

Annual report

2004/2005

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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 2004/2005 of £60.4 million. The remit and membership are summarised in the annexes.

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

1.1 IMPACT

During 2004 –2005 the 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. 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 been active in important topics that lack a strong NMS voice or need more pro-active management to ensure that the NMS is able to deliver the most effective service to UK business, society and the scientific community

The MAC's remit is to act strategically, advising on priorities in the delivery of science, efficiencies or enhanced services from the National Measurement Institutes (NMIs). Accordingly, the MAC welcomed:

- The announcement in February 2005 of the NMS review, that it is understood will form the basis of a strategic plan for NMS and NMSD. The MAC expects to see an appropriate NMSD budget to enable the directorate to fulfil its obligations in managing the NMS programme.

The impact and value of the MAC's advice depends on the timeliness, succinctness and relevance of information from NMSD. However, NMSD's constrained resources particularly in the area of preparing briefings for MAC limit its capability to seek MAC's advice optimally. As a result the MAC believes its ability to offer strategic advice on specific issues has been somewhat constrained;

- MSF time signal – The MAC welcomes the approval for, and scope of, the procurement process for a broadcast contract, in line with its previous recommendations. The MAC notes however that, due to procurement delays the timetable is very tight. The MAC welcomes the intention to conduct the next review much earlier in the next procurement cycle so that the widest range of strategic options can be considered
- Knowledge Transfer - The MAC was disappointed to learn of the radical restructuring of the Knowledge Transfer budget without appropriate consultation, where the committee might have identified alternatives. The MAC recognises that NMSD believed it was under such time constraints as to make the seeking of advice impractical.
- Measurement Awards –The decision not to continue the National Measurement Awards was particularly disappointing, as was the limited range of alternatives considered. The MAC's view is that further consideration should be given to reinstating these awards, with a wider range of options considered; some members offered to consider ways in which this might be achieved.

Examples of the beneficial impact of the active engagement of MAC when NMSD resources can be directed to strategic activities include:

- Linear accelerator for radiation dosimetry – The MAC’s intervention contributed to a commitment from another department to fund some replacement equipment, essential to the UK’s health system. The MAC highlights, however, the urgent need for DTI to approve funding for infrastructure if this is to be realised.
- Measurement for Emerging Technologies – The MAC welcomes this new programme, which it understands, will respond flexibly and in a timely manner to the inevitable successes and failures of work on emerging technologies. The MAC applauds the unprecedented industrial and academic involvement in the programme.

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:

- Watt Balance project – Given continuing concerns over delivery, the MAC conducted a detailed review and made recommendations to increase the prospect of the project delivering value for money and of NPL maintaining a competitive scientific capability.

2. DISCUSSION

2.1 THE WATT BALANCE

In general MAC considers that the monitoring of specific projects is outside its remit however the Watt Balance project is unique – it is a high profile, potentially high cost, metrological challenge that is currently co-funded by three programmes. It is a long-term project that seeks to contribute to changing the definition of one or more of the SI (Système International d'unités) measurement units.

The advice of the MAC regarding continued funding of this project was first sought in 2003 – 2004 and support was given with several caveats arising from concerns over project management and delivery.

The MAC remained concerned about a number of aspects of the Watt Balance project, expressed in the 2003-2004 annual report, and requested further information from NMSD. This annual report reflects views developed as a result of that further, very detailed report:

- Both Mark II and Mark III instruments are considerably behind plan. The planned comparison with early data obtained in 2001 and 2003 is expected to be at least 3 months late and certainly restricted in scope. The delivery design of the Mark III slipped substantially at each six-monthly report presented to the MAC and is now around 9 months behind schedule, at one year into the programme.
- Actions should be devised to limit further slippage on Mark II particularly as extra risks to the timeframe have been introduced, including diverting resource to a previously out of scope international comparison study.
- The Mark III project plan includes additional risk reduction steps. However, more allowance should be made for planned tasks taking longer than was envisaged in 2004, in light of past experience. The plan for an expanded team and manager focused only on the Mark III is welcomed.
- Although NPL remains confident that the new building will be adequate for its needs it should continue to monitor the performance and explore alternatives as a contingency.
- NPL's latest indications are that work on the Watt balance will cost £2.7 million (excluding capital costs) over the 5 years starting October 2005. The original estimate in October 2002 was that the operation of Mark III would cost £250k per year over a period of 15 years. MAC recognises that the increase rate of spend over the next 5 years is to recover slippage in the programme and to speed up the work in order to meet a deadline of 2011 recently proposed by the Consultative Committee of the CIPM (Comité International des Poids et Mesures).
- In spite of the prestige of this project, the MAC feels that the new rate of spend should not divert funds from other NMS programmes and re-iterates its recommendation that NPL more actively and creatively seeks wider external funding.

We believe it is important to implement our recommendations on collaboration and project management if the project is to succeed. The MAC recommendations to address these challenges continue to be:

- Expand the scope of the project advisory group to that of a steering group
- Ensure that this group is informed and consulted regularly and frequently, with recommendations followed

- Provide active and challenging monitoring of progress against plans

In summary the MAC continues to believe that the Watt Balance is one of the most exciting and prestigious – and increasingly high profile - challenges in modern metrology and it recognises that any such project will have a high level of technical uncertainty that affects the ability to deliver to a planned time-frame. We make a number of recommendations to NMSD to restore confidence, and our future support for this challenging project is conditional on their effective implementation. Our continued support for this challenging project rests on effective project management by NPL and more appropriate monitoring of the project by NMSD.

2.2 LINEAR ACCELERATOR FOR RADIATION DOSIMETRY

In its last report (Annual report 2003/2004), the MAC identified the need for the urgent replacement of the NPL research linear accelerator (LinAc) that is also used for radiotherapy dosimetry standards and calibrations. The DTI 's capital expenditure plans include the refurbishment of the LinAc building whilst the Science Contract between Serco and the DTI requires that Serco replace the equipment. Discussions with the Department of Health (DoH) are anticipated to result in DoH funding the purchase, installation and commissioning of a radiotherapy LinAc facility at the NPL in advance of the decommissioning and replacement of the current research LinAc, so that the vital radiotherapy calibration services are not interrupted and accelerator resources can be expanded to meet the demand. However, this collaborative, co-funded venture will only be achievable if the DTI approves funding in the near future for the new bunker that is needed to house the radiotherapy LinAc.

2.3 MSF TIME SIGNAL

DTI gave NPL permission to start a procurement process for the broadcast of MSF for ten years from 1st April 2007 on the 21st December 2004. The NPL intends to negotiate a contract that is broadly comparable with the existing service, both in coverage and functionality – an outcome that MAC strongly recommended and has persevered over the last two years in assisting DTI to achieve this objective. While the committee is pleased that permission has finally been granted for the procurement process the delay means there is no contingency. The timetable is now very tight if a new site is to be identified, built and operational by 1st April 2007.

During the procurement process MAC recommends that opportunities be sought to co-locate MSF with any Loran signal that may be broadcast by the Lighthouse Authorities – with the intention that, during the early part of the contract, DTI could explore whether Loran could broadcast a similar signal and hence replace MSF at the end of the contract.

The MAC was particularly concerned that the options for MSF were raised too late, beyond the deadlines to allow genuine strategic planning by exploring other options. However DTI has advised the MAC that the next review process will be initiated earlier in the procurement cycle; the need for the MSF time signal will be reviewed in 2010, with a view to announcing a decision by March 2011 on whether the service should continue beyond 2017.

2.4 NEW PROGRAMME: MEASUREMENT FOR EMERGING TECHNOLOGIES

This is a new programme, which aims to provide the measurement capability necessary to support new and emerging technology, especially in areas highlighted by the Key Business Technologies Unit and by the Research Councils.

Before formulation of this programme members of the MAC recommended several changes from the structure and management of traditional SI unit programmes. In particular they strongly recommended much closer engagement with a wide range of industry and universities and involvement of the Research Councils to ensure that measurement issues

associated with, for example, the Research Councils' Basic Technology Programme would be addressed. Furthermore assurance has been sought from NMSD that this programme will have the flexibility to respond in a timely manner to the inevitable successes and failures of work on emerging technologies. NMSD has agreed that funding may be transferred from projects that do not live up to their early promise, say where the project manager fails to build the collaborative links expected, to new projects, solicited to fill gaps identified in the programme.

The Advisory Committee is delighted with the response to this advice. This programme represents an excellent example of what can be achieved with appropriate resourcing and timely engagement with independent expert advisors. There is unprecedented industrial and academic involvement in the programme – including help in the formulation and workshops, in financial support for the research and in willingness to play an active role in project monitoring. The programme manager of the Research Councils' Basic Technology programme is a welcome member of the Working Group.

2.5 KNOWLEDGE TRANSFER

The Innovation Report, published by DTI in December 2003, committed the NMS to carry out a number of activities, namely secondments, Joint Industry Projects and Product Development assistance to SME's. These activities are to be welcomed and have been introduced successfully. Unfortunately, at the beginning of this financial year it became clear that no new money was to be provided to fund these new activities and NMSD therefore cut previously planned Knowledge Transfer activities in order to deliver them.

The MAC is greatly concerned that a major change of priorities was made in a timescale that NMSD felt did not allow for prior discussion with MAC and the KT Working Group.

2.6 NATIONAL MEASUREMENT AWARDS

MAC was particularly concerned at the decision not to continue the National Measurement Awards after November 2004, as it considers the Awards Scheme to be a valuable and potentially cost-effective means of raising the profile of the NMS. At MAC's request NMSD considered some alternative methods of delivering an Award Scheme but rejected them as not producing the savings they hoped to achieve or the impact required. MAC's view is that further consideration should be given to reinstating National Measurement Awards and a wider range of solutions considered. The committee would be pleased to consider ways to help bring this about.

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), with an expenditure for 2004/2005 of £60.4 million, split between the programmes as shown in the following figure:

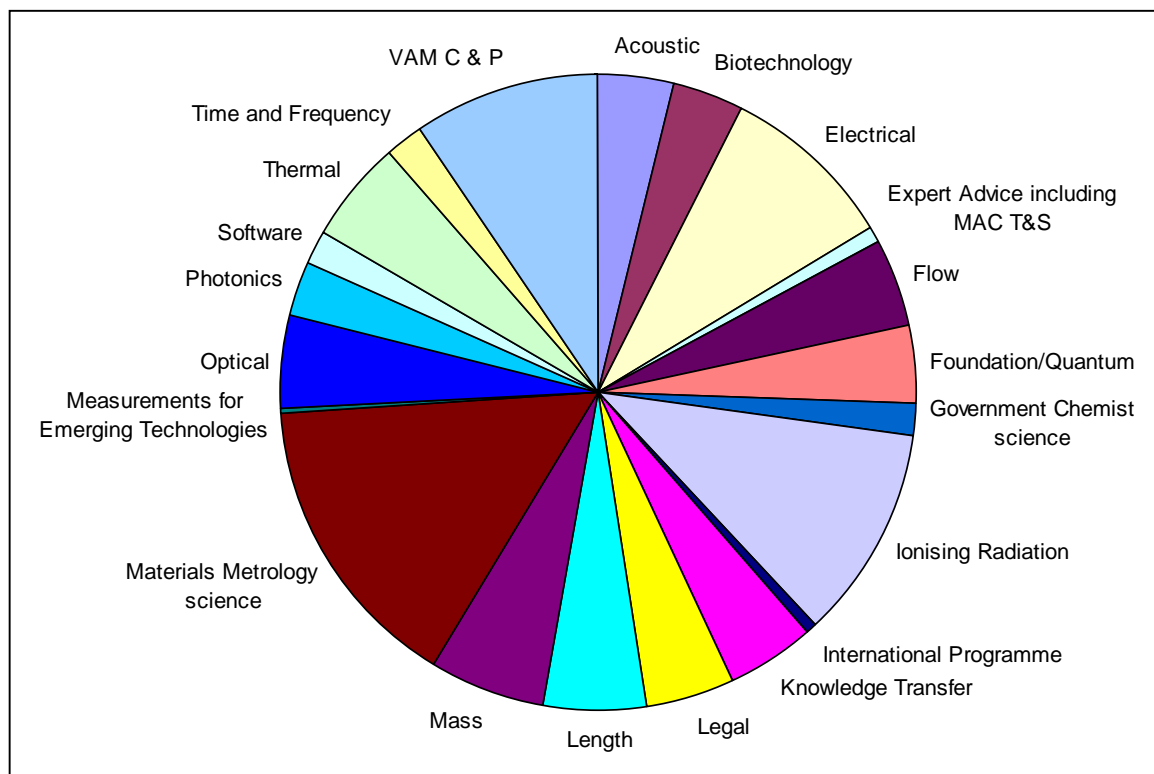


Figure 1 Summary of NMS programme expenditure, 2004-2005, by programme

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-term forward projections;
- 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 2005

Chairman

Dr. Colin Gaskell CBE
Royal Academy of Engineering

Dr. Alan Johnson
Emerson Process Management

Dr. Roger Jones
GE-Druck Holdings plc

Independent Members

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

Mr. John Latham
Coventry University

Dr. Peter Bleasdale
BNFL

Mr. Steve Lower
Sira Test and Certification Ltd

Mr. Michael Buckley
South Yorkshire Trading Standards

Dr. Janet Townsend
PA Consulting Group

Dr. Peter Cowley
Quarndon Cognition Limited

Dr. John Tyrer
Loughborough University

Prof. Les Ebdon
University of Luton

Representatives from Other Government Departments.

Mr. Richard Freeman
The Precise Group

Dr. John Dennis
Department for Environment, Food and Rural Affairs

Prof. Ken Grattan
City University

Mr. Cliff Double
Department of Health

Mr. David Holmwood
Universal Instrument Services Ltd

Mr. John Hunt
Ministry of Defence (RAF)

Dr. John McGuinness
Health & Safety Executive

Dr. Colin Gaskell retired after a three year tenure and his active contribution as chairman has been appreciated by the members. Mr. Mike Buckley and Mr. David Holmwood are also retiring from the MAC. Dr. David Elix resigned after the October 2004 meeting.

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 2004/2005 on MAC and its Working Groups, a total of more than 150 members, was £105,500, including costs associated with the definition and establishment of the new programme, MET.

6.2 RESOURCES

Members of the MAC invest around 10 days effort per year on average, with some contributing several man weeks, making a total of around 150 days of effort by MAC members in advising and supporting the DTI (NMSD) during 2004/2005. Additional effort expended by the approximately 130 working group members may contribute more than a further 300 or more days of effort annually.

6.3 PROGRAMME OF ACTIVITIES

MAC and its working group members provide continuing advice and support 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 Coventry in October 2004 and York in March 2005. We wish to thank John Latham and John Dennis respectively for hosting the events at the Coventry Technopark and the Central Scientific Laboratory in York.

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 2004/2005 the following programmes were formulated:

- Legal Metrology
- Acoustic
- Ionising Radiation
- KT/Measurements for Innovators
- Government Chemist
- MET
- Materials Processability

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.