



**Annual report
2003/2004**

1. EXECUTIVE SUMMARY

The Measurement Advisory Committee (MAC) is an Advisory Non-Departmental Public Body (ANDPB) and advises the DTI on the effectiveness of its programme of expenditure in support of the National Measurement System (NMS) that has an annual expenditure for 2003/2004 of £46 million. The remit and membership are summarised in the annexes.¹

The sponsoring minister is Lord Sainsbury of Turville, Parliamentary Under Secretary of State for Science and Innovation.

1.1 IMPACT

During 2003 –2004 MAC has advised the National Measurement System Directorate (NMSD) on several issues in which the UK has or wishes to develop a leading position in measurement science, with implications for society and industry internationally.

In each case MAC has identified options and actively supported their implementation in order to deliver improvements whether in the delivery of science, cost savings, or enhanced services from the National Measurement Institutes (NMIs). Where MAC considers that more could, and should, be done by Government to provide infrastructure to support valuable UK businesses and services the committee reports its reasoning and has indicated potential solutions.

The committee recognises the limited budget of the NMSD and within this constraint has sought to increase the effectiveness of the NMS. In particular we have addressed three general issues:

- Measurement in new areas to support changing commercial and industrial needs
- Support for important topics that lack a strong NMS voice or need more proactive management
- Effective transfer of knowledge and skills into the wider community.

Examples of our activities are given below:

- Recommending the revitalisation of the internationally leading Watt Balance project, but with strengthened project management and wider collaboration and sponsorship.
- Recommending capital investment to allow medical radiation dosimetry calibration to continue.
- Recommending that the MSF “Greenwich Time Signal” should not be switched off in 2007.
- Providing advice on topics and experts to support Measurement for Emerging Technology
- Recommending renewed effort to maintain an effective knowledge transfer programme.

¹ Annex: What is MAC and its working groups?, Annex: Terms of Reference and Annex: Membership of the Measurement Advisory Committee

2. DISCUSSION

2.1 THE WATT BALANCE

MAC intervened in the Watt Balance project, flagged by the Quantum Working Group, as an ailing project. The project aims to provide a physics-based measure of mass, using atomic constants and electrical measurements to replace the archetype kilogram kept at Bureau International de Poids et Mesures (BIPM) in Sèvres. Development at the National Physical Laboratory (NPL) had been world leading but progress had stalled in recent years and a decision on whether to terminate the project or invest considerable resource was required.

MAC advised the DTI that the project was internationally important but that it should only continue if project management was strengthened, the route to exploitation was mapped out and collaborators were recruited. Such unequivocal and objective advice enabled DTI to direct NPL with confidence.

These conditions have been met although additional commercial and academic collaborators are still being sought. First project reviews held in early 2004 already indicate improved performance and better value for money. MAC continues to retain a keen interest in the programme with one MAC member participating on the technical and project review panel.

2.2 LINEAR ACCELERATOR FOR RADIATION DOSIMETRY

NPL dosimetry standards support more than 4 million radiotherapy exposures that are given to cancer patients each year. The traceable calibrations are made using a linear accelerator, commonly called a Linac, that has a normal life-span of about 20 years but the NPL research Linac is now more than 40 years old and is deteriorating rapidly. Its replacement is expected to cost about £3m with a further £1m needed for building refurbishment.

MAC recommended strongly to the DTI that this vital equipment be replaced without delay. The MAC also identified options whereby additional income might be generated. DTI has progressed the issue including discussions initiated with other Government departments, and funding is being identified.

2.3 MSF TIME SIGNAL

The UK time signal is currently transmitted from Rugby under contract until 2007 with BT, who have indicated a wish to redevelop the site for other uses. Advice was sought from MAC on whether the service should continue, how it might be funded and, if so, where the service should be relocated. The lead times for securing the provision of such broadcast facilities dictated that decisions needed to be taking during 2003 to secure the service beyond 2007.

The present service underpins a market of around £5 million (sales)² that generates nearly £900,000 in VAT receipts, which is nearly double the annual cost of the service.

² Source: "Recommendation on the future of the MSF 60 kHz standard frequency and time signal", J.R.Laverty, April 2003

Many safety critical organisations also use it and Network rail has indicated that there could be serious implications if the service were terminated.

At present the further development of the market is hindered as MSF is regularly off air and companies have little faith in the Government's long-term commitment to the service.

“Switching off MSF would entail a significant and as yet unquantified cost to convert existing systems. No studies have been done into replacements, but it can be said that losing the national time reference would have significant impact on the National Rail Network.”

Mr Lee Wiltshire, Radio Networks Engineer

The equivalent service in Germany (DCF77) is never off air but cannot reach all the UK population. Alternative GPS schemes are relatively expensive, require antennas with a clear view of the sky and, reportedly, are susceptible to interference.

MAC took the view that the MSF represents a valuable example of Knowledge Transfer from the NMIs. Further if it were to be switched off, leaving the UK reliant on the German service, many consumer products would become obsolete, which could result in negative publicity for NMS, DTI and the Government as a whole.

MAC offered the view that the MSF is a valuable service and a net revenue generator for the UK for which devolution to Germany is not appropriate.

MAC therefore strongly recommended that a clear commitment be given by Government to continue the service and such a commitment would be expected to result in a further revenue growth. To assist in Government in making such a commitment MAC suggested options for commercial sponsorship and alternative sites, including military bases.

2.4 NEW PROGRAMME MEASUREMENT FOR EMERGING TECHNOLOGIES

MAC welcomes the involvement of the National Measurement System in meeting future business needs identified by the DTI Key Business Technologies Directorate.

During the formulation of this programme MAC members have advised NMSD on topics likely to require new measurement technology and have identified businesses and technical experts who should be approached to take part in programme formulation and monitoring.

MAC is confident that this programme will be pivotal in updating national capability to meet 21st century measurement needs.

2.5 KNOWLEDGE TRANSFER

MAC and its Knowledge Transfer Working Group (WG) advised NMSD on the composition and implementation of the knowledge Transfer Programme. Phase 1 of the Programme included an awareness programme and pilots for the delivery of an advisory service, both sectorally and regionally. MAC expressed concern that NMSD had yet to approve the continuation programme, despite the success of Phase 1, and a suggested way forward.

3. ANNEX: WHAT IS MAC AND ITS WORKING GROUPS?

3.1 MEASUREMENT ADVISORY COMMITTEE

The Measurement Advisory Committee (MAC) is an Advisory Non-Departmental Public Body (ANDPB) and advises the DTI on the effectiveness of its programme of expenditure in support of the National Measurement System (NMS) that has an annual expenditure for 2003/2004 of £46 million.

The MAC, directly and through its expert advisory Working Groups, sets priorities for the NMS, advises on the formulation of NMS work programmes and the choice of suitable contractors and monitors in detail the progress, quality and relevance of the work.

Its independent chairman and 15 members, whose appointments are personal, unpaid and voluntary, perform the majority of work carried out by MAC. Their advisory work is complemented by 'ex-officio' representatives from other government departments and bodies concerned with measurement.

The Chairman and members are drawn from industry and academia and chosen, according to strict criteria set down for public appointments, because of their abilities to represent and understand the interests and needs of industrial and other users of measurement. To be eligible the individuals must hold, or have held, a key position in an organisation (whether it be industrial, academic or governmental) in which metrology is of significant importance. Moreover, they must be fully aware of the role of measurement in underpinning UK trade, quality, innovation and competitiveness. Most MAC members chair Working Groups, each of which is also made up of unpaid, volunteer experts. Each Working Group is responsible for one of the metrological programmes within the NMS portfolio.

3.2 WORKING GROUPS

The 18 MAC WGs, each reflecting a specific 3-year NMS-funded Programme, have a total membership of around 150 voluntary members. The WGs provide specific advice on the technical content of individual programmes, their management, and progress. This includes consideration of the economic and quality of life impact and regulatory benefits of the proposed work. In particular Working Groups are involved in the prioritisation of projects for inclusion in future programmes and in annual reviews of research in progress.

MAC and MAC Working Group administration is provided by DTI staff from the National Measurement System Directorate, which is part of the Innovation Group.

4. ANNEX: TERMS OF REFERENCE OF THE MAC

The objective of MAC is to offer the DTI strategic advice on the:

- Effectiveness with which the NMS supports innovation and competitiveness within UK business and industry;
- Priorities the Department should assign to programmes of work undertaken to meet the needs of the NMS;
- Broad objectives, balance and strategy for UK Government support of measurement.

These objectives are achieved by advising on:

- The needs of users in business, industry and the community; priorities for funding;
- The appropriate actions needed to ensure that good value is achieved from investment in NMS programmes and that the right balance is struck between measurement research and the needs of all users;
- The effectiveness of steps to secure greater engagement with business and industry and improve dissemination of the results of investment in NMS;
- Commercial opportunities resulting from the research and development carried out by contractors, in support of the NMS;
- Input to the Department's longer forward looks;
- Key priorities for the UK measurement system within a European and global context.

5. ANNEX: MEMBERSHIP OF THE MEASUREMENT ADVISORY COMMITTEE

5.1 MEMBERSHIP OF MAC AT 31 MARCH 2004

Chairman

Dr Colin Gaskell CBE
Royal Academy of Engineering

Independent Members

Dr Penny Allisy-Roberts OBE
Bureau International des Poids et Mesures

Dr Peter Bleasdale
BNFL

Mr Michael Buckley
South Yorkshire Trading Standards

Dr Peter Cowley
Rolls Royce plc

Prof Les Ebdon
*University of Plymouth, subsequently
University of Luton*

Dr David Ellix
The Industry Technology Facilitator

Mr Richard Freeman
The Precise Group

Prof Ken Grattan
City University

Mr David Holmwood
Universal Instrument Services Ltd

Dr Alan Johnson
Emerson Process Management

Dr Roger Jones
Druck Holdings plc

Mr John Latham
Coventry University

Mr Steve Lower
Sira Test and Certification Ltd

Dr Janet Townsend
PA Consulting Group

Dr John Tyrer
Loughborough University

Representatives from Other Government depts.

Dr John Dennis
Defra

Mr Cliff Double
Department of Health

Mr John Hunt
Ministry of Defence (RAF)

Dr John McGuinness
Health & Safety Executive

6. ACTIVITIES AND RESOURCES

6.1 BUDGET

The Measurement Advisory Committee has no dedicated budget although the National Measurement System Directorate administers the running costs in the form of travel and subsistence expenses paid in accordance with departmental guidelines. The total expenditure for the period 2003/2004 on MAC and its Working Groups, a total of more than 150 members, was £65,500.

6.2 RESOURCES

Active members typically invest around 10 days effort per year, with some contributing several man weeks, making a total of around 150 man-days of effort in advising and supporting the DTI (NMSD) during 2003/2004.

6.3 PROGRAMME OF ACTIVITIES

MAC and its working group members provide continuing advice and support during the year to guide the direction of research and services and also to monitor performance against targets.

6.3.1 MAC six monthly meetings

MAC meets twice yearly, for two days, to provide strategic advice to DTI (NMSD). These meetings were held at NPL in October 2003 and NEL in March 2004.

6.3.2 Formulation meetings

Formulation, the process of determining the strategic direction and allocation of resources for programmes, is a major activity for each working group, and is conducted on a three yearly cycle. In each case the WG meets for approximately 2 days to discuss the options proposed by the programme managers and makes recommendations on the scope, scale and priority of projects to DTI. During 2003/2004 the following programmes were formulated:

- Electromagnetic
- Time and Frequency
- Quantum
- Optical
- Thermal
- Photonics
- Software
- Materials
- Valid Analytical Measurement
- Biotechnology

With the recently increased emphasis on longer-term research WGs have invested considerable effort in helping DTI identify the most appropriate focus for new work.

6.3.3 Programme annual reviews

Most programmes WGs hold 2-day annual reviews to consider progress against plan and propose means of addressing concerns. Most include laboratory visits where world-leading work by many of the scientists is presented.

In addition there is considerable correspondence by telephone and email during the year to provide the on going support and guidance sought.

6.3.4 Other activities

Members of MAC and its Working Groups provide support at tender boards for competitively tendered NMS projects

Where programmes have encountered challenges MAC members have intervened, either providing advice and guidance on the quality and timeliness of all programme deliverables including reports, papers and other services or in a more “hands on capacity” assisting in the programme management and identifying partnership opportunities.