

Minutes of the Thirty Seventh IRMF Meeting

Wednesday 20th May 2009
National Physical Laboratory

Present

Chair: Clare Lee, National Physical Laboratory

Secretary: Lawrence Jones, National Physical Laboratory

Gavin	Barrett	Gravatom
John	Bennett	DSTL
Reg	Bosley	Nuvia
Derek	Brazer	AWE
Pete	Burgess	Nuvia
Jeremy	Caunt	John Caunt Scientific
Ray	Chegwin	NPL
Ludovic	Chevallereau	Serco
Bill	Croydon	BAE Systems
Tim	Daniels	HPA
Peter	Danyluk	DRMS, AWE
Jordan	Davies	Sellafield Ltd
Paul	Deacon-Smith	Medical Physics Directorate St Thomas's Hospital
Denise	Delahunty	Regional Rad. Physics & Protection Service
Alan	DuSautoy	NPL
Dave	Fisher	Babcock Marine
James	Forde-Johnston	Canberra UK Ltd
Andrew	French	DSTL
David	Gallacher	Medical Physics Directorate St Thomas's Hospital
Andy	Galpin	Nuvia
Colin	Goruin	Devonport Management
Norman	Heffernan	Velindre Hospital
Chris	Hill	Thermo Fisher Scientific
Steve	Hutchins	AWE
Michael	Iwatschenko	Thermo Electron GmbH
Joanne	Johnson	RRPPS
Martin	Kelly	NPL
Chris	Llewellyn	Tracerco
John	Locke	Serco Assurance
Jan	McClure	HPA
Duncan	McClure	HPA
Ray	McConnell	VT Nuclear Services Ltd
Kyle	Millar	Defence Equipment and Support
Lee	Moody	Tracerco
Bob	Newiss	Nuvia
Steve	Newton	VT Nuclear Services
James	Parkin	Lab Impex Systems Ltd
David	Payne	HPA
Max	Pottinger	ThermoFisher Scientific
Mike	Renouf	British Nuclear Group Sellafield Ltd
Tony	Richards	Consultant
Debra	Rook	British Nuclear Group Sellafield Ltd
Keith	Simmons	Defence Equipment and Support
John	Simpson	Consultant
Sinclair	Tait	DSRL
Jeff	Slade	AWE
Gregory	Smith	BAE Systems Ltd
Paul	Stock	DSTL

Rick	Tanner	HPA
Gary	Teague	Gemini Tecnology
David	Thomas	NPL
Simon	Threadingham	DSTL
Mike	Walker	James Fisher IMS Ltd
Eliot	Williams	Sellafield Ltd
Mike	Woods	IRMC

On behalf of NPL, Clare Lee welcomed delegates to the thirty-seventh meeting of the IRMF. The minutes of the thirty-sixth meeting posted on the IRMF website were agreed to be an accurate record of that meeting, however, some of the links to presentations had been reported to be broken; Lawrence agreed to rectify this. In matters arising, Clare apologised for the delay in issuing the final consultation draft of GPG14 and informed members that John Bennett (DSTL), had agreed to host a meeting of the Working Group at which they planned to finalise the document. Clare informed members that the GPG on EPDs had been drafted and was presently being edited by an NPL technical administrator; the Guide was expected to be published shortly. Clare proposed, and it was agreed, that discussion of GPG30 would take place after the ISO 7503 update agenda item.

37.1 Good Practice Guide for the Use of Neutron Area Survey Meters

Graeme Taylor (NPL) was unable to attend the meeting so Lawrence Jones (NPL) presented the slides on his behalf. The purpose of the proposed GPG was to increase end users' awareness of the limitations of neutron area survey meters, and to provide best practice guidance on their use. Lawrence asked if any of the members present would be interested in participating in the production of the Guide.

A discussion took place about the drivers behind the Guide, its scope and funding. The general consensus was that a Guide orientated towards calibration of these instruments rather than a user guide would be more beneficial to the industry, since many users of neutron monitors had such specialist requirements. Pete Burgess (Nuvia) volunteered to be on the working group for the Guide and suggested Graeme also contacts AWE, BAE Systems and John Leake (formerly of Harwell) for contributions. Ludovic Chevallereau (Serco) said he might be interested in joining the group and Paul Deacon-Smith (St Tomas's Hospital) stated he had an interest in neutron measurements around linac installations.

37.2 Thermo Statement

Max Pottinger (Thermo Fisher Scientific) delivered a statement to the IRMF delegates updating them on the restructuring of Thermo Fisher Scientific. Max said it had been a significant 8 weeks for the Beenham site. The manufacture and support for the installed contamination detectors would move to the U.S and the manufacture and support for the portable detectors would move to Erlangen, Germany. The production of EPD's would continue at Beenham. Max announced that there would be no further discontinuations of products though small volume products would probably have their lead-time increased. Duncan McClure (HPA) asked if spares for the detectors would still be available and if it would still be possible to buy products in the UK. Max confirmed that spares would remain available and that the procedure for purchasing in the UK would be the same for the time being, though this could change in the future. Max was asked if Thermo would continue to service the Dosemaster, but he replied that the radiological line, including the Dosemaster, was to be discontinued. Derek Brazer (AWE) asked if there would be continuing UK support and if the prices would fluctuate with the

exchange rate. Max replied that portable detectors would be sent to bench service for repair at Erlangen and that there would be a fixed GBP price list. Michael Iwatschenko then gave a presentation about the portable and air monitoring detector production arm of Thermo moving to Erlangen. Michael stated that the Erlangen staff had retained a lot of knowledge and so would be able to service discontinued products. Michael went on to describe the manufacturer's approach to the design of new instruments, keeping the ALARA principle in mind to optimise their radiation protection characteristics. He compared the superior radiological performance of the RadEye range with its predecessors such as the EPD N2 and 1000R.

A number of members offered feedback to Michael on the RadEye:

- smaller controls were not suitable for use with Personal Protective Equipment
- not ergonomic
- too clever, might be better to have an instrument that does one thing well rather than one that does a number of operations adequately
- battery compartment was not well designed

Mike Renouf (British Nuclear Group) stated that the discontinuation notice given on Thermo's products was too short for the customer; this sentiment was echoed by Keith Simmons who said the MoD worked on a four-year programme. Michael Iwatschenko took this information on board and agreed that some improvements could be made.

37.3 Evolving Training at HPA

Jan McClure gave an overview of the new training scheme being implemented at HPA. Structured training had become necessary for a significant number of new staff, for the purpose of succession planning and also to provide a clear career path to all members of the group. The training was based on a matrix produced by Russell Truman (DSTL) which covered the Ionising Radiation Instrumentation Specialist (IRIS) required competencies and included both lectures and lab work. The HPA had set aside Wednesday afternoons for training with some of the General Awareness level lectures being researched and delivered by the new staff. The total time required to complete the lectures and lab based work was expected to be approximately two years.

Michael Iwatschenko inquired as to how much time training was taking up and Jan replied that about one and a half days was needed to reach the level of General Awareness. In response to a question about whether this training scheme would be made available externally, Jan said that it was a decision for senior management at HPA. Denise Delahunty asked if this training course would be incorporated in the NPL training framework, but Clare Lee replied that NPL would not be able to offer as much training on this subject as other institutions.

37.4 Implementation of ICRP 103 recommendations

Rick Tanner (HPA) updated members on the recommendations of the ICRP Publication 103, which had been published since he last presented to the IRMF eighteen months earlier. Rick's presentation concentrated on the changes, and additions, to the quantities used in radiological protection. He confirmed that definitions of the operational quantities hadn't changed but it was expected that they would change in the future. Rick detailed changes to the tissue and radiation weighting factors and described the new voxel phantoms for replication of reference man.

The ambient dose equivalent, H^*10 , had been calculated by Pelliccioni using the FLUKA code (used for all dose equivalent calculations), however, Rick expressed concerns that Pelliccioni had not applied the air kerma coefficient to the calculations and also there were not enough data points in the lower energy range. Rick also mentioned that there was a new dose constraint of $150 \mu\text{Sv y}^{-1}$ for members of the public from new build power stations; the NHS were not in favour of this new constraint being applied to all new facilities. John Simpson (Consultant) asked what the driver had been for the new constraint and Rick answered that it had been considered achievable and would provide good public relations for new builds.

In the discussion that followed, Jan McClure asked when the new coefficients would be published, and Rick replied that they would be presented in May 2010 at the next DOCAL meeting. She then asked why some of the coefficients have uncertainty associated with them while others do not; David Thomas (NPL) replied that it would be due to uncertainty in the measurement of the spectrum in those cases. In response to a question from Duncan McClure, Rick said that new operational quantities would be agreed at the next ICRU meeting in June 2009. Pete Burgess asked if 10 cm was deep enough for calculation of the ambient dose equivalent, and Rick replied that he thought it was unless one would be considering a beam of particles.

37.5 RID / RPI or both?

Ludovic Chevallereau gave a presentation discussing the uses of Radionuclide Identification Devices (RID) and Radiation Protection Instruments (RPI) from a customer experience viewpoint, and the considerations that should be taken into account when purchasing these instruments. Ludo began by explaining that expensive RID were not legal dosimeters and therefore could not be used for example for designation of areas as was usual for RPI, despite having a dose rate indication. He felt however that it could be possible for a QP to approve the calibration of RID for use as RPI and thereby reduce the number and types of instrument required. Ludo went on to suggest that the performance of RID could be further improved with the use of energy filters or new firmware and that a national certification scheme for the use of RID as RPI could be introduced.

Ludo's presentation sparked a long discussion on the instrumentation. Duncan McClure agreed that the dose rate measurement performance of RID had been improving and single devices capable of performing both functions were beginning to appear. Michael Iwatschenko stated that it was possible to use one device to satisfy the requirements of a RID and a RPI using the count rate to locate a source, and then converting the energy using an algorithm to obtain the spectrum and hence identifying the source. Jan McClure added that good quality type test data for RID was necessary in order to identify when the switch occurred between use of the GM tube and the NaI detector. The view of members was, that in general, the wrong people were writing instrument specifications and that manufacturers were hurriedly developing instruments to satisfy unrealistic demands.

Ludo concluded that there was scope for manufacturers to improve RID but users should consider modification of existing instruments, where possible, as a cheaper option than buying a new one.

37.6 Acoustics and Ionising Radiation Formulation and Strategy

Alan DuSautoy (NPL) gave a presentation explaining the way rolling program formulation was implemented at NPL. Alan explained that NPL's funding came from the National Measurement Office, which was part of DIUS (Secretary's note: after a Government reorganisation, the NMO now sits within the Department for Business, Innovation and Skills). The aims of the programme were to have an improved impact on public life and the quality of life, and where radiation protection has an economic impact on the UK. Tony Richards remarked that this style of program formulation was an improvement over previous methods. Michael Iwatschenko asked how far into the future NPL could plan ahead, and whether NPL would be able to take on a ten-year project. Alan replied that whilst DIUS only want to sign three-year contracts, they were looking into planning strategy ten years ahead. Alan invited IRMF members to submit project proposals by the end of May 2009.

37.8 Improved setup of the Electra/Mini 44B for the detection of ^{55}Fe

Steve Newton (VT Nuclear Services) shared details of an investigation that had been prompted by the detection of ^{55}Fe by IPM8 exit monitors that had not been detected by the Mini 44B at the point of work. British Energy required the instrument to be able to detect ^{55}Fe , ^{54}Mn and ^{51}Cr ; the aim had been to improve the 44B's detection of ^{55}Fe . The study concluded that the full ^{55}Fe photo-peak was still captured when the upper counting threshold was reduced from 1.5V to 0.6V and that the minimum detectable amount of ^{55}Fe could successfully be lowered. Reducing the threshold to 0.6V had produced an adverse affect on the measurement of ^{54}Mn (due to the lower background) and they had not been able to test the response to ^{51}Cr . Field trails were to continue in order to quantify the improvement in performance and the effect on background rates.

Responding to a question from Max Pottinger, Steve stated that the background count rate had been 2 counts per second with the threshold at 1.5V and 0.36 counts per second at 0.6V. Duncan McClure asked if the crystal of the 44B monitor had been inspected, and stated that 25% of crystals were replaced prior to routine calibration due to degradation or absorption of water. Pete Burgess suggested that the recording the photo-peak could be a way of checking the crystal integrity. Jeff Slade (AWE) added that the age of the probe could also be a factor as the new style probe drew a lot of current and could activate the overload inappropriately; the instrument used had been an old style probe

37.9 GPG30 Errors in Appendix 3 – Guidance on estimating surface activity

Mike Woods explained problems identified when calculating P-factors for radionuclides with complex decay schemes using the method described in GPG 30. Mike suggested changes to the technique for use in both simple and complex cases when considering coincident emission arising from the same decay. Mike described how this new way of calculating P-factors could produce results differing from the published method by up to 30 – 40%. Mike summarised that GPG30 required extensive revision.

Clare Lee suggested that any changes to GPG30 wait until ISO7503 is published and Denise Delahunty requested that the formulation of P factors be put in ISO7503 as it would be useful for GPG30 and ISO7503 to be consistent. Pete Burgess said that this issue would not be a problem for the nuclear industry and

Michael Iwatschenko felt it was irrelevant for beta surface contamination monitoring. Mike Renouf requested that ISO7503 be kept as simple as possible as it had previously been useful in court.

37.10 Development in ISO WG 17 standards

Tony Richards gave a status update on the standards currently in preparation by Working Group 17 (WG17):

ISO18589 had been published.

ISO11929 (8 parts all revised into 1 standard) was at the last stage of voting.

ISO7503 was being simplified after the previous draft was retracted. It was expected to be accepted by ISO as a standard at the end of the year, and feedback would be sought from IRMF members. Details would be given at the IRMF meeting in November 2009; Tony suggested that would be the appropriate time to begin revision of GPG30.

ISO8769 voting was due to take place soon. The 5% uniformity for class 1 sources was to be retained. Jeff Slade stated that it was not possible for the manufacturers to measure 5% uniformity but Mike Woods believed the required technology existed, that national laboratories had performed such measurements and that other methods of measurement were allowed. Jeff replied that these imaging techniques did not work as the emission rates were too low and that many European countries objected to the inclusion of 5% uniformity for class 1 sources. Duncan McClure felt that the definition of uniformity of sources needed to be changed. John Simpson's opinion was that sources simply could not be trusted to be uniform and he did not accept that measurement of uniformity to 5% could not be achieved.

ISO11665 issue of copies to interested IRMF members had been delayed.

37.11 Any other business

Keith Simmons announced that after many years of negotiation, an electronic copy of *JSP425, Examination and Testing of Ionising Radiation Detection and Monitoring Equipment* and *Radiation Detection and Monitoring Equipment Calibration Protocols* would be made available on the IRMF website. The documents remained MoD copyright and had been supplied for information only.

Jan McClure gave the results of an eye-averaging exercise performed by two large, separate groups of members earlier in the meeting. The groups had been shown different recordings of the count rate observed from a surface contamination monitor and been asked to write down their own eye-averaged estimation of the mean count rate. The recordings were made up of the same five short clips but they had been arranged differently so that one group had seen a low starting count rate and the other group had seen a high starting count rate.

Group	Starting cps	Mean Reported cps
A	25	30
B	35	29

Jan concluded that the starting count rate had not influenced the eye averaging abilities of the IRMF members.

Jan McClure also updated members on the progress of the IRIS certification scheme. Jan had prepared a portfolio for assessment against the certification criteria but assessment of three more portfolios was required before the scheme could go live. Pete Burgess had volunteered to complete one of these portfolios

and Jan asked that anyone else interested in preparing one email:
clare.lee@npl.co.uk

The date of the next meeting was agreed to be the 18th November 2009.

Clare Lee thanked the speakers and delegates for attending, and also Stuart Humphreys and Lawrence Jones for their efforts in organising the meeting.