or installed equipment to measure photon radiation for environmental monitoring

[IEC TR 62971:2015](#) Radiation instrumentation - Radiation sources used in illicit trafficking detection standards - Guidance and recommendations

[IEC TR 60825-17:2015](#) Safety of laser products - Part 17: Safety aspects for use of passive optical components and optical cables in high power optical fibre communication systems

### ICRP

**Stem Cell Biology with Respect to Carcinogenesis Aspects of Radiological Protection** ICRP Publication 131 Ann. ICRP 44(3/4), 2015

#### **Occupational Intakes of Radionuclides: Part 1**

ICRP Publication 130 Ann. ICRP 44(2), 2015

Radiological Protection in Cone Beam Computed Tomography (CBCT) ICRP Publication 129 Ann. ICRP 44(1), 2015

### Health Physics 2015-16

#### *September issue includes:*

#### **Laser Safety Program Development at Texas A&M University—Issues and Challenges**

Vasudevan, Latha; Menchaca, Daniel I.; Tutt, James

#### *November supplement issue includes:*

#### **Attenuation of X and Gamma Rays in Personal Radiation Shielding Protective Clothing**

Kozlovska, Michaela; Cerny, Radek; Otahal, Petr

#### **Occupational Exposure to Veterinary Workers from the Positron Emission Tomography Imaging Agent <sup>64</sup>Cu-ATSM** Hetrick, Lucas D.; Kraft, Susan L.; Johnson, Thomas E.

#### *January 2016 issue includes:*

#### **Radiation Monitoring for the Masses**

Wagner, Eric; Sorom, Rich; Wiles, Linda

## **Journal of Radiation Protection 2015**

### ***March issue includes***

Measurement of occupational doses of ionising radiation to the lens of the eyes of interventional radiologists: Anthony Higgins

### ***December issue includes***

Generally applicable limits on intakes of uranium based on its chemical toxicity and the radiological significance of intakes at those limits: M C Thorne and J Wilson

The advantages of creating a positive radiation safety culture in the higher education and research sectors - T Coldwell, P Cole, C Edwards, J Makepeace, C Murdock, H Odams, R Whitcher, S Willis and L Yates. A copy of the article can be found here -

<http://iopscience.iop.org/article/10.1088/0952-4746/35/4/917/meta;jsessionid=4401367344BF1431D23EE9F3707B7EFC.c4.iopscience.cld.iop.org>

### Radiation Protection Culture Paper Published

A paper entitled "The advantages of creating a positive radiation safety culture in the higher education and research sectors" is to be published in the Journal of Radiological Protection, Volume 35, Number 4.

## **IAEA Safety Standards**

### **The Fukushima Daiichi Accident**

The Fukushima Daiichi Accident consists of a Report by the IAEA Director General and five technical volumes. It is the result of an extensive international collaborative effort involving five working groups with about 180 experts from 42 Member States with and without nuclear power programmes and several international bodies. It provides a description of the accident and its causes, evolution and consequences, based on the evaluation of data and information from a large number of sources available at the time of writing.

<http://www-pub.iaea.org/books/IAEABooks/10962/The-Fukushima-Daiichi-Accident>

### **Worldwide Implementation of Digital Imaging in Radiology**

#### **IAEA Human Health Series No. 28**

This publication provides a basic introduction to digital technology and digital networks as well as an overview of the issues to consider when implementing such technology in diagnostic radiology. In an area that is under rapid development, it provides a careful analysis of the principles and advice on implementation and sustainability of digital imaging and teleradiology. The transition from film to digitally based medical imaging is complex and requires knowledge and planning to be successful. This comprehensive resource guide contains information on the needs and implications of a transition to digital imaging with case studies for different facilities requiring different levels of communication connectivity. It is aimed at hospital administrators and managers, radiologists and radiographers/technologists, medical physicists and clinical engineers as well as information technology staff.

<http://www-pub.iaea.org/books/IAEABooks/10613/Worldwide-Implementation-of-Digital-Imaging-in-Radiology>

### **Quality Management Audits in Nuclear Medicine Practices, Second Edition**

### **IAEA Human Health Series No. 33**

Quality management systems are essential and should be maintained with the intent to continuously improve effectiveness and efficiency, enabling nuclear medicine to achieve the expectations of its quality policy, satisfy its customers and improve professionalism. The quality management (QM) audit methodology in nuclear medicine practice, introduced in this publication, is designed to be applied to a variety of economic circumstances. A key outcome is a culture of reviewing all processes of the clinical service for continuous improvement in nuclear medicine practice. Regular quality audits and assessments are vital for modern nuclear medicine services. More importantly, the entire QM and audit process has to be systematic, patient oriented and outcome based. The management of services should also take into account the diversity of nuclear medicine services around the world and multidisciplinary contributions. The latter include clinical, technical, radiopharmaceutical, medical physics and radiation safety procedures.

<http://www-pub.iaea.org/books/IAEABooks/10714/Quality-Management-Audits-in-Nuclear-Medicine-Practices-Second-Edition>

### **Staffing in Radiotherapy: An Activity Based Approach**

#### **IAEA Human Health Reports (CD) No. 13**

Radiotherapy requires competent professional staff to ensure safe and effective patient treatment and management. There is a need to provide guidelines that recommend appropriate staffing levels to support the initiation of new services as well as the expansion or upgrade of existing services as even simple upgrades or replacement of existing equipment may have a significant impact on staffing needs. Similarly, the introduction of education and training programmes will require staffing adjustments. A calculation algorithm was developed to predict staffing levels based on the inputs that are known or can be easily estimated. This publication complements other IAEA publications used to support the initiation of basic radiation medicine services including Setting up a Radiotherapy Programme: Clinical, Medical Physics, Radiation Protection and Safety Aspects, published in 2008.

<http://www-pub.iaea.org/books/IAEABooks/10800/Staffing-in-Radiotherapy-An-Activity-Based-Approach>



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