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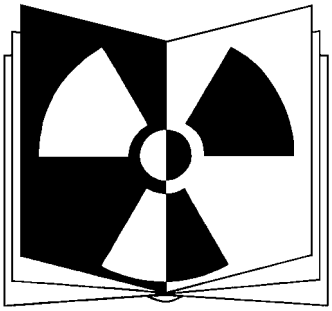

A.U.R.P.O

NEWSLETTER

June 2004

Association of University Radiation Protection Officers

AURPO NEWSLETTER

June 2004

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President's Report

Yet another Academic year almost through and that time again to think if going to stay on committees/pack-up and retire from it all/carry-on, I admit the second has great appeal to me these days. We do need fresh faces on our committees, please do consider it seriously-you will find it useful and we need your ideas and help.

Preparations for the AGM in Belfast proceed well, do come and support the meeting, access is easy and can be very cheap. Unfortunately this year it has clashed with other meetings which caused some hiccups in getting speakers. The social side is excellent and the hotel good.

Christine and I attended IRPA11 in Madrid as members of the UK delegation. The UK presented its bid to hold IRPA12 in 2008 in Glasgow. The presentation was excellent but it went to Argentina - there was a lot of 'trading' and politics going on beforehand. On the plus side we did get Bobby Corbett elected to the IRPA Executive Council for the next four years. The meeting this was all decided in lasted seven hours until 1930 and all were exhausted - no coffee and limited breaks between voting. Probably the main talk of the Congress was by Roger Clark, President of ICRP, on ICRP's latest draft of thoughts on a replacement for ICRP60, this can be found on several websites and a full Consultation Document is due out soon to which we can respond as an Association. Some of the organisation of the meeting was not the best e.g. they ran out of holders for name-badges, enquiry desks shut at lunchtime when people were not in lectures and also it rained a lot whilst the UK basked in the sun!

I also attended the ICNIRP congress in Seville just before and the proceedings will be on it's website.

Applications have poured in to RPA2000, used to be 8-10 a month but 71 in March. Assessors have increased 50% but there is great pressure on them at present. I missed their recent meeting at which the HSE attended to talk about removing some inconsistencies in the HSE Statement on RPAs. Any changes will go out to consultation and of course I will keep you informed. Remember, if you are applying for Certification you must follow the Portfolio guidelines.

The HSE Forum i.e. it's liaison meeting with stakeholders, was due on the 9th June but has now been postponed until October due to lack of items for discussion put forward - if you have any matters to raise on the Regulations do pleases let me know.

Finally my thanks to Christine for her hard work in producing the Newsletter again.

Tony Richards
June 2004

ANNOUNCEMENTS

43rd Annual General Meeting of the AURPO

In accordance with Section 6(a) of the Constitution, notice is hereby given of the above which will be held at 16.30 on Tuesday 7th September 2004 at Queen's University, Belfast. Any motions, duly proposed and seconded must be received by the Secretary by Monday 9th August 2004. All papers will be available at the meeting.

D Hague
Honorary Secretary

Call for nominations for Membership of the Executive Committee And its Standing Committee(s)

Nominations are invited for membership of the Executive Committee of the AURPO. This Committee consists of President, Secretary, Treasurer and five other members of the Association.

Nominations are also invited for membership of the Technical Co-ordinating Committee.

All nominations, proposed and seconded, must be received by the Secretary by Monday 9th August 2004. If necessary a Returning Officer will be appointed for all elections.

D Hague
Honorary Secretary

AURPO Annual Conference, 2nd – 4th September 2003
Heriot-Watt University, Edinburgh

The AURPO Conference at Heriot-Watt University in Edinburgh was a great success enjoyed by all who attended. Those who were there will carry their own memories of the tour of Edinburgh Castle, the whisky tasting, and of the conference dinner. Below we provide a report on the presentations which made up the conference itself. AURPO are grateful to Niall Higbee, David Hornsey and Peter Marsden for their respective reports for each of the three sessions.

Session 1: 2nd September (pm)

Training Course Contents for Different Groups

Prof George Gordon, Centre for Academic Practice, University of Strathclyde

This paper was well placed as the first paper at the conference to make speakers wonder how much of their paper participants would remember when they went home! According to William Glasser people learn about 10% of what they read, 50 % if they can see and hear the material (lectures with slides, power Point?). This will rise to 70% if people can talk over materials with others. Interaction and participation improves learning. Prof. Gordon gave an example of the AURPO-Strathclyde Certificate Course where he thought that the virtual classroom was very important in stopping students becoming isolated. He thought that PC simulation exercises would be a good addition.

Prof. Gordon advised us to know our audience! The learning goals may be set but we should tailor our training according to the knowledge base and our trainees preferred learning style. We should always access behaviours! He quoted from Honey and Mumford learning styles, Activists learn by doing, Reflectors only after thinking for a period of time. A Theorist will have an obligatory need for the facts but for a Pragmatist, theory will be of little help! Howard Gardner has expanded the term Intelligences to a wide range of attributes (linguistic, numerical, interpersonal etc.). Occupational groups may be strong in various clusters of these intelligences. So Prof. Gordon suggests that your awareness of the differing intelligence clusters should inform and influence your training course. After all knowledge comes in different flavours, professional knowledge is functional specific and pragmatic. Academic knowledge is declarative, abstract and conceptual. The leaning style for a Scientist may be different to that of a Secretary. Other student based factors such as ability, commitment play a role here along with the ability to concentrate and personality types i.e. introvert/extrovert.

Prof. Gordon admits that the lecture has its place, points are clarified and misconceptions can be corrected but does this steam of facts captivate your radiation workers? He invites us to consider peer directed groups (Buzz groups) or self directed exercises. Peer directed groups are useful to broaden understanding, provide different viewpoints and obtain insights with others like oneself. Self directed activities are useful for developing in depth understanding, monitoring and independent learning. (John Biggs, 2003).

Good principles for practice include a well structured knowledge base with an appropriate motivational context with activities for the learner, preferably with interaction with others. The structure helps correlate feedback and the activities can

use error in a constructive way. Most people accomplish a list of increasingly more difficult sets of tasks, building upon what they know, which Prof. Gordon terms "Constructive alignment". The learner responses may vary from manipulating unstructured facts without answers to mastering extended abstract knowledge.

So how much of this review will you remember?

Contingency Plans
Don Morecombe, GSK

Don Morecombe's paper first of all underlined the regulatory situation. IRR99 Reg 7 (1, 2 and 3): requires: - prior suitable and sufficient risk assessments, identification and prevention of foreseeable accidents or their consequences, and providing information, instruction, training and equipment. Reg 12 (1): requires a contingency plan to restrict radiation exposure and secure health & safety. The HSE Guidance 207: calls for a plan of correct course of action and training of those identified in plan. Guidance 210: integrates the role of the emergency services into the plan (e.g. fire). Reg 12(2): calls for rehearsals of plans to be carried out at suitable intervals. Guidance 215: indicates that rehearsals should be dependent on potential severity, likely doses, complexity, number of people involved and reflect on the involvement of emergency services. Guidance note 2.05 suggests that training must be "as appropriate" and "practical".

GSK Research and Development has a generic contingency plan which fits in the corporate emergency health and safety standards. Emergencies are simulated and staff practice responding to them, results are evaluated and the implementing of any improvements are audited. Scenarios have included: fire, spillage of radioactivity featured in the early exercises, external exposure and external and internal contamination. GSK with Ambulance Services emergency planning officers will perform a full rehearsal during 2004 with a full involvement of receiving hospital(s). The rehearsal plan has the scenario of personal contamination and injury in the worst case up to 3 victims.

The RPS has a key role in accident management and it is important that they are well trained. RPS's are trained by PIRSDG RPS training courses at SRTS Ltd., GSK also runs annual RPS refresher training incorporating an exercise with the scenario of personal injury and contamination.

The combined personal injury and contamination exercises were successfully run at University of Strathclyde, in March 2003 and during the current conference. (Neil Utting, Alan Muir & Don Morecombe). The exercises ran with the following roles: - one RPS (and deputy), three workers, one victim and one First-Aider on call. There is a standard Amersham spill kit and a monitor available. The RPS and First-Aider attend to initially and find the victim and realise that there is contamination of the lab and personal contamination of the victim. Twenty people participated. There were three groups, each with a different radionuclide causing the contamination.

Don then suggested RPS actions. The RPS must take control of situation and take stock of situation in order of priority: - personal injury, personal contamination and area contamination. Secondly, the RPS must call for assistance and alert others other workers; RPO and First-Aider. Correct PPE for the RPS and First-Aider should be worn. The RPS should stop further spillage and cordon off the contaminated area (3 x

observed area of spill). Not forgetting the victim, the RPS must deal with personal injury immediately in conjunction with first aider but should try to remove the victim from immediate source of contamination, if appropriate. Next, the RPS should then deal with personal contamination as soon as possible, (use of soapy water and by removing contaminated clothing with scissors).

For the next step, the area (an area larger than the observed spill area) should be decontaminated, work inwards using the spill kit until the monitoring indicates that the surface contamination is at an acceptable level. After which all that remains is to collect all waste (labelling the bags.), dispose of the waste and inform the RPO and complete the safety report.

Don ran a feedback session later that day, where there was a presentation of 'Oscars for Best Actor' and everyone agreed that the exercises were extremely valuable.

Session 2: 3rd September (am)

New Laser Standards – Laser Safety Update
Gus Zabierek, University of Birmingham

The UK's committee for optical radiation safety and laser equipment is EPL/76 and their deliberations are published by BSI and are readily available online (if you subscribe). In Europe, the two bodies involved are CEN and CENELEC. Both are committees for standardisation, the latter being particularly associated with matters electrotechnical. On a global basis, the International Electrotechnical Commission (IEC) and the International Organisation for Standardisation (ISO) represented by 90 countries develops the standards that effectively both the UK and Europe follow. Hence consistency is achieved internationally. The production of the international standard is a long (~ 6 years), 7-stage process and BSI's deliberations on IEC's 60825-1 has resulted in the recent and important publication BS EN 60825-1, 1994. Although published in 2002, for some obscure reason, it still retains its original date.

The main changes for laser users are the addition of three new laser classes (1M, 2M and 3R). These supplement the existing 1,2,3B and 4. The 1M and 2M, although under the class 1 & 2 umbrella are considered more hazardous particularly when magnifying optics are used in the beams. The Class 3R, although hazardous on intrabeam viewing carry a lower risk than Class 3B and hence require less control measures. The warning signs have also been reworded.

A review of the now dated CVCP Guidance is underway with NRPB taking the lead in the collaboration and will probably be on our PCs by the middle of next year. It will be Internet based with downloadable documents.

The contentious issue of eye examinations for laser workers was addressed by Gus who confirmed that it is only necessary when using Class 3B/4 lasers and is usually carried out for medical/legal reasons only. Interestingly, in the 2001 Hasnet-rad survey, 31% of institutions still carry out routine ophthalmic examinations using pupil dilatory drugs and flash photography even though there is evidence that it may cause photochemical damage.

Risk of Non-Ionising EM Fields in Research Institutions
Graham Hart, Bradford Hospitals

In about 30 minutes, Graham covered a great deal of ground dealing with the basic science of EM fields, biological effects and the measurement of EM fields. There is an increased awareness from the HSE for EMFs and although the subject is highly complex, both Guidance and Legislation is on its way. The real problem is ascertaining the biological effects of exposures to the range of frequencies encountered. Apart from the obvious effects of core temperature rises of $1 - 2^{o}$ C from 100 kHz - 300GHz fields that can cause thermoregulatory problems as well as contacts with metal objects in these high frequency fields causing shocks and burns, the problem of increased incidence of such conditions as brain tumours, leukaemia etc as a result of induced current flows within the body is particularly contentious. The ICNIRP Guidelines recommend a precautionary approach using the ionising radiation equivalent of ALARP or the restriction of access to any EMF field. The proposed EU Directive will again promote this precautionary approach of avoidance but will also include Exposure and Action Levels above which precautionary actions must be implemented. As Arwel Barrett commented in the discussion of the presentation any action levels are only updated after a very long-winded process. This is not surprising because when it is difficult at times to ascribe a hazard to an EMF source, risk assessment is inevitably problematical.

Management of NMR and large DC Magnetic Fields
Peter Cole, Liverpool University

After the coffee break Peter gave an absorbing and at times humorous (in a macabre way) presentation on the human problems of dealing with large super-conducting magnets. Any piece of Ferro metal can become a lethal missile in the vicinity of such magnets and examples of the forgotten pair of scissors in a surgeon's pocket to the aneurysm clips installed in a patient illustrated the damage that can be caused by the attraction of such metal to the magnet.

However, apart from the obvious injuries from such moving pieces of metal, the biological injury caused by magnetic fields in excess of 2 Tesla is still controversial and like the conclusion of the previous paper, the precautionary principle is followed. For example although there is no evidence of detrimental effects to the foetus in pregnancy from such fields, resonance imaging is never conducted until 3 months after conception and all pregnant staff are excluded from a controlled area where fields of 3 mT can be experienced. This appears to be a common policy for non-ionising radiations in that because the possible biological effects are still contentious, precautions will be adopted as if they are hazardous until evidence proves otherwise. It is, of course, impossible to prove a negative.

Management of Accelerators and Radiation Generators
Paul Wright, Rutherford Appleton Laboratory

Moving now into Ionising Radiation, Paul mainly restricted his presentation to ISIS, the pulsed neutron and muon source at the Rutherford Appleton Laboratory near Oxford. Energies of up to 800 MeV neutrons and 50 MeV muons are involved and although the Management aspect of the talk gave us insight into the scale and complexity of the organisation that has thousands of visiting researchers working with these high radiation fields, it was its Operational Radiation Protection strategy that

was of particular interest to the Conference. The obvious costs involved for the installation of the extensive hardware shown on Paul's slides and the demand for its facilities by researchers investigating the fundamental structure of materials, places particular stress on the exhaustive use of an effective Radiation Protection programme using Local Rules, Written Systems of Work and Permits to Work. Although the main experimental hall is a cushioned radiation environment with doses of only 2 x 10^{-3} – 1 x 10^{-2} Gy/h, most of the other accessible areas, such as workshop and materials store can have doses of up to 1 – 10 mSv/h. With numerous unclassified workers, the operational hazard control system developed through a comprehensive management control ensures that the annual doses for the majority of employees and visitors lies between 0.01 – 0.5 mSv /annum with very few in the 2 – 3 mSv range. For the visitors, the majority receive no dose as most of us can probably vouch for when we receive the dose records of own staff that have returned from a period working with the beams. As a result of the laboratory's activities, the committed dose to the public is less than 1 μSv/annum.

Advisory committees: their roles in Radiation Protection
Wynne Davies, Amersham

The final session of the morning gave us a useful insight into the complex of committees involved in Radiation Protection by someone very much involved in a lot of them.

The Ionising Radiations Advisory Committee (IRAC) was the instrumental body responsible for IRR 99, BSS negotiating and REPPIR, together with the vital, contentious task of assessing the public's perception of risk. This latter item makes a major contribution to the decisions on the formulation of the Regulations. An important development has been the establishment of the Ionising Radiation Health and Safety Forum to provide a liaison between the HSE and Stakeholders. Over 30 members of the Forum, drawn from CBI, TUC and government departments had their initial meeting on 7th July 2003 with the prime aim of setting up an electronic discussion forum. Tony Richards is AURPO's representative on the Forum and Wynne encouraged us to feed ideas and comments into the Forum via Tony. Wynne stressed the importance and need for this form of access to the HSE to either contribute to its thinking or initiate ideas to be considered.

The Radioactive Waste Management Advisory Committee (RWMAC) with its large spectrum of experts in the field was set up to advise the Secretary of States on policies to deal with all forms of radioactive waste. Its small users study on controlled burial, historic sources and funding matters highlighted the plight of small Institutions dealing with the expense of source disposal. The need in England to follow SEPA's initiative for an amnesty on the disposal of historic sources was once again raised. The possible demise of RWMAC and its replacement by a Committee of Radioactive Waste Management (CoRWM) was equally well aired and although still in its infancy will have a great deal to do overseeing the options for the management of solid waste. On this basis, Wynne felt that there was still a role for RWMAC although perhaps in a different form.

In all a good morning's session and although dealing with significant level of non-ionising radiation issues contributed a well needed input into AURPO's increasingly diverse membership.

Session 3: 3rd September (pm)

The conference programme for the afternoon comprised a varied quartet of papers united by the conference theme and their relevance and interest to AURPO members. No matter whether your appetite was for science, regulatory considerations or hands-on practicality, you would not leave hungry.

Transfer of Radionuclides to Neonates and Foetal Dose
Alan Phipps, NRPB

Alan set the pace with a presentation of the work of ICRP and NRPB on the transfer or radionuclides to the foetus and breast-feeding infant following maternal intake. The detailed modelling covered acute and chronic intakes at various times pre and post conception (thankfully not during) and derived transfer coefficients for a variety of nuclides at various stages of development. Data on foetal doses has been published in ICRP88 (Revised). Uptake from breastmilk is ongoing work.

Process Management in the EA
Chris Englefield, Environment Agency

Chris charted the birth and early days of Process Management at the EA. Their remit is to provide advice and support to area teams and to liaise with stakeholders such as AURPO. They strive to achieve consistency amongst our beloved field inspectors, and their development of training and CPD programmes will hopefully ensure that the standards we see in future will be high as well as consistent. Guidance notes on BPM and mobile PET scanners were cited as examples of output to date – in the future we can look forward to being consulted on required competencies of RSA93's qualified expert. One hopes we can improve on the suggested title of Radioactive Waste Adviser.

Management of Records
John Faulkner, Glasgow University

John placed on record the legion of records the regulations require us to keep. IRR 99 is a major culprit with RPA records, RPS records, staff training, classified workers, approved dosimetry services, area monitoring, designated areas, instrument testing, leak testing etc. RSA93 is not to be outdone with records of sources, sites, limits, and waste accumulation and disposal details. There was guidance on how long to keep them all for - along with salutary warnings of demands for records older than this. Buy a warehouse for them and keep a record of where your records are.

Appropriate Dosimetry
Arwel Barrett, HSE

Arwel rounded off the session with a view on appropriate personal dosimetry. The myriad of explicit and implicit references to dosimetry in IRR99 was covered, though little distinction was made between estimation and assessment. Choice of dosemeter to match the exposure scenario covered some interesting concerns around when to issue a dosemeter and for how long. Whilst we might all agree with the advice that personal dosimetry is not a substitute for area monitoring, opinion seemed to be divided on the converse assertion – that area monitoring is no substitute for personal dosimetry.

Just when you thought it was safe……. John popped up with a few more records he hadn't mentioned earlier. So many…..So many. It could be a record John!!

Progress report on AURPO Certificate in Radiation Protection

by Kevin Connor, Course Co-ordinator

The AURPO Certificate in Radiation Protection has been developed by the Scottish Centre for Occupational Safety and Health (SCOSH) and the AURPO in collaboration with the HSE and RPA2000. The course is aimed at assisting Radiation Protection professionals to demonstrate core competence (basic RPA capability) in accordance with Annex 3 of the HSE's statement on RPAs. This course does not teach people to become RPAs, rather it is concerned with assessing and demonstrating core competencies. As we approach the beginning of the third course this seems an opportune time to provide feedback on our lessons learned over the first two courses. Details of the new course beginning September 2004 can be found at http://www.cll.strath.ac.uk/cpd2radiation.htm

This e-leaning course has been designed to allow students to study by distance learning through the use of text based course content, supported by on-line tutorials and assessment with practical assignment within the workplace. The certification structure is as follows.

Part 1: Academic Knowledge

On successful completion of the 8 assessed course Units, a Certificate of Professional Development will be awarded by the University of Strathclyde, recognising academic achievement in accordance with the HSE basic syllabus.

Part 2: Practical Performance

On submission of a satisfactory Portfolio of Practical Achievement to address RPA 2000 criteria Strathclyde University will award successful candidates with a Certificate of professional Development in recognition of Practical performance.

Each student on the course is matched up with a Tutor who is an Accredited RPA and member of AURPO. Many of the tutors are also RPA 2000 Assessors. The Tutor and student build up a working relationship over the six months duration of the course as the student works through the course materials and build their Portfolio. As such the Tutor is well placed to assess the student's competence as an RPA. The idea being that the student an eventually present to RPA a portfolio of validated evidence which should make the task of the RPA 2000 assessor much easier.

This course is not a commercial venture. If we wanted it to be commercial we would have to charge considerably more than the current fee. From the £1,150 course fee the University of Strathclyde makes a modest amount barely covering their administrative fees and tutor expenses on course duties. The course Tutors (all AURPO) members are paid a nominal one off tutor payment, which in no way reflects the amount of time and effort they expend on the course. In truth we have some very committed and experienced Tutors who provide their services vocationally.

The first course had 40 students. 29 (72%) obtained their Part 1 certificate and 16 (40%) were awarded a Part 2 certificate. 11 students did not submit any work. The bare statistics do not tell the full story.

1. Many students indicated at the very start of the course that they were only doing the course to strengthen their academic knowledge in Radiation Protection and they would not be submitting a Portfolio for the Part 2 award. This included four

students from BNFL (who would be going down the BNFL route), four SEPA/HSE inspectors and a number of other students who did not feel they would be in a position to present a Portfolio in the course time-scales. Anecdotally we suspect around 40% of the students on the course only ever intended to do the part 1 of the course..

2. A number of the students withdrew (eleven) from the course for various reasons such as pressures at work or just finding the course too onerous. Two of the Students were mobilised to Iraq before the course was completed. As such the success rate for those to stayed the distance was very high. A number of the students ran out of time for submitting for the Part 2. Many of them are working on their Portfolios and will now submit direct to RPA 2000.

3. As mentioned above the Part 2 award was not the target for many of the students. However those that achieved it and subsequently submitted their Portfolio to RPA 2000 in general found their Portfolio speedily being processed though the RPA 2000 system in a couple of months.

4. We had one major problem, which is being addressed. During the course a student submitted an Assignment with a silly glaring error. His tutor spotted this and the Assignment was corrected. The student eventually was awarded a Part 2 Certificate. However for some reason the student submitted the old Assignment as evidence in his RPA 2000 Portfolio. Of course the alert RPA 2000 Assessor spotted the error. We have to put our hands up on this one. The whole basis of the course is that we have University standard validation processes in place.

The second course with 27 students is now complete. It is to early for proper statistics with only one student being awarded both the Part 1 & part 2 Certificates so far. The rest of the students work is being assessed and validated. In general we feel that this course has gone well. We have a good batch of Students who are very enthusiastic who in general have worked very hard. We hope for success rates similar or better to those achieved in the first course.

What is clear is that this course is an educational experience in radiation protection. Students need to apply themselves and work hard to get through the syllabus in the course duration. The course was never designed to take someone from a basic level in Radiation Protection to RPA level. Entry criteria for the course required that most candidates would be working as Radiation Protection professionals. As such we felt that many sections of the course would be revision and students would skip through very quickly. We wanted students to concentrate on applying their academic knowledge in situations where they would be giving advice as RPAs. However we have found that the mature students insisted in working very hard and in many cases quite pedantically through all of the academic Units and activities. For example we found that many students spent considerable time on the Basic Physics Unit doing all of the activities where many of them had Physics degrees.

Feed back from the students has been very positive. In general they commented that although they felt the course was considerably harder than expected they really enjoyed the experience and felt stronger and better RPAs. Our students came from a very broad spectrum within Radiation Protection. Less than half of them from AURPO. In particular we are surprised and pleased to have students from Amersham and BNFL.

A summary of where our students from the first 2 courses were employed is interesting.

Organisation	No of Students	Percentage	Remarks
University/Research	21	31	
Hospital/Medical Physics	11	16	
Other	35	52	Including 4 x SEPA/EA students, 7 x Amersham and 3 x BNFL

We already have strong interest in the next course. We are pleased that large companies like Amersham and British Energy are intending to send students again. Indeed much of the "new business" appears to be coming from personal recommendations from satisfied students. If anyone would wish any further information on the course please do not hesitate to contact either myself by email (kevin.connor@mentor.uk.com) or Colin Thorne, CPD Programmes Manager, Centre for Lifelong Learning, Graham Hills Building, 40 George Street, Glasgow G1 1QE Tel: 0141 548 2392, Fax: 0141 553 1270. E-mail: c.thorne@strath.ac.uk. A course application form is included with this article.

This course was originally conceived to help Radiation Protection professionals learn about radiation protection, practically assist them in preparing a RPA 2000 Portfolio and provide a vehicle where they could gain practical experience in new fields of Radiation Protection. The course was originally aimed at persons working in narrow fields of radiation protection who were struggling.

The Future debate:

As most of you know I enjoy debate and would wish to stimulate real discussion on this issue. My long held personal opinion is that I still believe the HSE's Statement on RPA's is wrong, too onerous, does not properly interpret the Euratom Directive. It entirely confuses the issue of RPA Suitability. I believe that our Professional bodies, not HSE should be setting the Professional Standards in Radiation Protection. Radiation Protection is only a specialist field in general health and safety and we should be looking to bodies such as IOSH for guidance and example. For example the IOSH approved NEBOSH system has three levels of qualification. The NEBOSH Certificate, NEBOSH Diploma part 1 & NEEBOSH Diploma part 2. To become a Registered Safety Practitioner you require a NEBOSH part 2. For some organisations they only require Safety Officers trained to the lower level.

We now have the situation in Radiation Protection where we have only the one RPA benchmark for all RPAs with no proper academic routes to learn radiation protection and the "Catch 22" position where it is now very difficult to become a new RPA. One of our long-term aims is to further develop the concept of this course to provide progressive, benchmarked and validated training at lower levels for RPSs and professionals in more specialist fields in RP such as Medical physics, Machine sources, X Rays and unsealed sources.

I believe a qualified expert approach to specialist fields is much more appropriate where someone with sufficient knowledge, expertise and experience in a narrow field is entirely suitable to be employed as an RPA in such a narrow field. The fact is that not all RPAs are full-time and dealing with the full spectrum of RP hazards. This one size fits all approach cannot work and is contrary to the focus of modern legislative change. I believe RP is insular, over legislated and needs to be brought back into the real world of General Health and Safety. The Ionising Radiations Regulations were intended to bring RP back to a more proscriptive approach while encouraging a risk based rather than a hazard based approach to radiation safety. While we do require recognised standards in RP training I believe that HSE should only demand a minimum standard, not competence based. Our Professional Bodies should set the competence standards allowing employers to choose RPAs on suitability and competence. In many ways the fault lies with these bodies for not tackling and resolving this issue sooner.

Kevin Connor
Health & Safety Consultant
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MEMBERSHIP NEWS

New Members

The Association welcomes the following members who have joined since September 2003:-

Pravin Patel	Christie Hospital NHS Trust, Manchester
Robert Hill	RPA Consultants Ltd, Milton Keynes
Paul Chazot,	University of Sunderland
Paul Gooda	British Aerospace, Dhahran, Saudi Arabia
Djilda Segerman	Royal Sussex County Hospital, Brighton
Mark Long	Unilever Research & Development, East Bebington
Gillian Rodaks	NRPB, Glasgow
Simon Willis	Newcastle University
Rosemary Bell	Southampton University
Martin Rollo (Associate)	Newcastle University

D Hague
Honorary Secretary

Report from the SULG meeting held Thursday 11th December

SULG - Bobb Russ (RSR Policy Manager and also has international functions being part of UK delegation to OSPAR and deals with UK trans-frontier shipment issues) is now chairman replacing Joe McHugh. Neville Higham has replaced Wendy Bines from HSE. Unfortunately Chris Englefield from Process Control was unwell and absent from the meeting and no written report was submitted from him.

The Guide to RSA93 has fallen into a bottomless pit in DEFRA and is unlikely to resurface - the general opinion was that it was not much use anyway. Chris Englefield and Bob Russ are going to visit this area leave out the DEFRA policy stuff and produce a document that just contains practical guidance probably combined with some Field Officers guidance material to create a Code of Practice (hopefully approved). The meeting supported this and were unanimous in wanting Field Officers guidance material to continue to be made widely available. Bob hoped that individual sectors would also produce guidance and I informed him that TCC were working on guidance and that Chris Englefield would be kept informed as to progress.

BPM - Latest information on this topic had not been circulated and with Chris Englefield not being present no update was available.

Disposal of sealed sources - EA is lobbying DEFRA hard to get an amnesty in England and Wales similar to the Scottish one. A bid for money is going to a security committee meeting with hopes fairly high. Bob Russ is particularly interested in hearing from people who have HASS sources that they would like to dispose of and have quotations for disposal but do not have the funds available. "Bob Russ" bob.russ@environment-agency.gov.uk. A query had been received on the return of old sealed sources to a manufacturer abroad and the application of the trans-frontier shipment regulations. The position is that if a sealed source is returned to the original supplier then it is exempt from TFS Regs. If not returned to original supplier then a TFS licence is required. NB: for multiple shipments a licence will last for three years and there is no cost (at present) for a TFS licence. It could be that your shipper may hold a licence that you could utilise rather than having to apply for one individually.

Welsh Rep - Welsh representation on SULG has never been formalised and with representative who could have represented Wales departing it was agreed that Welsh representation should be formalised. The Welsh area is planning to set up a group with regional RPAs and EA reps and a member from this group will then represent Welsh interests on SULG.

Environment - A document reviewing and outlining the EA position on modernising regulation has been published - entitled 'Delivering for the environment'. It is available on the EA website.

OSPAR - possible new developments in the application of OSPAR - extending it to non-nuclear sites should not affect us as EA intends to use PI reporting as the source of the data that they would present as relating to UK discharges under OSPAR. An EA research project estimated that the oil and gas industry was discharging nearly as much alpha emitters (NORM) into the North Sea as Sellafield! This has greatly upset the Norwegians, who contested the data, and cheered up BNFL.

Electronic Reporting - There was supposed to be a trial of electronic reporting for PI but nothing has materialised yet – Rob Allott to be chased up. No news on electronic application forms for RAS93 - Chris Englefield will be chased up on this. Electronic

forms are available on the EA website but they are not interactive. We were promised an interactive CD-Rom version of new forms before the end of this year but are still waiting.

Recording of Accumulated Waste - A paper was presented on this but it was too specific for a number of members. It is looked to develop this further with input to Cathy Griffiths from SULG members before presenting it to EA and IPEM. Linked to this EA were asked for an update on their policy re decay storage as nothing seems to have come out of their consultation exercise.

Qualified Expert - Again this was really an issue for Chris Englefield as he has been in discussions with RPA2000. I had pointed out that they could not just accept any RPA as the HSE had downgraded waste management to GA. Cathy Griffiths reported that RPA2000 were going to introduce a specialist certificate on waste management but this would not be started until 2005. Approval of QE's at the moment seemed to be rather adhoc as EA were still formulating their policy - even though by now everyone will have received new authorisation conditions specifying 'suitable RPAs or Qualified Experts approved by EA' . It is hoped that EA will be able to clarify this position by June 2004.

Aqueous discharges of uranium salts - I asked for clarification on this matter as I could not see how the Special Waste Regulations applied (neither could Bob Russ) as some people had indicated. Bob to investigate further and clarify the position re disposal of uranium salts to drain and to what extent could the EO continue to be used. There was also the issue of maximum permissible concentrations under any water authority discharge licence. NB for solid waste disposal there should be less than 0.1% by weight of uranium in the waste to be exempt.

Justification - Draft justification regulations for new practices should be issued by DEFRA on 20th January.

Trevor Moseley
University of Sheffield

RADIATION SAFETY WEB SITES

Authorisation of discharges of radioactive waste to the environment: Principles for the assessment of prospective public doses
http://www.environment-agency.gov.uk/commondata/105385/public dose principles issue 1

Ionising Radiations Health & Safety Forum
http://www.hse.gov.uk/aboutus/meetings/irhsf/

Radiation Protection News – Issue 24 November 2003
http://www.hse.gov.uk/radiation/ionising/rpa/rpa24.htm

Radiological Protection Bulletin
Issue 4 December 2003
http://www.nrpb.org/publications/bulletin/no4/index.htm

COMARE 8th Report: A review of pregnancy outcomes following preconceptional exposure to radiation
http://www.comare.org.uk/press_releases/documents/COMARE8thReporteBook.pdf

Review of EA Technical Report P3-073/TR

"Agency Practice and Future Policy in Decay Storage of Radioactive Wastes"
Available from WRC plc online at www.eareports.com (£15)

This report investigates current decay storage practice in non-nuclear sites, looking at the basic principles involved as part of a waste management system. Comparison is made with practice in other countries and recommendations are made for future practice. It is intended for internal EA use to inform the development of policy.

Historically, EA policy has been to limit decay periods in order to minimise doses to workers and the public. This has assumed the availability of rapid disposal options. As the cost of disposal is often linked to level of radioactivity in the waste, and environmental impact has become an increasingly important consideration, there has been pressure to extend authorised accumulation periods.

The project collated data on all current authorisations in England and Wales, based on information gained from the EA database and public registers. Analysis focused on those authorisations with waste accumulation periods of greater than 60 days – the intention being to distinguish between accumulation for decay storage purposes and for simple bulking of waste to make disposal easier or more economic.

The principle of decay storage is to effectively reduce or remove the radiological impact of earlier disposal. This can be achievable for short-lived radionuclides, but has reduced effectiveness as the half-life increases. Reduction in radiological hazard must be balanced against risk of exposure to other hazards (biological, chemical, sharps, flammables etc) which may be more significant. A decay store system also needs to comply with IRR99 and should therefore include:

- minimising exposure to workers;
- provision of restricted, ventilated areas for storage/handling;
- use of personal protective equipment as appropriate;
- personal and environmental monitoring;
- measures to prevent contamination and dispersion;
- documented working procedures;
- training; and
- records necessary to demonstrate compliance.

Waste should be segregated according to its physical, chemical, biological and radiological properties at the point of origin. Direct monitoring can then assist in determining the point at which waste can be discharged within authorised limits, or when it ceases to be under regulatory control.

IAEA recommends decay storage to optimise waste management for radionuclides with a half-life of less than 100 days. In the US, the Nuclear Regulatory Commission specifies half-lives of less than or equal to 120 days. In some countries it is common practice to segregate waste by radionuclide half-life into broadly short (<7days), medium (8-100 days) and long (>100days) categories.

The report summarises many recommendations published by the IAEA in their TECDOC series (653, 755 and 1041). For example, on the design of decay store facilities, standards of containers used and adequacy of records. Store design covers issues such as location, construction, size, finishes, ventilation and security. A proper record for each container in the store should include:

- unique id;
- radionuclide and measured or estimated activity on a specific date;
- potential and actual hazards;
- origin;
- surface dose rate and date of measurement;
- weight or volume;
- optimum decay storage period; and
- name of responsible person.

The section on waste treatment and conditioning lists available options for different types of waste, but most are not appropriate for small users.

There follows a review of radioactive waste management practice in various countries, including the United States, Australia and parts of Europe. Whilst there is some variation between nations, there is a trend to having a national waste repository and collection scheme for shorter lived radionuclides. Accumulation periods tend not to be time limited – some are reported to allow storage until the waste reaches a level at which restriction on disposal is not necessary. Of particular interest is the Belgian system where establishments are categorised according to the amount and radiotoxicity of the materials used. This is in direct parallel with the NRPB scheme for classification of radionuclide laboratories. The report suggests that the class of premises could be used by the EA to determine whether an organisation needs authorisation, and what level of storage facility (and regulatory scrutiny) is called for.

Current decay storage practice is reviewed, based on analysis of authorisations and RSA3 application forms, feedback from SULG members (sadly lacking input from any hospital representatives) and personal communications. Guidance on decay storage of ^{99m}Tc is reproduced from the EA Field Officers Handbook. Comparison is made with IAEA recommendations, which is somewhat problematic as our current practice is dictated by authorisations which are regulatory in nature whereas the IAEA guides are more practical. Nevertheless, some recommendations to the EA emerge, including:

- a requirement for more thorough risk assessments for storage;
- greater attention to standards of storage containers; and
- more details of waste stores to be requested on applications, with perhaps a requirement for alarms.

The section on potential impact of decay storage on dose draws heavily on the EA study of waste disposal in the East Anglian region by Burholt and Martin. Some worked examples show how doses to selected critical groups can be reduced by decay storage.

With a recognition that in storing wastes there may be greater risks from hazards other than radiation, the report has some recommendations to make:

1. Radionuclides with a half-life ≤ 90 days are appropriate for decay storage.
2. The premises classification scheme should act as a guide to the standard of storage facilities required.
3. Any waste form (solid, aqueous liquid, organic liquid) is suitable for decay storage given the appropriate containment, but the different forms should be segregated.
4. No firm recommendation on appropriate accumulation times. Reference is made to the use of 10 half-lives, with the caution that one needs to consider the amount of activity at the outset.
5. Attributes of a decay store should include adequate ventilation, sufficient capacity to cope with contingency arrangements and movement within the store, segregation on the basis of waste type and half-life, and uniquely identified sealed waste packages.
6. Segregation on the basis of half-life using 3 categories: <6 days, 6-71 days, and >71 days.
7. Segregation of liquid waste into organic, aqueous, non-homogenous sludge, infectious and chemically hazardous.
8. Solid waste segregation into categories: pathogenic, chemical toxicity, explosive/pyrophyric/flash point > 60^{o}C, presence of absorbed liquid, flammable, sharp objects, combustible, compactable.
9. A need for procedures to ensure that only appropriate waste enters the decay store and does not leave the store unintentionally. Procedures should include documentation needed to track the waste from production to disposal.
10. There needs to be discussion on whether decay storage should become mandatory as there is "unlikely to be a better practical environmental option".
11. Consistent and pragmatic approach from EA on requesting information from applicants. Information requested should also include:

    - identification of waste to accumulate for decay storage;
    - physical description of storage area;
    - packaging and container integrity;
    - documentation;
    - decay store management;
    - training details; and
    - financial assurance.

In summary, this is not a statement of "Agency Practice and Future Policy in Decay Storage of Radioactive Waste" – rather some recommendations for the EA to consider. Should the EA decide to incorporate these into policy, small users should be prepared for changes. The importance of this report has therefore yet to be determined.

Recent Regulatory Activity

The various regulatory bodies have clearly been busy in recent months. The following reports are taken from their respective websites and compiled so that we may all learn the necessary lessons.

The Royal Free Hampstead NHS Trust was fined on 16 April a total of £45,000 at City of London Magistrates Court for breaches of health and safety at work legislation and of the Radioactive Substances Act 1993. The Trust pleaded guilty to seven separate offences. On top of the fine, the Trust were also ordered to pay the full costs of £45,619.

Investigations by the Health and Safety Executive and the Environment Agency revealed a catalogue of failings in the management of a radioactive source, caesium 137. The investigation by HSE revealed serious deficiencies in the Trust's handling and storage of the caesium, as well as weaknesses in the training and supervision of staff and the procedures for tracking the source.

These failings resulted in the loss of the source, which has never been found, and in the risk of exposure to radiation of staff and members of the public. Adequate control over the source could have been achieved very easily by the Trust.

The caesium was used inside a patient's body to treat a tumour in March 2001. After use it was presumed returned to the locked store but in fact was not, as discovered in May 2001. The caesium could not be found despite searching at the hospital and waste disposal sites.

Environment Agency officer Adrian Bush said: "Those entrusted with radioactive material have a great responsibility to manage and dispose of such potentially harmful substances appropriately. This case highlighted the Trust's failure to protect its own staff, and this court action could have been avoided had management implemented a proper training and handling regime."

HSE inspector Emmie Galilee said: "This serves as a reminder to other employers who use radioactive materials that they should ensure that their control systems are in accordance with the Ionising Radiations 1999 Regulations - and give their staff, patients and members of the public the level of protection and reassurance they deserve."

On the 5 December 2003, at Gloucester Crown Court, **Cleansing Services Group Ltd** was fined £250,000 and ordered to pay £400,000 costs in respect of 15 charges of breaches of environmental and health and safety regulations in relation to its sites at Sandhurst, Gloucestershire and Exhall, Coventry.

The fine is the largest ever for a case taken by the Environment Agency relating to illegal waste activities.

At around 2:00am on the 30 October 2000, a fire broke out in the hazardous waste storage area at the Sandhurst site. Several fireballs and explosions followed and fire fighters from Gloucester and neighbouring towns and counties fought to control the

blaze. A number of Sandhurst residents were evacuated from nearby houses. Local residents reported they felt ill after the fire and investigations later revealed that a number of toxic substances would have been released including hydrogen chloride and phosgene.

The Agency and Health and Safety Executive established a dedicated team to investigate the cause of the fire. The complexity of the investigation was such that over 200 witness statements were taken, and numerous expert witnesses were used.

In summary, the findings of the investigation were:

- The most likely cause of the fire was due to the storage of bottles containing chemicals that could react together.
- The fire spread due to the failure to follow published guidelines on separation and segregation of flammable materials.
- The likely releases from the fire included hydrogen chloride and phosgene gas.
- Containers of waste were found stored incorrectly and had been kept on site longer than permitted by the licence. These wastes included selenium and solvents contaminated with BSE. Selenium is a highly toxic compound.
- Drums of low-level radioactive material were found on the site. CSG were not authorised to accumulate or dispose of such materials. These included small vials of thorium varnish and bottles from schools and laboratories.
- There was inadequate validation procedure for checking the wastes arriving at the site.
- CSG failed to comply with their working plan. Areas of failure included waste verification, qualifications for technical sales personnel, testing and maintenance of the wells where waste was treated, storage of waste and keeping records hazardous waste movement.

During the investigation into the fire the Agency received allegations by a former employee that hazardous waste had been buried beneath part of the Sandhurst site. A detailed on-site investigation, including magnetic imaging followed by boreholes, trial pits revealed waste including asbestos, storage tanks, tins of paint and resin, tar and oils had been buried under the waste transfer station, amounting to approximately 2400 tonnes of contaminated material. Documents found buried with the waste indicated the waste had been buried in the early 1990's

Mark Harris, Counsel for the Environment Agency and the Health and Safety Executive (HSE), told the Court that "the company's conduct fell well below the applicable standard and that the range and extent of offences admitted by the company demonstrated ingrained and fundamental management failings". He went on to say "A high degree of risk and extensive danger was created by the fire of 30th October 2000. The releases from the fire impacted on the health of local residents. The company illegally allowed hazardous waste to be buried under part of their site, near to the village of Sandhurst in Gloucestershire…and accepted radioactive waste when it was not authorised to do so and lost control of wastes including Selenium and BSE contaminated solvents."

Rhodri Price-Lewis, Counsel for CSG, told the Court "The company would like to take the opportunity to apologise to the public for the distress caused by the events and wished to express their sincere regret and remorse for what happened. The

company accepted the seriousness of the offences and had pleaded guilty on the first opportunity."

In sentencing, his Honour Judge Tabor QC, said "There were clear, serious failures of management in a number of key areas. The company failed to adequately protect their own workers and local residents."

Environment Agency Area Manager Harvey Bradshaw said "This brings to a conclusion a long and complex investigation where the Agency has worked very closely with the Health and Safety Executive. The seriousness of the offences are borne out by the fact that this is the highest fine the Courts have ever issued for a case taken by the Environment Agency relating to illegal waste management. It sends a very clear message to the waste management industry that the Agency will not tolerate negligent and deliberate acts resulting in the mismanagement of waste and the consequent unacceptable risk to people and the environment."

The charges CSG pleaded guilty to and fines imposed are as follows:

- One charge each of breaches of Sections 2 (1) and 3 (1) of the Health and Safety at Work etc. Act 1974 and one charge of contravening Regulation 8 (1) of the Ionising Radiation Regulations 1999. **Fine £30,000**.
- Three charges of breaches of Section 33 of the Environmental Protection Act 1990, which include keeping controlled waste in a manner likely to cause harm to human health and pollution of the environment, and failing to comply with waste management licence conditions and failing to comply with the requirements of the site's working plan. **Fine £60,000.**
- Two charges of breaches of the duty of care requirements within Section 34 of the Environmental Protection Act 1990 for failing to prevent the escape of waste from their control, namely special wastes containing Selenium and solvents contaminated with BSE. **Fine £40,000**.
- One charge of breach of the Special Waste Regulations 1996, by failing to maintain a complete register of special waste consignment notes. **Fine £10,000**.
- One charge of breach of Section 3(1) of the Control of Pollution Act 1974 in that CSG knowingly permitted the illegal deposit of controlled waste where compound three now stands. **Fine £50,000**.
- Three charges of breaches of the Radioactive Substances Act 1993 relating to keeping and accumulating radioactive closed sources, laboratory smalls and varnish without being registered or not in accordance with an authorisation to do so. **Fine £30,000**.
- There are also two charges relating to breaches of Section 33 of the Environmental Protection Act 1990 in relation to waste management licence conditions at their site at Exhall, Coventry. **Fine £30,000.**

The UK's second largest defence contractor, **Thales Defence Ltd**, has been issued with an Enforcement Notice by the Environment Agency, under the Radioactive Substance Act 1993. This comes as a result of failure to comply with their registration limits for the possession and storage of radioactive materials.

Thales Airbourne Systems Division of Manor Royal, Crawley belongs to the Thales Defence Ltd group. Thales Airborne Systems produces a range of radar systems, such as those used by defence forces in the UK and across Europe. Radar systems require the use of electronic components, some of which contain the radioactive element tritium, which is stored on site.

Tritium is used in a limited number of products in addition to electronic components such as emergency exit signs and glow-in-the dark fishing floats, and emits a very weak source of radiation. Although this poses a minor risk to both the environment and human health, the Environment Agency monitors the activities of all companies using tritium.

At present Thales Defence Ltd is authorised to store tritium in limited amounts under their registration. However, on 29 January 2004 Thales Defence Ltd informed an Environment Agency inspector that the company had broken its registration limits. Upon further investigation by the Environment Agency it became apparent that it was an absence of adequate record keeping and management systems that led Thales Defence Ltd to breach their registration limits over several months.

Although these shortcomings did not pose a direct threat to the environment and the local community, the Enforcement Notice requires Thales Defence Ltd to improve its management and control of radioactive substances to ensure that they comply with their registration.

Environment Agency inspector Vincent Malachanne said: "At present the company's arrangements do not meet its legal obligations. This notice will trigger an in-depth internal review of all company procedures and practices involving radioactive materials. By enforcing licensed limits and conditions, the Environment Agency promotes good management practices that will ultimately safeguard local communities and the environment."

Failure to comply with this Enforcement Notice may result in Thales Defence Ltd being prosecuted by the Environment Agency.

The Environment Agency has served an Enforcement Notice under the Radioactive Substances Act 1993 on a company at Winfrith Technology Centre in Dorset. This followed a routine inspection of radioactive sources used by **RWE NUKEM Ltd**. The Notice took effect from 11 November 2003.

The action was taken because the company was using a type of radioactive source for which it was not registered under the Radioactive Substances Act. Radioactive sources are used to calibrate radiation-monitoring instruments for the company and external customers. RWE NUKEM Ltd is registered by the Environment Agency to keep and use certain other types of radioactive sources in its calibration facility.

The Enforcement Notice requires RWE NUKEM Ltd to set up a regular auditing procedure to check the types of sources it holds. It must also review the training programme for relevant staff to ensure they have a working knowledge of the current permits covering the radioactive sources the Company is allowed to use.

Andrew Stone, Nuclear Inspector for the Environment Agency said: "Although there was no impact on the environment on this occasion, the Agency views any failure to register radioactive material as a serious matter. It is extremely important that operators are aware of the conditions and limitations of permissions that are issued to them".

A public consultation is being held by the Environment Agency to consider an application from the **Imperial College of Science, Technology and Medicine**. The application is to reduce the limits in the authorisations the Imperial College currently holds to dispose of radioactive waste from its Reactor Centre at its Silwood Park campus in Ascot, Berkshire. The consultation will run from 31st March until 31st May 2004.

Imperial College owns and operates a low power nuclear reactor at its Silwood Park campus for educational and business purposes. Over recent years the Imperial College has reduced the amount of waste from the site. Following a routine review by the Environment Agency of the existing authorisations to dispose of radioactive waste, Imperial College was asked to apply for a variation of its authorisations to reduce the limits to more closely reflect their reduced levels of radioactive waste.

The reactor was commissioned in 1965 and has been used for teaching, training and research in science and engineering. It also provides services to various industries, such as the medical and pharmaceutical industry to help research and development into new drugs and treatments. The reactor is not used for the production of electricity. It produces only 100 kW of thermal power when in operation, which is some tens of thousands times less than a typical power-generating nuclear reactor, and equivalent to the energy produced by one hundred household electric fires.

The Reactor Centre generates very small amounts of solid, liquid and gaseous radioactive waste. The environmental impact of this is very low, typically less than 0.1% of that generated by natural background radiation in any year, such as that from rocks and soil.

The Environment Agency has prepared a draft authorisation for the Imperial College Reactor Centre for consultation. The varied authorisation brings together regulatory controls into one document, covering solid, liquid and gaseous waste, providing a more transparent and improved method of regulation.

People can view the document at:

- local authority offices in the Royal Borough of Windsor and Maidenhead;
- local libraries in the Royal Borough of Windsor and Maidenhead, Bracknell Forest, Surrey Heath and Runnymede;
- at the Environment Agency offices in Frimley

Comments should be sent in writing to the Environment Agency, Imperial College Reactor Centre Consultation, NRG (South), Stables 4, Howbery Park, Wallingford, Oxon, OX10 8DB, or by email to *nrg.south@environment-agency.gov.uk*

The Environment Agency, on 15th Dec 2003, issued an Enforcement Notice on **British Energy Generation Ltd**, relating to radioactive discharges from Hartlepool Power Station.

The notice relates to the amount of a particular radionuclide (Sulphur-35) in discharges of coolant gas into the atmosphere from the station.

The levels concerned would not have had any significant impact on either the environment, or the public and were below the limits British Energy is authorised to release in compliance with the gaseous waste disposal authorisation at Hartlepool.

An Agency spokesman said today: "The Enforcement Notice was issued because we believe the company could have done more to limit the levels of Sulphur-35."

In January 2003, levels of Sulphur-35 were found to be above those normally expected in discharges. British Energy investigated the reasons for this and developed a strategy for minimising releases of this radionuclide.

The Agency spokesman added: "British Energy recently reported further elevated discharges to the atmosphere as a result of an apparent failure to fully implement this strategy.

"The Agency considers that this represents a failure to use the Best Practicable Means to limit the radioactive content of the gaseous waste, which is a condition of the authorisation. The aim of the enforcement notice is to restore compliance with the authorisation."

Message from the Honorary Treasurer

Dear Members,

The flyer for the Annual Conference has gone out and I hope to see as many of you at QUB in Belfast as possible. AURPO has tried to keep the cost down in order for members to attend without too much of a burden on their institutions. The Association will therefore subsidise the cost of the accommodation at Jury's Hotel Belfast and I am sure you'll have a very comfortable stay.

Please note that the AURPO subscription year is running from 1st July of the current year to 30th June the year after. By the time you receive this issue it is nearly July 2004. May I reminder you that the subscription for next year 2004-2005 is due on the 1st July 2004. If you are attending the conference in September 2004 you could pay your subscription with the conference fee otherwise please make the payment by filling in one of the forms enclosed with this issue and send it to me with your subscription payment.

Many of you have received a final reminder for the subscription for the last year (2003-2004) which will end on 30th June 2004. Please ensure you pay the subscription without delay.

Thank you

Sonia
AURPO Honorary Treasurer

AURPO Subscription 2004-2005

To all members:

The **annual subscription** of **£20** (£10 for retired members) to the Association is due on the **1st July 2004**. Members who attend the Annual Conference in September 2004 may pay the subscription fee at the time of registration. Otherwise please return the tear-off slip below, together with your cheque made **payable to AURPO**, as soon as possible.

Sonia Nuttall
Honorary Treasurer

To: Mrs S Nuttall, Honorary Treasurer, AURPO
Faculty of Applied Sciences, Hawthorn Building
De Montfort University
The Gateway
Leicester LE1 9BH

I enclose a cheque made **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 2004-2005 (1st July 2004 to 30th June 2005**).

I confirm my membership of IRPA through the Association

Name: ……

Address: ……

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Telephone: ……..

Fax: ……..

Email: ……..

Signed: …… **Date:** …….

GUIDANCE TO REPPIR

Risk Assessments

Management of Health and Safety at Work Regs - Reg 3 (*Ref A8)*
IRR 99 - Reg 7
See ACOP paras 36 - 55 (*Ref A3*)

See Appendix 12

General

36. Before commencing a new work activity involving ionising radiations the employer has a responsibility to ensure that a risk assessment is made which identifies the hazards and evaluates the nature and magnitude of the risks to which both workers and members of the general public could be subjected. In situations where large quantities of radioactive material are used the employer will also need to check to see if the requirements for prior risk assessments under the Radiation (Emergency Preparedness and Public Information) Regulations 2001(REPPIR) apply.

Appendix 12 – Other Regulations – REPPIR

The Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR) may apply if you hold on the premises or transport (by rail or transfer through a public place) large quantities of radioactive material that in an emergency could be dispersed. Road transport is not covered by these regulations.

If the full regulations apply then a number of onerous duties will be incurred such as:

i. Prior risk assessment agreed with the HSE
ii. Emergency plans in case the emergency occurs, which will need to involve the local authorities who can charge the operator for their costs
iii. Tests of the emergency plan, again the costs can be charged to the operator.

If the full regulations apply then reference to the regulations and the guidance to the regulations will be required.

Application of the regulations

The regulations apply if it is estimated that due to an emergency a member of the public could receive an effective dose of 5mSv, 15 mSv to the lens of the eye or 50 mSv to the skin. REPPIR applies to premises, rail transport or conveying through any public place other than by the standard transport modes (such as rail, road, inland waterway, sea, air or by means of a pipeline).

Premises

The quantities of each radionuclide held on the premises, which if dispersed could be expected to produce a radiation emergency, are specified in schedule 2 of the regulations (and schedule 3 if fissile material is held). If more than one radionuclide is held the sum of the ratios of each radionuclide activity to its quantity in schedule 2 has to be greater than one for the regulations to apply.
Therefore the regulations do not apply if the quantity of radioactive material is below the levels in the schedules, or to any material that would not be dispersed in a foreseeable emergency. For an establishment with just a range of open source radionuclides it is unlikely that sufficient activity would ever be on the premises for the full regulations to apply. For example the quantity limit of P-32, which can be held on the premises, is 100 GBq.

Large sealed sources such as irradiators may push the total over the activity limits, but the build standard of most sealed sources is such that these sources would not be considered dispersible and so do not need to be considered in the total dispersible activity. Non dispersible sources are those certificated as special form, those in type B packages and any material where the operators assessment concludes they are non dispersible. A written assessment should be kept confirming why the larger sources are considered non dispersible. Use should be made of the Health and Safety Laboratory Research Report FS/99/19 *Release fractions for radioactive sources in a fire* *http://www.hse.gov.uk/research/hsl_pdf/2002/fractrad.pdf*

In practice the regulations should not apply to Universities.

Transport

The limits for transport by rail or transfer through a public place are in schedule 4 (and schedule 3 if fissile material is transported) and are the same as the limits for a Type A package of non-special form radioactive material. It is therefore unlikely that the regulations will apply unless radioactive material, greater than in schedule 4, is transported by a method not covered by other regulations and is not in a type B container. For example they would apply if a large old sealed source, which no longer has a valid special form certificate, needs to be transported across campus and a suitable Type B container is not available. It would be advisable however to employ a specialist contractor to make such a move.

Example - REPPIR

A range of open source radionuclides are held on the University premises, the maximum quantities are limited by the University registration under the Radioactive Substances Act 1993.

Isotope Group	Limit (GBq)	Sch 2 (GBq)	Ratio Limit/Sch 2
H-3	20	70000 (water)	0.0003
C-14 P-32 P-33 S-35 Cr-51	13	100 (P-32)	0.13
I-125	2	100	0.02
Other	2	100 (Na-22)	0.02

Sum of ratios = 0.17

Even taking the lowest (worst case) schedule 2 level in the isotope groups the sum of these ratios is below one (the actual holding are significantly less than these levels). Therefore if these dispersible radionuclides were the only ones on the premises then REPPIR would not apply.

A similar sum of the closed sources held on the main site gives a figure of 183 principally from just a few sources.

Source	Activity (GBq)	Sch 2 (GBq)	Ratio Activity/Sch 2
Co-60	8700	60	145
Am-241	10.6	0.3	35
Am-241	0.36	0.3	1.2
Am-241	0.36	0.3	1.2
Am-241	0.072	0.3	0.24
Cm-244	0.058	0.4	0.15
Am-241	0.044	0.3	0.15
All others	various	various	0.25

The hazard is from principally 7 sources, 4 of which would exceed the REPPIR levels on their own. Assessments were then done on each of the seven sources, which covered

- Dispersibility of the source
- Reasonably foreseeable events
    - Fire
    - Malicious activity
- Effect if source containment was breached
- Emergency procedures (in consultation with the Fire and Rescue Service and the Police)
- Summary

All seven sources were assessed as non-dispersible therefore the full REPPIR regulations did not apply.

No transport of radioactive material occurs above the levels in schedule 4, and the University holds no fissile material.

Cancer risks from diagnostic X-rays

Diagnostic X-rays are the largest man-made source of ionising radiation exposure to the general population and contribute about 12% of the total annual dose from all sources.

An interesting paper in the Lancet last January uses data on the frequency of diagnostic X-ray use, estimated doses to individual body organs, and risk estimates for these doses to deduce the cumulative risk of cancer up to the age of 75 years that could be attributable to diagnostic X-ray exposure.

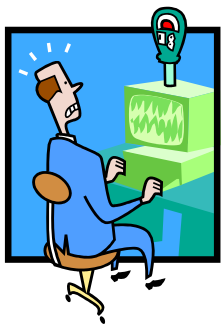
The authors' results indicate that in the UK about 0.6% of the total cumulative risk could be attributable to diagnostic X-rays. This percentage is equivalent to about 700 cases of cancer per year.

Of course, these average risks are meaningless for any one individual, where the nature and frequency of the radiological examination may be very different from the average. For example, cases of radiation-induced cancer per million examinations vary from a low of 1 per million for a chest X-ray to a figure of 280 per million for

coronary angiography. The authors also compared risks in the UK with data from 14 other developed countries, where the frequency of use of X-radiation as a diagnostic tool varies widely. The figure of 0.6% for the UK can be compared with 1.5% for Germany and as much as 3.2% for Japan.

Reference: Amy Berrington de Gonzalez and Sarah Darby: Risk of cancer from diagnostic X-rays – estimates for the UK and 14 other countries: The Lancet Vol363 (2004) pp345-351

And a note from the past …….



Younger readers may not realise quite what a slog was required in the early years of health physics to undertake what are now very straightforward calculations. In the 1950s, mechanical and electric (note: not electronic!) calculators were monopolised by the theoreticians, so lesser mortals were dependent on slide rules and, *in extremis*, on printed tables of logarithms and trigonometric functions.

But the staff at AERE Harwell were more fortunate. They had at their disposal special-purpose calculating aids based on the slide rule principle. One of these devices was an "Isotope Handling Calculator" with which radiation dose rates from seven commonly used radionuclides, or "isotopes", could quickly be displayed as a function of activity and distance. The same device could then be used to determine the reduction in dose rate as a function of thickness of lead shielding storage pots.

The calculator consisted of two engraved, concentric independently rotatable discs of plastic and a rotating cursor line engraved with the correct reading positions for any of seven gamma emitters. Apart from benefits of speed and convenience, using this calculator avoided the serious drawback when using a conventional slide-rule of failing to keep mental track of the position of the decimal place, the consequence of which was an order of magnitude error.

The Mk.III version of the calculator, issued in 1963, was accompanied by a note that "*the scale for safe maximum handling time per day has been deleted now that recommended exposure limits are expressed both in terms of integrated totals over a working lifetime, and over a 13-week period. From this it follows that a single short-term limit cannot be adopted without having regard to the frequency of exposure and the status of the individual*".

Another calculator of similar construction was the "Isotope Calculator". This had four concentric discs and a rotating cursor and speeded the computation of the specific activity after any given time of an element irradiated in a neutron flux. The first version of this device was manufactured in 1949 and was, surprisingly, "unclassified".

Letter to the Editor

Trevor Moseley wrote an interesting and informative article in the last Newsletter (Volume 04.01) about the practical aspects of undertaking leak tests on sealed sources. I agree with Trevor's recommendations for action to take on the rare occasions when a source is found to be leaking, and especially with his judgement that a source that is found to be leaking a little is likely to be leaking a lot more at future tests.

However, the "official" criterion of ISO 9978, namely that the activity removed on a wipe should not exceed 200 Bq, is a crude measure of likely harm from the continued use of the source. To put this in a more realistic perspective, consider the implications of leakage from two commonly used nuclides manufactured as foil sources: Ni-63 and Am-241. I believe it is well established that both of these source types are liable to give above-background counts in leak test measurements. But the potential for harm from the released radioactive content is enormously different for these two nuclides. The Annual Limit on Intake, by inhalation, for Ni-63 is 38 MBq whereas for Am-241 it is 510 Bq.

Use of a single figure as the only pass/fail criterion in considering the significance of leak test results is clearly insufficient. For this reason, Trevor's final comments about the need to take other factors into account are important. In general, I would not be happy about an Am-241 foil that was "passed" despite releasing a large fraction of an ALI, whereas detection of several times the ISO 9978 pass limit of 200 Bq might be of low radiological significance in the case of Ni-63. The advice of an RPA is clearly necessary whenever there are doubts about the significance of wipe test measurements.

Robin Thomas

We are grateful to our 'anonymous' RPA for the following article.

It is better to look silly for five minutes, than remain ignorant for life……..

Although I have been an RPA for several years, and during that time have gathered reasonable experience in NDT radiography, I was recently called to advise on an event which I did not recognize as a Reportable Incident.

Difficulty was experienced in retracting an 148 GBq 192 Ir source back into the container. It was recovered from the end of the delivery tube using remote handlers and safely transferred to a recovery pot. The dosimetry recorded 250 microsieverts. The radiation employer was subsequently advised by HSE that this constituted a Reportable Incident under RIDDOR 1995, Schedule 1, para 8 (1b). (failure to return RAM to safe storage).

It may save other RPAs embarrassment to be reminded of this requirement, and to revise the wider consideration for both gamma (failure to return RAM to safe storage) and X (failure to terminate an exposure (auto-timer failure). Not only is there a need to consider notification under RIDDOR 1995, but also under IRR99 if significant doses have been recorded.

PD IEC TR 60825-14:2004

SAFETY OF LASER PRODUCTS – Part 14: A user's guide

This technical report provides guidance on best practice in the safe use of laser products that conform to IEC 60825-1. The terms "laser product" and "laser equipment" as used in this document also refer to any device, assembly or system, which is capable of emitting optical radiation produced by a process of stimulated emission. However, unlike IEC 60825-1, this document does not cover light-emitting diodes (LEDs).

This document emphasizes evaluation of the risk from higher power lasers, but the users of the lower power lasers may benefit from the information contained.

This technical report can be applied to the use of any product that incorporates a laser, whether or not it is sold or offered for sale. Therefore, it applies to specially constructed lasers (including experimental and prototype systems).

This technical report is intended to help laser users and their employers to understand the general principles of safety management, to identify the hazards that may be present, to assess the risks of arm that may arise, and to set up and maintain appropriate control measures.

The terms “reasonably foreseeable” and “reasonably foreseeably” are used in this document in relation to certain specific events, situations or conditions. It is the responsibility of the person using this document to determine what is “reasonably foreseeable” and what might occur “reasonably foreseeably”, and to be able to defend, on the basis of risk-assessment criteria, any such judgements that are made.

Reference is made in this document to laser “users”. This should be taken to include persons having responsibility for safety in addition to those who actually work with or operate laser equipment.

Standard Number: PD IEC TR 60825-14:2004
Title: Safety of laser products. A user's guide
Availability: Electronic Download (when in subscription) and Hardcopy
Subscription Modules: GBM22 (Electromechanical Components)
Status: Current
Publication Date: 30 April 2004
Pages: 96
Member Price: £63.00
Non-Member Price: £126.00
International Relationships: IEC/TR 60825-14:2004 Identical
Descriptors: Lasers, Safety measures, Light hazards, Hazards, Occupational safety, Training, Instructions for use, Risk assessment
ICS: 31.260
Committee: EPL/76
ISBN: 0 580 43659 4

EU Directive on the Exposure of Workers to Risks from Electromagnetic Fields

At last year's AURPO Meeting in Edinburgh, advance notice was given of an impending EU Directive on EM fields. This Directive has now been published and adopted by the EU as Directive 2004/40/EC of the European Parliament and of the Council, and so the HSE in the UK are taking steps to implement this Directive, which must happen within the next four years.

The published Directive is very similar to the original proposals and takes a relatively standard approach that will be achingly familiar to those of us dealing with IRR99.

As usual, the key to the Directive is risk assessment. The Directive says that employers should know the 'level, frequency spectrum, duration and type of exposure', so that an assessment of likely direct or indirect effects from those exposures can be made. In some systems this is quite straightforward but in sites with industrial RF equipment, for example, the levels and frequency spectrum might be extremely complex, and will need careful measurement (with expensive systems).

Another key part of the Directive includes the avoidance or reduction of exposures. This is again based on the so-called hierarchy of control measures (physical & administrative controls, the use of personal protective equipment, and the need for a system of 'dose constraints' based on exposure limit values).

The Directive also talks of the need for information, instruction & training for workers, and a system of health surveillance where appropriate.

Exposure to EM fields will be limited in two ways – an 'Action Value' (the point at which precautionary measures need to be taken) and 'Exposure Limits' – the levels of exposure that are not to be exceeded. The action values are taken directly from data published by ICNIRP (the International Commission of Non-Ionising Radiation Protection) in 1999. They are quire complex in nature, depending on the frequency of the EM radiation, whether the hazard arises from the magnetic or electric component of the field, levels of contact or induced current, or plane wave power densities. Exposure levels are also frequency dependent, but are based on either current density for the head/trunk, localised or whole-body SAR (Specific Absorption Rate of the EM energy), or power density for high frequency fields.

HSE are 'very keen to take forward the process of implementation jointly with industry' and to this end have already set up a Stakeholder Discussion Meeting in July, to enable those discussions to begin.

The full text of the Directive is available on the Internet, through the URL below:
(http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_184/l_18420040524en00010009.pdf)

Graham Hart
Bradford

BOOKS AND PUBLICATIONS

Michael Fuller

The Trials and Tribulations of the UniTech Services Group Inc. Laundry in Santa Fe, New Mexico

Supplement to Health Physics, Vol. 85, No. 2, August 2003

R Julian Preston

The LNT model is the best we can do – today

Journal of Radiological Protection, Vol. 23, No. 3, September 2003

A R Denman et al

Assessment of Health Risks to Skin and Lung of Elevated Radon Levels in Abandoned Mines

Health Physics, Vol. 85, No. 6, December 2003

Richard Wakeford – Editorial

Childhood leukaemia and radiation exposure of fathers – the end of the road, perhaps?

Journal of Radiological Protection, Vol. 23, No. 4, December 2003

Department of Health

COMARE statement on Green Audit occasional paper 2002/5, Cancer in Burnham on Sea North: Results of the PCAH (Parents Concerned About Hinkley) Questionnaire

Journal of Radiological Protection, Vol. 23, No. 4, December 2003

Watch For Radiation

Technology Monitor

Health Physics, Vol. 86, No. 1, January 2004

http://www.gammawatch.com (An interesting development, a radiation monitor in a watch for sale to the general public at $485)

L. E. Porter

An Unusual Incident: Breached 22Na Sealed Source

Supplement to Health Physics, Vol. 86, No. 2, February 2004

Joseph P. Ring

Radiation Risks and Dirty Bombs

Supplement to Health Physics, Vol. 86, No. 2, February 2004

Per Wikman

Trivial risks and the new radiation protection system

Journal of Radiological Protection, Vol. 24, No. 1, March 2004

S R Jones et al

Disaggreation of collective dose – a worked example based on future discharges from the Sellafield nuclear fuel reprocessing site, UK

Journal of Radiological Protection, Vol. 24, No. 1, March 2004

The following is a list of publications from the Environment Agency / DEFRA which may be of interest to members. A full listing of publications can be found on the WRC plc website or at www.eareports.com

Title	**Modelling the Dispersion of Radionuclides following Short Duration Releases to Rivers**
Reference No:	P3-074/TR
Author(s)	J.T.Smith; M.Bowes; F.H.Denison
Publication Date	January 2003
ISBN	1 84432 072 3
Price (Sterling)	£23.00
Abstract	The report presents the results of a study into developing a suitable model for the assessment of the dispersion of radionuclides after short duration releases to stretches of the River Thames. Concentrations and time integrated concentrations of radionuclides in the river environment downstream of the release point are presented.

Title	**Radioactive Waste Regulation**
Reference No:	R&D Publication 129
Author(s)	
Publication Date	March 2002
ISBN	1 85705 809 7
Price (Sterling)	£23
Abstract	The report provides information on a project to develop effective training around public participation for licence applications. The guidance should be used to understand developments in public participation in decision making, the public's requirements and concerns in participation processes and Agency experiences in running public participation exercises.

Title	**Investigation of the Sources and Fate of Radioactive Discharges to Public Sewers**
Reference No:	TR P288
Author(s)	J G Titley; A D Carey; G M Crockett; G J Ham; M P Harvey; S F Mobbs; C Tournette; J S S Penfold; B T Wilkins
Publication Date	July 2000
ISBN	1 85705 111 4
Price (Sterling)	£45
Abstract	The report presents the final findings of an investigation into the results of authorised discharge of radionuclides from hospitals, universities, research institutes and manufacturing to sewage treatment plants in public waste water as the practice of disposal to sewers is under review.

Title	**Habitats Regulations for Stage 3 Assessments: Radioactive Substances Authorisations**
Reference No:	P3-101/SP1a
Author(s)	D Copplestone; M D Wood; S Bielby; S R Jones; J Vives And N A Beresford
Publication Date	October 2003
ISBN	1 84432 175 4
Price (Sterling)	£0.00
Abstract	An electronic version of this document is available from WRc. Contact 01793 865138. A printed version is this document is available from the Environment Agency. Contact tel: 07867 906009, fax: 0118 953 5265

Title	**Environmental Dosimetry: The Current Position and the Implications for Developing a Framework for Environmental Protection**
Reference No:	TR P350
Author(s)	D S Woodhead
Publication Date	December 2000
ISBN	1 85705 471 7
Price (Sterling)	£15
Abstract	The report explores the control of radiation dosimetry to the environment from radiation waste management activities. The requirements of environmental radiation protection is introduced in section 1 of the report and factors that influence exposure levels of reference organisms in the environment of Europe are examined in section 2. In section 3 details of applied dosimetry models are given with an assessment of their use within an environmental protection framework. A summary and conclusions are in section 4.

Title	**Modelling the Combined Impact of Radionuclide Discharges Reaching Rivers**
Reference No:	P3-068/TR
Author(s)	J Hilton; S Small; D Hornby; P Scarlett; M Harvey; J Simmonds; A Jones
Publication Date	January 2003
ISBN	1 84432 031 6
Price (Sterling)	£23.00
Abstract	The available tools for assessing the impact of multiple radiological discharges to rivers were reviewed to trial them on the upper Thames river. The only simple models found were those of single source discharges and there were no tools to assess the impact of multiple discharges to one river system. Two existing tools were selected (a generic model developed previously and a more detailed model based on the PC CREAM assessment system) and a refined tool was developed. The study concluded that a generic model could be used in an initial screening assessment of the importance of radiological doses from multiple sources. However, it must be capable of being tuned to incorporate relevant habit and other conditions on each river.

Title	**Agency practice and future policy in decay storage of radioactive wastes**
Reference No:	P3-073/TR
Author(s)	N G Mitchell
Publication Date	July 2002
ISBN	1 85705 520 9
Price (Sterling)	£15.00
Abstract	The report studies the option for waste management known as decay-in-storage where wastes contaminated with radionuclides with a half-life of 90 days or less are kept in decay storage facilities. Recommendations are made on radionuclides and amounts, waste forms, the time period for storage, decay store construction and associated operational procedures.

Title	**Radionuclides Handbook**
Reference No:	P3-101/SP1b
Author(s)	M Kelly; M Thorne
Publication Date	October 2003
ISBN	1 84432 176 2
Price (Sterling)	£0.00
Abstract	An electronic version of this document is available from WRC. Contact 01793 865138. A printed version is this document is available from the Environment Agency. Contact tel: 07867 906009, fax: 0118 953 5265

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Treading uncertainly through the minefield of radiation legislation?

Need sound advice to guide you to safety?

I have nearly 30 years experience as a clinical scientist in the NHS, and more than 10 years experience as an RPA in the wider Health & University sectors.

I am Member of AURPO, IPEM & SRP, and have a full certificate of competence from RPA2000, including ionising & non-ionising radiations and lasers.

Following early retirement I will be able to offer my extensive expertise for Consultancy work, including the provision of advice, audit, risk assessment and radiation safety training.

Flexible and competitive contracts can be negotiated to suit your individual needs, with on-site visits backed up by telephone, email, and snail mail support.

You would get my personal attention every time - no big organisation to navigate.