TENTH NEUTRON USERS’ CLUB

25 SEPTEMBER 2001

TECHNOLOGY TRANSFER ACTIVITIES OF THE NATIONAL MEASUREMENT SYSTEM PROGRAMME FOR IONISING RADIATION METROLOGY

Vic Lewis
OBJECTIVES

Organisation of user clubs and fora

Organisation of and participation in measurement comparisons

Provision of guidance and documentation

Other activities
<table>
<thead>
<tr>
<th>Club</th>
<th>Contact</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionising Radiations Metrology Forum</td>
<td>Clare Scott</td>
<td>Six-monthly</td>
</tr>
<tr>
<td>Neutron Users Club</td>
<td>Peter Kolkowski</td>
<td>November &amp; May</td>
</tr>
<tr>
<td>Radiotherapy Standards Users Club</td>
<td>Rebecca Nutbrown</td>
<td>September 2002, September 2004</td>
</tr>
<tr>
<td>Gamma-ray Spectrometry Users Forum</td>
<td>Mike Woods</td>
<td>Annually</td>
</tr>
<tr>
<td>Alpha Spectrometry Users Forum</td>
<td>Mike Woods</td>
<td>Annually</td>
</tr>
<tr>
<td>Liquid Scintillation Users Forum</td>
<td>John Makepeace</td>
<td>Two meetings</td>
</tr>
<tr>
<td>Air Monitoring Club</td>
<td>John Makepeace</td>
<td>Two meetings</td>
</tr>
<tr>
<td>Radionuclide Calibrators Forum</td>
<td>Mike Woods</td>
<td>Two meetings</td>
</tr>
</tbody>
</table>
IONISING RADIATIONS METROLOGY FORUM (IRMF)

Aims

• to facilitate the exchange of information about available UK calibration and testing facilities
• to facilitate efficient use of those facilities by those required to comply with the requirements of ionising radiations regulations and associated codes of practice
• to represent members’ interests in discussions with expert bodies, including those responsible for regulations and for forming standards.

Activities

• hold meetings to discuss matters of common interest relating to calibration and measurement
• maintain and disseminate register of UK calibration and testing facilities and services
• organise measurement comparisons in UK
• encourage good measurement practice, including traceability to national standards
IONISING RADIATIONS METROLOGY FORUM (IRMF)

Membership

Representatives of UK organisations involved in calibration or measurements in the field of ionising radiation and radionuclide metrology
Representatives of manufacturers of instruments for such measurements

Fees

No annual subscription

Meetings

Six-monthly meetings at NPL in early November and May
Small charge to cover cost of meeting
IONISING RADIATIONS METROLOGY FORUM

Catalogue of Facilities and Services Available in the UK for the Calibration and Testing of Radiation Protection Instruments

<table>
<thead>
<tr>
<th>Type</th>
<th>UKAS-Accredited</th>
<th>Non UKAS-Accredited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Standards Laboratories</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>UKAS-Accredited Facilities</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Non UKAS-Accredited Facilities</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>82</strong></td>
</tr>
</tbody>
</table>

www.npl.co.uk/npl/clubs/irmf
## Measurement comparisons in UK

<table>
<thead>
<tr>
<th>Description</th>
<th>Years</th>
<th>Notes</th>
</tr>
</thead>
</table>
IRMF NEUTRON MONITORING COMPARISONS

SECOND: 1998/1999

| AEA, Harwell | $^{241}$Am - Be | Harwell 0949 |
| DRaStaC    | $^{252}$Cf      |               |
| NPL         |                | Studsvik 2202D |
| NRPB        |                |               |
| BAE Systems |                |               |
## THIRD IRMF NEUTRON MONITORING COMPARISON

<table>
<thead>
<tr>
<th>Institution</th>
<th>Isotope</th>
<th>Energy</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEA, Harwell DRaStaC NPL NRPB BAE Systems</td>
<td>$^{241}\text{Am - Be}$</td>
<td>2.7 MeV</td>
<td>Mark 7 NRM NM2</td>
</tr>
<tr>
<td>BNFL, Berkeley NPL</td>
<td>$^{252}\text{Cf}$</td>
<td></td>
<td>Mark 7 NRM NM2</td>
</tr>
</tbody>
</table>
THIRD IRMF NEUTRON MONITORING COMPARISON

PROTOCOL FINALISED: AUGUST 2001
CHECKS at NPL: SEPTEMBER
PARTICIPANTS’ MEASUREMENTS BEGIN: OCTOBER
REPORT to IRMF MEETING: NOVEMBER
FINAL MEASUREMENTS for Am/Be, Cf-252 FIELDS: MARCH 2002
ANALYSIS of Am/Be, Cf-252 DATA: APRIL 2002
FINAL MEASUREMENTS for 2.7 MeV FIELDS: APRIL 2002
REPORT to IRMF MEETING plus WORKSHOP: MAY 2002
FINAL CHECKS at NPL: MAY 2002
ANALYSIS (2.7 MeV): MAY 2002
DRAFT REPORT: JUNE / JULY
FINAL REPORT: SEPTEMBER
NPL MEASUREMENT GOOD PRACTICE GUIDES

GPG 14  Portable Radiation Protection Instruments  
Clare Scott, Peter Burgess, Mike Woods  
Published: March 1999

GPG 29  Installed Radiation Protection Instruments  
Mike Woods, Max Pottinger, Lynsey Keightley  
In press: Sept 2001

GPG 30  Practical Radiation Monitoring  
Mike Woods, Alan Edwards, Lynsey Keightley  
Final consultation  
Publish: December 2001

GPG 34  Radiometric Non-Destructive Assay  
Paul McClelland, Vic Lewis  
Initial consultation  
Publish: December 2002

GPG ??  Uncertainties in Radiological Measurements  
Vic Lewis, Mike Woods, et al

GPG ??  Air Monitoring  
WG to be set up in 2002
Radiometric Non-Destructive Assay

This guide provides recommended procedures for the operation, testing and calibration of equipment used for radiometric non-destructive assay of fissile and radioactive materials in the nuclear industry.

The various techniques and their limitations are described. Guidance is given on calibration of NDA systems and the treatment of uncertainties in NDA measurements.

Recommendations are made for certification, performance demonstration and testing; competence and responsibility; documentation and control of modification.
Good Practice Guide 34: Radiometric Non-Destructive Assay

**Working Group**

- Patrick Chard
- Arthur Dale
- Ashley Finlayson
- Jonathan Hart
- Andrea Lewis
- Vic Lewis (Secretary)
- Paul McClelland (Chairman)
- David Simister
- Adrian Tolchard
- Antony Towner
- Kevin Whitehouse
- Colin Wilkins

- UKAEA, Dounreay
- BNFL Thorp
- BNFL Engineering
- AWE, Aldermaston
- NNC, Winfrith
- NPL
- UKAEA, Dounreay
- NII, HSE
- A N Technology Ltd
- A N Technology Ltd
- BNFL Instruments
- Harwell Instruments Ltd

**Sponsors**

- Atomic Weapons Establishment, Aldermaston
- BNFL
- Environment Agency
- Health and Safety Executive
- UKAEA, Dounreay
WORKSHOPS and NEUTRON USER CLUB MEETINGS

Neutron Users Club Meeting 4  
April 1991

Neutron Users Club Meeting 5  
April 1993

Workshop: Primary standards and field monitoring  
April 1994

Neutron Users Club Meeting 6  
October 1994

Neutron Users Club Meeting 7  
June 1996

Workshop: Neutron survey meters, personal dosemeters  
September 1997

Neutron Users Club Meeting 8  
February 1998

Neutron Users Club Meeting 9  
October 1999

Workshop: Neutron personal dosemeters, survey meters  
September 2000

Neutron Users Club Meeting 10  
September 2001

Neutron Users Club Meeting 11  
September 2002

Workshop: Radionuclide neutron sources  
September 2003

Neutron Users Club Meeting 12  
September 2004

Neutron Users Club Meeting 13  
September 2005