

# Government Ownership Contractor Operation of The UK's National Physical Laboratory A Septennial Report

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## Abstract

The 1990's saw more change in the UK's national metrology infrastructure than at any other time in the last century. At the beginning of the 1990's, the UK government's Department of Trade and Industry (DTI) owned and operated an extensive network of laboratories with a long history of scientific success. However it was government policy to transfer operational assets to private ownership or operation. DTI saw its role as supporting fostering a thriving science base, without necessarily owning it. In the case of the National Physical Laboratory (NPL), the UK's national standards laboratory, DTI decided to continue with Government ownership but with the introduction of private sector management. This model is known as Government Owned Contractor Operated (GOCO). In 1995, DTI awarded the contract to operate NPL to NPL Management Ltd (NPLML), a wholly owned subsidiary of Serco Group plc. All NPL staff transferred to NPLML and all operations, both scientific and support, became the contractual responsibility of the company. This paper will review seven years' experience of this initiative. Key issues addressed will include:

- Managing cost reduction and growth
- Improving the quality of programme development and delivery
- Sustaining the mission and scientific excellence
- Making partnership with Government a reality
- Evolution in staff management and structure.

The paper will conclude by examining the impact of GOCO operation on the performance of NPL as the UK's national standards laboratory and considering the future of the laboratory under this arrangement.

## Background

As the UK's national standards laboratory NPL underpins the National Measurement System, developing, maintaining and disseminating the UK's physical measurement standards to ensure accuracy and traceability of measurements throughout the economy and maintain consistency with our trading partners.

In fulfilling this mission NPL, operating from its facilities to the south west of London, has been recognised since its creation in 1900, as a world-leading centre for the development and application of physical measurement technologies.

The British Government's Department of Trade and Industry (DTI) is both NPL's owner and major customer. DTI's NMS programme objectives are met through a series of three-year programmes. There are currently 16 DTI contracts, each running on a phased three-year

cycle. Single tendered work for DTI accounts for some 65% of sales. In addition, NPL offers the UK's most lowest-uncertainty measurement services; manages competitively won science and knowledge transfer programmes for Government; and partners industry to deliver contract research, development and consultancy services.

In 1995, the Department of Trade and Industry awarded a contract to operate the Laboratory to NPL Management Ltd (NPLML), a wholly owned subsidiary of Serco Group plc.<sup>1</sup> This was originally a five-year contract, recently extended to seven years. All operations, scientific and infrastructural, are the contractual responsibility of NPLML.

This paper reviews the experience of this outsourcing initiative.

### **Changes in DTI laboratory ownership in the mid-90s**

The 1990's saw more change in the agencies responsible for delivering national metrology programmes than at any other time in the last century.

At the beginning of the 1990's, DTI owned and operated a network of laboratories, including NPL. However, as DTI focused increasingly on creating the policy framework to foster a thriving science and industrial base, it took a policy decision to exit from the operation of scientific assets by transferring them to the private sector.

In the mid-90s a variety of privatisation models were applied to the DTI laboratories. Two were fully privatised: the National Engineering Laboratory through a trade sale and the Laboratory of the Government Chemist by sale to a management-led consortium. DTI decided that the National Weights and Measures Laboratory (NWML) should remain in the public sector, reflecting the need for independence in legal metrology.

### **The GOCO option for NPL**

In the case of NPL, the consultants' report considered three options:

1. Status Quo – Government owned and operated
2. Continued public sector ownership, but appointing a private sector management contractor, to create a Government Owned Contractor Operated (GOCO) entity.<sup>2</sup>
3. Full Privatisation.

Government selected Option 2. The GOCO model was seen as offering the most favourable financial option. It allowed DTI to retain strategic control as owner, to benefit from cost reduction through commercial management, but to retain freedom to change contractors. And it could be implemented quickly.

Five consortia competed to operate NPL as GOCO. Serco's special purpose company, NPLML won the contract, which came into effect on 1 October 1995. A five-year contract was awarded<sup>3</sup>, with a fixed "guarantee" of available programme funding for the term of the contract. A small management team from Serco (six senior managers with

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<sup>1</sup> Serco is a highly successful, UK task management company, with more than 30,000 employees worldwide.

<sup>2</sup> GOCOs have been quite widely applied in the USA, but had been deployed only once before in the UK.

<sup>3</sup> The contract was subsequently extended by 33 months.

a mix of private and public sector experience) transferred to the company, along with 570 NPL staff, whose employment rights were protected by law. All major assets remained in government ownership.

### **Facing up to the risks**

The Serco team bidding for the contract recognised a number of risks in taking NPL into the GOCO arrangement.

Serco accepted significant commercial risk. The contract was awarded on the basis of competitively proposed man-day prices, fixed (without provision for inflation) for the term of the contract. DTI required NPL to deliver more scientific activity at a reduced price, presenting the challenge of delivering simultaneous cost reduction and commercial growth.

Further institutional and programmatic risks were identified ahead of the contract, including:

- Failure to maintain quality of programme delivery, if cost reduction decisions were misdirected.
- Reduced scientific quality, possibly through the loss of key scientists who might be concerned about employment in the private sector.
- Diminished international status, if there were lack of trust among NPL's peers.
- Erosion of reputation for integrity and independence, if NPL competed unfairly with industry.
- Failure in the partnership between owner and operator, vital to success.

In discussion with DTI, it was clear that government shared this view of the risks and was equally committed to ensuring that they were mitigated through a successful partnership contract. The rest of this paper considers how, as a GOCO, NPL has performed in these critical success areas.

### **Delivering cost reduction and business growth (and sharing profit with the Government!)**

NPLML has achieved significant cost reduction and sales growth during the period, resulting in an effective 25% decrease in science man-day rates charged to DTI. To date more than \$30M has been saved by the UK Treasury as a result of the contract. Cost reduction was delivered in large part through a review of overhead costs and organisation structure.

Increased sales have been required both to reduce the proportion of infrastructure costs borne by DTI and to maintain a flourishing organisation. DTI single tender funding has remained static in real terms (at around \$50M), so it was clear from the outset that growth would have to be built upon a programme of competitive business development. Under the terms of the contract, growth had to be achieved without abuse of the Laboratory's unique position to compete unfairly: undoubtedly a very fine line to tread. However, in the seven years to date there has been only one recorded complaint about NPL's trading activities impinging on a private company.

Between 1995 and 2001 commercial income has trebled from \$10M to \$30M. New processes have been introduced to ensure greater commercial discipline in bidding and contracting. Fruitful markets for growth have included environmental and space projects; and the

laboratory has established strong product development partnerships with instrumentation and telecommunications companies. The volume of measurement services has also increased significantly.

A profit share agreement was negotiated with Government. This is a simple and transparent mechanism, by which a significant cash contribution has been returned to DTI by NPLML over the period of the contract.

Cost reduction and business growth have provided a basis for growth in staff numbers. A total of 570 employees transferred at contractorisation. Today there are more than 700 employees, with almost all recruitment being of young high calibre scientists. This has produced an improvement in the laboratory's age distribution, reversing a deterioration created by a recruitment moratorium in the years leading up to contractorisation. The threat of resignation by key staff has not materialised, but the Laboratory does face challenges in recruiting and retaining young scientists due primarily to the costs of housing in the Teddington area.

### **Improving the quality of programme development and delivery**

Under contractorisation, each of the DTI programmes already referred to became subject to a fixed price, milestone-based contracting regime; and there was a requirement to improve quality control on the project axis. The NPL experience has been that even fundamental physics research can be successfully undertaken within a fixed price project management framework, if planned intelligently. NPL's record on milestone delivery is strong; and has to be since cash flow depends upon it!

NPLML was set the formidable challenge of securing certification to ISO 9002 and UKAS 17025 accreditation within the first year of contractor operation. Building upon but developing the existing Quality Management System, these were secured in 9 months. A major project management-training programme has been instrumental in supporting improved performance.

Every new programme is developed under an 18-month formulation process involving extensive stakeholder consultation and a qualitative evaluation of programme benefit and rationale. NPL has integrated this programme development cycle with Capital and Human Resource planning.

### **Maintaining commitment to scientific excellence and international cooperation**

While the introduction of commercial management processes was essential, it was vital also to maintain the commitment to the scientific values and mission, which have historically driven excellence in national laboratories.

Scientific quality and capability maintenance are monitored not only by the DTI's Measurement Advisory Group, drawn from industry, but through regular inspections by a committee especially appointed by the Royal Society and the Royal Academy of Engineering, the UK's most prestigious scientific and technical institutions. The scientific reviews have been positive and given excellent advice about the orientation of the Laboratory's work. NPL has continued to make major scientific breakthroughs, for example

in ion trapping and digital coincidence counting; and in applied fields, such as metrology and virtual materials testing.

NPL has reviewed its record in refereed research publication and believes that output should be increased, although publication via NPL Reports and the Website, giving end-users the earliest possible and most practical access to NPL's knowledge output, remain the primary dissemination pathways.

There has been a strong commitment, led by Dr Andrew Wallard, to developing relationships with international peers. Key features have been:

- An active role within CIPM and its committees
  - High level involvement in NCSL
  - A key role in the Mutual Recognition Arrangement signed by all national standards laboratories in 1998
  - Leadership within the EUROMET regional collaboration.
  - The creation of an International programme, funded by the UK Government.
- A review in 1999 concluded, "contractorisation has not diminished the international standing of NPL".

### **Cultural issues**

The pervading culture at NPL, developed within the UK's Scientific Civil Service had much to commend it: a devotion to science of the highest quality, a commitment to fairness in employment, a belief in the value of the mission. The new management team were concerned not to undermine any of these strengths and an evolutionary approach has been adopted.

However, there were some cultural and organisational issues that were potentially inhibiting the laboratory's performance. The number of tiers of management were inhibiting decision-making and junior staff, in particular, could feel distanced from responsibility for their work. Two layers were therefore removed from the management structure; and more open, informal processes introduced for engaging and communicating with employees. Branch Heads that once reported to the Director through two intermediate directorate tiers, now report directly to the Managing Director as Heads of scientific centres. Each centre has autonomy combined with accountability for scientific, financial and business performance.

A second important cultural issue involved communication with the world of measurement users beyond NPL's walls. While there were notable individual exceptions, the general culture at NPL was historically somewhat introspective and introverted. This is clearly a barrier to successful knowledge transfer and the mission imperative to add value for UK measurement users in industry and elsewhere.

A significant effort has therefore been devoted to introducing more mechanisms for staff involvement communicating and partnering with industry, including programmes of national road shows and measurement awareness campaigns, as well as growing the number of user clubs and networks for the dissemination and application of outputs.

## **The partnership with Government**

Perhaps the biggest potential threat to the GOCO initiative was that DTI and NPLML would fail to establish a practical partnership to take forward the Laboratory. However, the practical elements of the partnership have stood the test of time.

There is Open Book Accounting. DTI have unlimited on-line access to NPL's new Business Information System from their London offices. DTI have right of attendance at NPL Board meetings; and a comprehensive suite of performance metrics is in place.

The relationship has evolved as a basis for continuing innovation, both in the creation of new programme areas, such as Photonics, Bio-metrology and Knowledge Transfer; and in managing infrastructure. For example, an innovative approach to asset leasing, developed by NPLML, was introduced after agreement with the Treasury.

DTI's commitment to the future of the Laboratory is evident in its willingness to sponsor a complete renewal of the Laboratory's physical infrastructure. Like most UK national laboratories, NPL had developed organically over many decades and the current estate of more than 50 operating buildings has been proving increasingly costly and inefficient. DTI has therefore entered into a 25-year contract, funded through a Private Finance Initiative, with the LASER consortium. LASER is building a new 36,000 square metre national laboratory facility on the Teddington site to house all NPL operations from 2003.

## **Conclusions**

Contractorisation of NPL was potentially risky. Scientific integrity and quality could have been jeopardised, independence and mission focus might have been eroded; key staff might have left; and international cooperation might have been withdrawn by other, publicly owned and operated national standards laboratories. None of these fears has been realised.

There are areas in which NPL can do better. It is clear, for example, that NPL can be more focussed in investing for scientific leadership in key research areas; and in managing the exploitation of intellectual property. A major strategic exercise was initiated last year to refresh the Laboratory's vision and set out clear practical steps to realise it.

However, NPL today has more income and staff than in 1995, retains scientific excellence (but is more focused on meeting the needs of the UK economy); and is preparing to transfer into one of the world's most sophisticated, purpose-built metrology facilities.

The future will of course present further challenges. To name just three:

- The increasing internationalisation of metrology; with potential for standards devolution in Europe and beyond
- The contest to attract young scientific talent; and
- The need for further growth in commercial partnerships with business, while retaining the laboratory's independence.

However, Government's commitment to NPL's mission and the organisation's ability to fulfil it remain strong.