

I am appalled  
that after all our  
efforts such  
gross inefficiency  
exists

PRIME MINISTER

Prime Minister

- (1) Agree to endorse Derek Rayner's recommendations at paras 5 to 8 below? They are set out in more detail at Para A.
- (2) Agree with Lady Young's proposal at B to publicise this review before the end of the month? Yes -

WR  
11/6

REVIEW OF SUPPORT SERVICES IN RESEARCH AND DEVELOPMENT AND ALLIED SCIENTIFIC ESTABLISHMENTS

In January 1981 you agreed that the then Lord President should set in hand this review and that I should co-ordinate it. I now attach my report.

2. Six Ministers (Agriculture, Defence, Environment, Industry, Overseas Development and Transport) appointed examining officers to work on scrutiny lines. In all the review covered the work of over 8,000 staff, around 40% of the support staff in Government R & D Establishments.

3. "Support Services" refers to activities ranging from complex computer facilities, through workshops and stores, clerical and cleaning. In a typical establishment they are about half the cost.

Findings

4. The identified savings amount to 1,518 posts (19%) and £14m a year (14%). There is one main theme. Too often, no one is responsible for asking whether the money spent on support services is well spent: research workers make demands; the managers of support services see their task as simply to meet these demands to the maximum extent. The result is:

- overprovision of services (eg stores where the staff generally spend half their time or less, sometimes as little as one hour a day, on essential stores duties; stock levels which in one case meant that 65% of the lines were held in excess of one



year's supply - including 24 years' supply of embossing tape);

- waste of land and buildings (eg 60,000 square feet of office accommodation which can be given up at a single establishment);
- unrealistic charges (eg work for businesses budgeted at less than cost and the general taxpayer left bearing too great a share of the bill);
- lack of cost-awareness (eg lumping support into general overheads - which contrasts markedly with private sector research centres where it is usual for costs, wherever they occur, to be recorded against projects);
- too much bureaucracy (eg procedures for issuing stock and stock-taking which double the purchase price).

#### Recommendations

5. I recommend a package of managerial reform to tackle these shortcomings. I am in no doubt that reform needs to be started from the top. The establishments concerned are relatively isolated, sometimes physically and often in organisational terms. The temptation is to impose more and more detailed day to day controls from the centre of the department. But that is precisely the kind of control which has failed. I believe that what is needed is clear delegation of authority to levels at which it is sensible to expect managers to operate. This means changes in the role of top management, of line management and of the central authorities.



### Top Management

6. I believe there should be formal acts of delegation to Directors defining the purpose and scope of their establishments. Directors should have personal authority and responsibility for ensuring that only essential work is done, economically and to high standards. They should have a greater measure of freedom to manage, within their budget totals so as to achieve the desired results economically.

### Line Management

7. Within an establishment I recommend that the Director should involve research scientists in the search for value for money. The administrators' role should be directed towards more selective checking and audit. Individual research projects should be fully costed and their performance measured against cost and expected achievement.

### The Centre

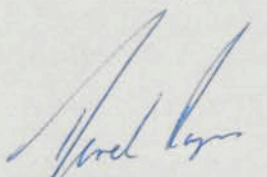
8. I believe the centre of Government can do more to encourage departments towards economy and effectiveness. In particular, I recommend that the Treasury should investigate how a proportion of savings from greater efficiency can be re-invested to secure even better performance. I recommend that the Property Services Agency should pay greater attention to the specialised requirements of the research establishments. And I recommend that the Management and Personnel Office should take urgent action to review how suitable scientists can be identified and developed for management.



Conclusions

9. Once again we have seen unnecessary bureaucracy and costs which call for a determined effort, starting from the top, to demonstrate that economy and efficiency matter. The savings are there if the will to achieve them is there. Also, once again the civil servants have shown that, if given a lead, they have the ability and the determination to secure good management in Government establishments.

10. I have shown this minute to Janet Young, who will also minute you about the report, and am copying it to Geoffrey Howe, John Nott, Peter Walker, Michael Heseltine, Patrick Jenkin, David Howell, Neil Marten and to Sir Robert Armstrong and Sir Douglas Wass.

  
DEREK RAYNER

9 June 1982

CONQUEROR



PRIME MINISTER

## REVIEW OF R & D SUPPORTING SERVICES

I support Sir Derek Rayner's recommendations about the management of Government Research and Development Establishments covered by his minute of 9 June. I believe both Sir Derek Rayner and the civil servants involved deserve our praise.

I am very grateful to the Ministers who have taken part. The review has been very successful. It underlines the versatility and power of this kind of approach. The prescription ranges from how we can be sure of value for money from research projects - which you particularly queried when approving the review - to the responsibility and authority we should put on individual scientists in the establishments.

### Implementation

The first task is to implement the specific recommendations of the departmental teams. Sir Derek Rayner proposes the preparation by the Ministers concerned of action documents, including action to extend the specific lessons to establishments not in the sample. I agree with this and suggest that they should also show how Departments will implement the recommendations in Sir Derek Rayner's own report. I propose to send you a report on all the action following from this review in a year's time.

I shall pursue the question of how to select, train and develop suitable specialists for managerial responsibilities. The MPO has already started on this for scientists.

I much welcome the impetus which this review gives to the question of ploughing back some part of efficiency savings, on which I had already exchanged some early ideas with the Chancellor of the Exchequer.

I would like to draw colleagues' attention generally to what has been achieved as well as to the follow-up required. The emerging success of this review led to the current programme of resource control reviews which form part of our efficiency strategy for 1982 and I will come back later in the summer with proposals for keeping up the momentum into 1983.

### Financial Management Initiative

The messages about clear responsibility and delegation down the line support the Government's financial management initiative. But I am sure that Ministers will not want this major task to get in the way of early progress on the research establishments. I propose that we

should ask departments to include the establishments among their priority areas in the initiative; indeed, the Minister of Agriculture has selected the Central Veterinary Laboratory as one of his four "priority areas" in following up the Coopers & Lybrand report.

### Publicity and Timing

There is a good story to tell but it needs careful handling. I personally attach great importance to making it clear that we are in no sense launching a generalised attack on the Civil Service.

*we and should be highly*  
Departmental Ministers will rightly be keen to tell their own story. Without compromising them, I propose to get across the wider messages now:

- better value for money with good savings for the taxpayer through more cost effective control;
- fewer civil servants;
- scope for more savings in other establishments.

*critic of  
this situation  
not*

What I have in view is arranged Parliamentary Answers and a press notice when the report is made available. I propose myself to brief selected journalists, accompanied by Sir Derek Rayner (if available) and by officials who have worked first hand on the review. I would want to say that the Government accepts Sir Derek Rayner's recommendations and will be pressing ahead to implement them.

I hope you will agree to an early announcement well before the end of this month. This would establish that the central efficiency drive is still very much in business before we publish our response to the Treasury and Civil Service Committee report on the Civil Service (probably July). Yet it will leave the way clear for Departments to handle their own publicity when they are ready.

I am copying this to the Chancellor of the Exchequer, the Secretary of State for Defence, the Minister of Agriculture, Fisheries and Food, the Secretaries of State for the Environment, Industry and Transport, the Minister for Overseas Development and to Sir Derek Rayner, Sir Robert Armstrong and Sir Douglas Wass.

*Baroness Young*

BARONESS YOUNG  
9 June 1982

...of ... ..  
... ..  
... ..  
... ..

... ..

... ..  
... ..  
... ..  
... ..

... ..  
... ..

... ..

... ..

... ..  
... ..  
... ..  
... ..

... ..  
... ..  
... ..  
... ..

... ..  
... ..  
... ..

JUN 1982

6 6 6 6 6 6 6 6 6 6

...

1

---

**REVIEW OF SUPPORT SERVICES  
IN  
RESEARCH AND DEVELOPMENT  
AND  
ALLIED SCIENTIFIC ESTABLISHMENTS**

---

**Report to the Prime Minister**

**Management and Personnel Office  
June 1982**



## PRIME MINISTER

### REVIEW OF SUPPORT SERVICES IN RESEARCH AND DEVELOPMENT AND ALLIED SCIENTIFIC ESTABLISHMENTS

#### Introduction

1.1 In January 1981 you agreed that the then Lord President should set in hand this review and that I should coordinate it. This report is to inform you of the findings and to make recommendations aimed at ensuring better management and better value for money in the establishments.

1.2 "Support services" refers to a range of activities from complex computer facilities, through workshops and stores to clerical and cleaning services. They are used by the scientists and technologists who actually do the R&D work. In a typical establishment about half the costs and rather more than half the staff are engaged in support activities.

1.3 Six Ministers (Agriculture, Defence, Environment, Industry, Overseas Development and Transport) took part in the review by appointing examining officers to report on the support services in one or more of their establishments. Relevant topics were also chosen by Ministers for the 1981 scrutiny programme - the Forensic Science Service in the Home Office and Fisheries Research in Agriculture and the Scottish Office. These scrutinies covered the full range of activities in the relevant establishments.

1.4 The examining officers worked on scrutiny lines, in particular going to where the work was done to see and hear for themselves and to ask radical questions. Most also drew heavily on a range of specialised help. Management Services specialists, then in the Civil Service Department (now in the Management and Personnel Office) and the staff of the Director General of Management Audit in MOD, played notable parts. Accountants and private sector consultants have made important contributions to some of the studies.

1.5 The review has involved an immense amount of hard work and I commend the examining officers and their helpers. All their reports are now with their Ministers. Staff in the establishments concerned co-operated well. Thanks are due to the many people there who explained their work, problems and ideas to the examining officers. Mr F H East, (a former Director of the Royal Armament Research and Development Establishment) provided invaluable advice and guidance.

1.6 A small central team of officials was set up in the then CSD (now MPO) to coordinate the work of examining officers day to day. They were Mr A J Payne and Mr A C Stott, helped by Mr C R Evans (a senior scientist loaned by MOD) and Mr A M Ellis. I am grateful for their hard work. The task was overseen by Mr R H Wilson in CSD (until October) and by Mr I B Beesley in my own unit. These two officials, you may recall, also oversaw the Statistics Review. I have again found their help invaluable.

1.7 The review has cost about £350,000 - excluding the time of those consulted in the establishments.

## Findings

1.8 The review covered the work of over 8000 staff. This is around 40% of the support staff in R&D establishments. The coverage and proposed savings (in 1981/2 prices) are as follows:

Department and Establishment	Support Staff and cost pa	Proposed Savings in staff and cost pa	Proposed once and for all savings
Agriculture (Central Veterinary Laboratory)	358 £7.4m	85 (24%) £1.2m (16%)	£3.9m
Defence (Selected support Functions in 12 Establishments)	6004 £57m	1098 (18%) £7.5m (13%)	£2.75m
Environment (Building Research Establishment)	540 £6.8m	116 (21%) £1.7m (25%)	
Industry (National Physical and Warren Spring Laboratories)	578 £15.5m	90 (16%) £1.4m (9%)	
Overseas Development Administration (Tropical Products Institute and Centre for Overseas Pest Research)	228 £5.5m	23 (10%) £0.5m (9%)	
Transport (Transport and Road Research Laboratory)	407 £7.0m	106 (26%) £1.7m (25%)	
<b>TOTALS</b>	<b>8115 £99.2m</b>	<b>1518 (19%) £14.0m (14%)</b>	<b>£6.65m</b>

Capital assets also figure in the recommendations. Some 270 acres of land, 450,000 square feet of storage, workshop and office space and 200 vehicles have been recommended for disposal (See Annex 1).

1.9 Absolute precision in this sort of exercise is of course impossible. The above figures represent examining officers' best estimates. There may be the odd over-estimate. But there are also some estimates of cash savings which I suspect may be modest - particularly where large numbers of staff and large areas of accommodation are involved. Overall, in today's prices, I feel confident that we have good prospects for savings about £1.5m a year and £7m once for all.

1.10 The Home Office scrutiny examined all the activities of the Forensic Science Service's six operational laboratories together with the Central Research Establishment and the research element of the Metropolitan Research Laboratory. The scrutinies of fisheries research in MAFF and the Scottish Office covered the full range of work undertaken in the Directorate of Fisheries Research, the Tory Research Station and the Department of Agriculture for Scotland's laboratories at Aberdeen and Pitlochry. The results of these scrutinies will be reported separately.

1.11 The findings summarised in para 1.8 are based on examination of some or all of the support services in 18 of the Government's 25 largest establishments and one small establishment (the Centre for Overseas Pest Research). It is usually hazardous to extrapolate the identified savings into areas not covered. But the degree of commonality in the findings gives me confidence that the same factors may be present in the areas not covered by the review. Thus if Departments are able to apply the lessons of the review rigorously, there could be additional savings of as much again.

## SECTION 2 - GOVERNMENT RESEARCH AND DEVELOPMENT

### Government as Customer

2.1 On the international standard for comparisons, total UK spending on R&D is about 2% of GDP. This is much the same share as for our major industrial competitors but in absolute terms only about half that of faster growing competitors like Germany and Japan. Government spending accounts for about half.

2.2 The 1981-2 Estimates (which use a wider definition than the international comparisons) provided over £3,300m for R & D (Annex 2a). Large as this sum is (over £1 a week for every man, woman and child in the United Kingdom) the German and French governments spend a good deal more (see Annex 2b). The most notable feature of our Government R&D spending is the dominant position of Defence, which accounts for more than half the total (Annex 2c).

2.3 R&D is financed by Government in broadly two ways:

1. DES makes funds available to the scientific community, i.e. Universities, Research Councils etc (about £800m in 1981-2). This is usually for research undertaken to advance knowledge.
2. Applied R&D, accounting for the remaining £2500m, is promoted by each Department on the scale and pattern which each judges to be most appropriate to the formulation and pursuit of Ministers' policies.

2.4 Government policy on applied R&D is built on Lord Rothschild's "customer-contractor principle" set out in the White Paper "A Framework for Government Research and Development" (Cmd 5046-1972). Departments, as customers, define their requirements for R&D to support their policy objectives; contractors advise on the possibilities of meeting them and undertake the work.

### Government as Contractor

2.5 There are over 70 Government R & D establishments. Their fields of work range from nuclear weapons and the effects of corrosion on concrete to the growing of anemones. They range in size from 25 staff in some MAFF experimental farms to over 5000 in the biggest Defence establishments. The establishments are also notable users of assets. Those involved in this review have between them over 25,000 acres of land and millions of square feet of buildings. In 1981/2 the establishments had a total of about 35,000 staff and costs of over £600m a year. They are very important contractors.

2.6 The effectiveness of Government spending on R&D, in its own establishments as well as in industry, depends on ensuring that the programme supports policies as closely as possible. This is a question of selecting sound and relevant projects to back; planning and estimating their costs well; monitoring technical and financial progress; and securing timely results. But the efficiency with which the various support services are provided and the attention given to costs in the establishments are also important to the Government's programme.

2.7 The types of support services covered in this review and the recommended savings are:

Type of Service	Nos. covered	Recommended savings	Costs covered (£m)	Recommended savings (£m)
<u>Domestic Support</u> eg security, cleaning, transport, messenger and estate services	1155	310 (27%)	21	3 (14%)
<u>Administrative Support</u> eg typing, clerical, messenger, reprographic, finance and personnel services	1950	360 (18%)	26	4 (15%)
<u>Specialist Support</u> eg stores, workshops, library, information and photographic services	5010	848 (17%)	52.2	7 (13%)
Total for 19 establishments participating	8115	1518 (19%)	99.2	14.0 (14%)

2.8 The scientific standards of our establishments are well known and well respected. A number are among the world leaders in their fields. But the review has identified scope for substantial savings, as high as 26% in support staff and 25% in support costs. The establishments have been subject not only to the usual Civil Service investigatory procedures such as staff inspection; but also to the operation of the customer-contractor principle. Responsiveness to cost and value added has not, however, reached commercial standards - certainly not those of the private sector research firms visited in the review (see Annex 3).

2.9 In what follows I offer my conclusions on what has gone wrong (Section 3) and what should be done (Section 4). I cannot do that without criticising much existing practice. Not all the criticisms which follow apply to all establishments, nor with equal force. Procedures, practices and management regimes are diverse. But the examining officers have found that there are widespread opportunities to reduce costs in the support 'tail' without damaging the research 'teeth'. The basic point that there is scope to continue with excellent research at less cost does apply to all.

## SECTION 3 - WHAT HAS GONE WRONG

3.1 The essential failure has been that too often neither the provider nor the user has clear authority and accountability for judging services in terms of value for money. The costs of most or even all support are frequently lumped into a general overhead rate rather than charged direct to the budgets of the projects or units which actually generate the costs. In these circumstances the individual manager of a scientific project is not aware of, or responsible for, the actual costs of the support he consumes. The charge to his project is the same however much or little he uses. There is little or no incentive to economy.

3.2 Some establishments, notably in MOD and D. Industry, have costing systems which give them a detailed picture of inputs. But even there some expensive services are charged to overheads rather than to projects. The MOD report noted that a Division Head's budget rarely gave him control and responsibility for more than 10% of the resources his Division consumed.

3.3 The managers of support services often see their task as simply to meet the demands of the research work to the maximum extent. They feel their performance will be judged very largely in terms of 'effectiveness'. Can they provide everything the scientists want, and promptly? A manager of engineering services told the central team "My job is to turn the scientists' dream into a reality" and the manager of a large experimental facility said "If we have to turn down anybody's request to run an experiment, we feel we have failed".

3.4 This failure to judge services in terms of value-added is I believe at the root of many of the shortcomings that examining officers have encountered. The main problems are:

1. over-provision of services;
2. too many services in-house;
3. waste of land and buildings;
4. lack of cost-awareness;
5. unrealistic charges;
6. too much bureaucracy.

I deal with each of these in turn.

### Over-provision of services

3.5 The review has produced many instances of services being provided at excessive levels. For example, 6, 7 or even 10 messenger rounds a day are found in almost all establishments. Two or three are usually enough, as the Atomic Weapons Research Establishment has shown. In some Defence establishments, staff are driven to meetings rather than using public transport or their own cars

- the report says that such drivers mostly "spend their days of detached duty merely awaiting the passenger's completion of the meeting". Judging by mileages recorded, establishments often had too many vehicles. At the National Physical Laboratory, a group of eight vans and estate cars had in a nine month period, averaged less than one trip a month each. The Transport and Road Research Laboratory had 24 Land Rovers and Range Rovers which on average made less than one trip a week each.

3.6 Stores are generally open and manned all day, often to make only a few issues of low value items. At the Building Research Establishment, six staff had an average of only 10 issues or receipts each to handle in a day. The MOD study reports that at six establishments "laboratory store staff generally spent half their time or less, sometimes as little as one hour a day, on essential stores duties".

3.7 Stock levels were often too high and equipment inventories overcrowded. At the Central Veterinary Laboratory, 65% of the lines stocked were in excess of 1 year's supply and 23% in excess of 5 years. (There was 24 year's supply of embossing tape.) "Lack of visibility of assets and high proportion of equipment not in use characterised the inventories" at six MOD establishments. At one of them (the Royal Signals and Radar Establishment) the 17,500 items on inventory included oscilloscopes, calculators and signal generators held in quantities of 10 up to over 500. Their average age was 8.7 years with many items over 20 years old.

3.8 Around 800 of the potential staff savings arise from adopting more realistic levels of service.

### Too many services in-house

3.9 There are some examples of the sort of sub-contracting practice found in good business. Defence establishments are contracting out cleaning. So is the Transport and Road Research Laboratory. The Chemical Defence Establishment costs its animal breeding carefully, monitors market prices and breeds or buys accordingly. But there is also a widespread conviction in establishments that outside suppliers should only be used when the internal service is too busy or cannot meet the technical requirement.

3.10 In my view this is a wrong and costly policy. A business does best by concentrating on its principal activity and those services critical to supporting it. Other services can usually be bought as required from those whose main business they are.

3.11 Almost all establishments were found to be doing something for themselves which the private sector could do cheaper - and often better. The air taxi service at the Royal Aircraft Establishment was about 25-50% more expensive than commercial air taxis, depending on the size of the aircraft used. At the Building Research Establishment and the Transport and Road Research Laboratory in-house security services cost twice as much as an adequate commercial service. The Central Veterinary Laboratory was breeding laboratory animals at between three and thirty times the market price. Laboratory rats for example, available outside at less than £2 each, were costing more than £30 to breed in-house.

3.12 Around 350 of the potential staff savings arise from making better use of the private sector.

#### **Waste of Land and Buildings**

3.13 Accommodation is very expensive. In the 1981-82 annual scrutiny of running costs, equivalent market rents plus rates, heating, lighting etc is estimated to account for 14.8% of total running costs. The accounts do not identify the total for all Government R&D Establishments, but assuming the same proportion it is around £100m a year.

3.14 Staff numbers in R&D establishments have generally run down over the last 5 years. Yet despite PSA's efforts (through Maintenance Economy Reviews for example) this review has found a number of cases where the space occupied has not decreased so quickly or indeed at all. Some lag is inevitable: but I believe Ministers should expect to see better progress.

3.15 In total, examining officers have recommended giving up some 270 acres of land and 450,000 square feet of buildings. The recommendations include:

- the National Physical Laboratory should rationalise and reduce its accommodation so that around 200,000 square feet of office, store and workshop space are disposed of, saving an estimated £635K a year;
- the Building Research Establishment should release one of its sites (26 acres) and over 100,000 square feet of buildings saving an estimated £340,000 a year;
- the Transport and Road Research Laboratory should vacate a good quality office building of 62,000 square feet. This would be worth about £5 a square foot in commercial rent. In total the examining officer estimates savings could be about £500,000 a year. 32,000 square feet of storage space should also be given up;
- the Central Veterinary Laboratory should give up 245 acres of farm land which are being used uneconomically for breeding laboratory animals.

3.16 PSA are aiming for substantial reduction in the size of the civil estate. From April 1979 to December 1981 the estate has been reduced by about 3,723,000 square feet (over 5%) and further savings of around 2,500,000 square feet are planned over the next 2 years (about 2% a year). Reductions on the specialised estate (such as laboratories etc) and similar property on the Defence estate are more difficult to achieve unless saleable lots are released. But the review has shown that there is scope for this and that useful capital receipts and savings in running costs can result.

3.17 The review's findings imply that PSA's efforts are hampered in two ways. First, departments currently have insufficient incentive to release underused assets. The move to repayment for PSA services should help. Secondly, it is difficult for PSA to shift 'sitting tenants' (sometimes the Departments own the property), or, as outsiders, to prevail against Departments' own views of their needs. I am pleased to see that the scrutiny process can challenge the need from the inside.

3.18 Another feature of the evidence has been criticism of the quality and promptness of services provided by PSA, partly reflecting specific failures, but also indicating a lack of effective liaison and effective working relationships between PSA and these specialised clients. Given that PSA is responsible for vast areas of government property and arranges millions of works orders a year - some 30,000 bill payments a day - it is not surprising if there are some complaints. And it is easy to underestimate the difficulties of getting prompt, good quality building work. But PSA accept that they could do better and I make recommendations in section 4 which are intended to improve matters.

3.19 From April 1983 Departments will be able to spend their own money on minor maintenance and new works. This will do something to reduce the discontent of those Departments which have had differences of opinion with PSA over work priorities.

#### **Unrealistic Charges**

3.20 Some establishments give away appreciable sums of public money by not charging for information (especially research reports) and advice. I accept that it is right and proper to disseminate the fruits of research. But many have a commercial value and I do not believe that the general taxpayer should bear all the costs.

3.21 The Building Research Establishment gives away more than 1½m pieces of information and publicity material a year and has a consultancy service which cost £300,000 in 1981 but earned only £150,000 in fees. The Central Veterinary Laboratory has a Memorandum Trading Account for the manufacture and sale of a biological product which gave a good reflection of true costs until recently but now "seriously understates the real cost of production". Inadequate charges are often made because establishments do not know enough about their own costs (see paragraphs 3.23-3.24). The ODA examining officer said, however, that "there are examples where work has been deliberately budgeted at less than cost in order to win contracts".

3.22 Specific recommendations to raise proper charges amount to a saving to the general taxpayer of some £700,000 a year.

#### **Lack of cost-awareness**

3.23 Present methods of costing support services frequently disguise the true costs of both the support and the research projects. Some important services, notably works and maintenance services from PSA, are currently provided "free" to most establishments. Either they do not fall on Departments' votes, or where they do they are not part of the Director's budget. Again, repayment for property services will help.

3.24 The practice of charging only the scientific manpower directly involved to projects, lumping support services into a general overhead, makes the Director's view of the cost of projects hazy. Charges for support are not necessarily in proportion to actual use. This is in marked contrast to private sector research centres visited in the review, where it was usual for costs, wherever in the organisation they occurred, to be recorded against projects. And the consultants engaged to propose a new costing system at TRRL commented that, 'detailed calculation of support costs and overheads is followed in most universities and centres of research when the private sector commissions research contracts from them'.

#### Too much bureaucracy

3.25 Establishments often seem over-burdened with checking and monitoring procedures. These are mostly financial and designed to protect the interest of the Permanent Head of the Department, as Accounting Officer, in safeguarding public money. Accounting Officers also have a strong interest in value for money. In that context, the effect of some of these procedures is at best doubtful and at worst positively harmful.

3.26 The detailed example below is drawn from MOD, not because the systems there are specially bureaucratic, but to show how the scrutiny technique can challenge the rules and assumptions which generate costs.

3.27 The Departmental report suggests that one or more of the following criticisms can be applied to a range of procedures in MOD's establishments.

#### "Those which fail to achieve the objective"

In MOD the project scientists usually have a cash allocation for equipment and external services. The scientists are the judges of technical need; but purchases have to be approved by administrators to check on the Accounting Officer's interest. Most requisitions are for small sums (95% less than £500 even at one of the biggest establishments) and are approved by junior staff. The process thus tends to be a routine and ineffective check, because if the scientists has not taken value for money seriously, the administrator's second guess is unlikely to be better.

#### "Those which fulfil one, but miss a more important, objective"

Stocktaking of inventory items was quoted, which deters misappropriation but fails to highlight the fact that the same items of equipment are being bought by different people.

#### "Those which duplicate work done elsewhere"

Some establishments kept duplicate Stock Record Cards. This meant that two entries had to be made for each stores transaction.

#### "Those which consume effort disproportionate to the risk they prevent"

Bill schedules and invoices prepared by clerical staff were sometimes checked at the EO, HEO and even SEO levels. In four establishments the costs of making and recording issues of stock and doing stocktaking doubled the purchase price of the stock.

#### "Sheer nannying"

Within Divisions "mail was booked in twice quite frequently". I would also regard the checking of requisitions as nannying.

3.28 Another important procedure challenged in the MOD study is Headquarters' requirements for cash flow information. MOD establishments report their spending to HQ in five Vote subheads: staff costs, staff related costs, stores, equipment, extramural research. The five subheads are split into some sixty sub-items. Establishment have to estimate and make a detailed quarterly report of spending, explaining variations against the sixty sub items. For long-term costings, a ten-year forward estimate is made on the same basis.

3.29 The report recommends that the quarterly returns of spending and the ten year forecast should be made on the five sub-heads rather than the sixty sub-items and that HQ should concentrate on controlling the establishments' total budgets rather than the five sub-heads. I very much agree.

3.30 The stores were also notable generators of paper. In most establishments items of very low value were treated as accountable, with associated form-filling and record keeping. In some establishments all items had to be recorded and balances kept even though in one case 90% of the stock items were worth less than £10. In several establishments the records were kept in duplicate.

3.31 Of the potential staff savings, about 350 arise from cutting unnecessary procedures and paperwork, mostly in stores.

#### Summing-up

3.32 To conclude this section I again quote the MOD report. And again not because the position in MOD is worse than anywhere else but because the passage gets to the root of many of the problems. This severe criticism was perfectly fair of the organisation concerned - the stores, where staff savings of 42% were recommended. It would not be at all fair to all the support services which the review has covered. But it is in some degree relevant to many of them. It offers an excellent summary of "what has gone wrong".

"The picture which fieldwork has revealed ... at establishments is of an organisation dominated by an adherence to procedures especially those concerning accounting ... A large number of different local procedures were found, many more elaborate than required ... These meticulous procedures co-existed with some inefficient practices ... and with considerable under-loading of both industrial and non-industrial personnel. Moreover the management information to judge cost-effectiveness ... was not available. In short the organisation is characterised by high and costly levels of service, safety first approaches and a lack of positive management."

3.33 I now turn to what needs to be done.

Continued over A

## SECTION 4 - WHAT NEEDS TO BE DONE

4.1 The immediate need is for each Department to pursue with vigour the recommendations for change in the report made by its examining officer. And to set about extending the investigation into areas of R&D support not so far covered. I cannot of course say that every one of over 400 recommendations is exactly right. But each report offers very useful scope for improvement.

Rec 1 I recommend that Ministers seek full Action Documents by the end of August and that annexed to each should be a programme showing how other areas of support in R&D establishments for which the Minister is responsible are to be organized along similar lines.

4.2 The research establishments vary greatly in size and scope. Some, as in MOD, are part of a much larger R&D effort funded by the Department. In most other Departments this is less so. This and other kinds of variation should be allowed for. But in my experience the attitudes and approach required for good management have much in common, whatever the circumstances of the organisation.

4.3 We must seek lasting changes which will deal with the underlying causes of the waste. I believe one of the most important problems is that the Directors of the establishments and their line managers, the people in the best position to minimise the costs, do not have a clear remit to do so. That is plainly beyond their own control. And so action by the establishments is not enough.

4.4 The essential pre-requisite for change is a clear statement of attitude from top management - action by the Minister and his Permanent Secretary to show in practical ways their will and determination to have good management. They should ensure that the establishments are working within the right management framework, giving each Director a clear statement of what is expected and the authority and accountability to go with it.

4.5 Line Management must then seek to ensure that the work reflects top management's priorities, costs are properly attributed to accountable managers and held to the essential minimum. The Centre can help by looking again at some current practices which do not seem to give Departments and establishments the assistance that they should.

### THE TASK FOR TOP MANAGEMENT

4.6 Ministers will naturally be most interested in the substance of their R&D programmes and in particular that:

- projects are relevant to their priorities
- technical and financial progress is being monitored
- costs are being held to the essential minimum
- the results represent good value for money and are being applied.

4.7 This review was about support services in R&D establishments not R&D programmes as a whole. Nevertheless the review offers some useful evidence on the wider issues. Costs were clearly not being held to the essential minimum in the establishments. Also most reports have criticised present methods of allocating costs to projects, which are the basis against which projects are approved and monitored. On occasion, examining officers pointed to specific weaknesses in control arrangements. For example, the Building Research Establishment does not make comprehensive estimates of the costs of research projects before they begin, nor assessments of their value when they are complete.

4.8 There is also the evidence from last year's scrutiny in D. Industry of arrangements for giving financial support to Research, Development and Technology. That showed that there was little evidence as to whether or not the Department's support (over £200m a year) had been effective and that, up until then, little attention had been given to finding out.

4.9 I do not think this is in any way a criticism of the Rothschild principle of "customer-contractor" as the basis on which Government research is organised. In my view that remains the essential foundation for achieving value for money. But I am left with the feeling that the management of R&D programmes generally - not just support services in establishments - may be capable of useful improvement. I cannot and do not wish to second-guess Ministers on how to organise their Departments to give effect to the customer-contractor principle. My concern is, first, with what is needed in terms of practical information and advice, for Ministers to take a view on behalf of the country as customer; and secondly to offer an outline against which Ministers can assess their current arrangements and, in some cases, the changes which are already in prospect.

4.10 In my view Ministers are entitled to know that their research programmes are assessed rigorously and to have drawn to their attention how well objectives are being met. This requires that an up-to-date picture of the R&D programme should be available for Ministerial review, showing for each major project or programme of research:

- when it started, the technical objectives and estimated cost at the time;
- technical and financial progress to date;
- the estimated spend to completion and the degree to which technical objectives are expected to be met;
- for projects completed since the last review, an account of how their duration, cost and achievement compared with what was estimated when they were approved;
- and how the results are being applied.

Chief Scientists are the natural co-ordinators for such a statement and the advice to Ministers and Permanent Secretaries on it. But it is essential that the views of the customer divisions whose work the programme supports are represented.

Rec 2 4.11 I do not know how effectively current arrangements conform to this pattern, as this issue was beyond the immediate scope of the departmental studies. But it should not be an onerous task for Ministers to seek the assurances they require. Hence I recommend that the Permanent Secretaries in each relevant Department should examine, in consultation with Chief Scientists as appropriate and against the outline above, the practical value of current arrangements for reporting to Ministers on technical and financial progress on R&D projects and the value for money obtained and report back to their Ministers by 31 December 1982.

4.12 Turning now to the research establishment, I believe it is vital to have clearly defined objectives which indicate the scope of activity it is expected to undertake. Senior officials in headquarters should not be constantly looking over the shoulder of the Director of an establishment. Yet Ministers are entitled to be assured that all the activities undertaken in the establishments are in line with their policies.

Rec 3 4.13 The evidence in this review of tendencies towards self-sufficiency, spreading out to use up accommodation available, and subsidising work because it is interesting, is worrying in this respect. It is for individual Ministers to decide how wide a net they want the establishments to cast. I counsel caution over taking on activities which are not essential to the Department. In my experience broadening out activities beyond the essential is often costly - and I would expect the risk to be greater in the public sector because of the difficulty of making commercial pressures apply. I recommend that with the appropriate Ministers' approval, Permanent Secretaries should give the Director of each establishment a "charter" which sets out the objectives and scope of his establishment for the foreseeable future (see also paragraph 4.15). It will of course be necessary to revise and amend individual charters from time to time in the light of changes in Government priorities for Research and Development.

Rec 4 4.14 I also recommend that one of the functions of the audit procedures of the department should be to watch out for any tendencies in the establishments to widen the scope of activities beyond the Minister's objectives.

4.15 The "charter" should also make clear how the Director is expected to go about the work. The establishments are natural cost centres but are not often treated as such. The 'free' provision of services to establishments, and within them lumping expensive support services into overheads, hide their cost from the very people who can control the demand - the project scientists. The practice of giving administrators delegated authority deriving from the Accounting Officer's interest detracts from the scientists' sense of responsibility. Moreover it makes for the notion that the Accounting Officer's interest is a matter for a few particular people. It should be the concern of all staff - particularly the line managers who in this case are the scientists.

4.16 The essential failure to compare value and cost has occurred because it does not seem important to do so. And present arrangements provide too few incentives to do so. Directors should be given authority and accountability for running their establishments in the most cost-effective manner.



Rec 5 I recommend that with the Minister's approval the Permanent Secretary (after advice from the Chief Scientist or Controller of Establishments) should include in each Director's "charter" a formal delegation of authority for running the establishment efficiently. Clearly each of these "charters" will be specific to an establishment. But I give an example in Annex 4 of the kind of thing I have in mind.

#### THE TASK FOR LINE MANAGEMENT

4.17 It would then be the Director's job to ensure that the scientific work of his establishment is properly approved and relevant to the Minister's needs, that the Minister's priorities are met at the required professional standard, and that productivity is improved and costs held to the essential.

Rec 6 4.18 I recommend that he should involve scientific line management in meeting all these requirements. In particular, he should seek to adopt commercial practice in "charging" all the costs of the establishment which fall on the Department's Votes (including accommodation when PSA repayment starts) to individual research projects on the basis of the services they actually consume. Research project managers should have budgets agreed by him and be responsible to him for the use they make of these budgets. (Annex 5 outlines one possible model).

4.19 The MOD examining officer suggested it was normal for the line manager to have in his direct control only 10% of his total costs. The aim should be to change that position radically. The effort required is part of a wider need to improve financial management and to push responsibilities down the line. I do not want to recommend new arrangements for R&D establishments which cut across these important efforts. But we must make rapid progress and I

Rec 7 recommend as follows:

- in Defence, Environment, Transport, Industry and Agriculture wider initiatives are under way to improve financial management. Each should treat the relevant establishments in this review as priority action - if necessary as experiments before wider decisions are taken. The relevant Action Documents should make provision for this.
- in the ODA establishments follow-up work will need to be mounted to put the necessary work in hand.

4.20 The Director may well want his Secretary or Head of Administration to take the lead on his behalf in ensuring that the need for cost-consciousness is as widely understood as possible, that advice and information are available to line managers, and the case for economy is made vigorously when decisions are being considered. But that is very different from requiring scientists to get every request for expenditure rubber-stamped. More selective scrutiny and audit would give both scientists and administrators a more responsible and rewarding job, be a more effective measure for ensuring value for money and save some administrative posts.

4.21 The Director should also have, within his total budget some freedom to trade-off between different types of expenditure - say between office machinery and travel or between buying and renting. He cannot have 'one bag of gold'. But Headquarters should aim to give him as much freedom as is needed to manage running costs efficiently.

Rec 8 4.22 I recommend that all Ministers with R&D establishments consider the suggestions in the MOD report that scientific staff should be responsible for their proposals and Secretariat staff should conduct, on the Directors' behalf, deeper investigations of value for money on a highly selective sample of cases; and that Headquarters should concentrate on controlling total budgets or major blocks within them, not the many small items.

#### THE TASK FOR THE CENTRE

4.23 I am keen that central departments should support the operational departments in improving the management of the establishments. There may be mistakes and teething troubles when the temptation will be to blame the parent department. There may be requests for special treatment which are inconvenient. But if we are to make progress I believe the centre should strive to encourage those who are experimenting and who have to continue to provide effective services meanwhile. I make recommendations in three specific areas: land and buildings, accounting conventions and selection and training criteria.

#### Land and buildings

4.24 The repayment system now being set up and the delegations that are part of it should lead to more realism in the case of land and accommodation when Departments have to pay for the accommodation they use. They will have more incentive to economise and rationalise. Departments will also be able to give line managers, including Directors of establishments, greater knowledge of and responsibility for works and maintenance costs. For a great range of minor jobs, costing less than £500, establishments will be able to arrange and pay for the work themselves. This is a sensible adjustment. It will give establishments substantially greater control of their accommodation affairs - and an idea of what it is like to take responsibility for getting this sort of work done. I doubt that it will lead to a universal desire to take on more.

Rec 9 4.25 The arrangements will, however, require that establishments clarify and co-ordinate their requirements and priorities. Whether or not the tasks are then carried out through the PSA I recommend that each establishment should designate a senior manager who will have responsibility for this clarification. He should also be charged with the continuing task of holding down accommodation costs and will provide a focus for contacts with major contractors and with the managers of the Government Estate.

4.26 Some establishments will undoubtedly feel that the changes in prospect will still not give them enough control over their accommodation. I believe that we should move with caution here. It would not be right, at this stage, to consider handing over this part of PSA's responsibilities to Departments. I do not want anything to get in the way of the vital moves to repayment and the planned delegations. The establishments' needs are, however, often highly specialised. There may be areas, beyond the planned delegations, in which establishments could

Rec 10 meet their own needs as well as can PSA. I recommend that PSA should seek to define with the establishments concerned those types of specialised building and maintenance work where the Director is likely to be best placed to specify and obtain what is required. For the other types of work, which PSA will continue to provide as part of its management of the Government Estate, I should like to see defined target levels of service agreed between the PSA and its clients.

#### **The Treasury**

4.27 The encouragement the Treasury can give is financial. I understand the reasons why the Chancellor wishes to keep as much discretion as he can in running the public expenditure survey. But Sir Douglas Wass has assured me that the Treasury does not as a rule prevent the partial redeployment of savings within the financial year or even seek to reduce a Department's planning totals for future years to take account of them where the savings are relatively small.

4.28 I strongly believe this is a modest incentive for Departments and line managers to find savings which should pay dividends. Managers should know with some certainty that when they offer up savings there will be some advantage to their budgets. The amount does not need to be large - it is the fact that it is there which matters.

Rec 11 I therefore recommend that the Chancellor of the Exchequer and Chief Secretary to the Treasury should consider with Departments how arrangements can be made to encourage Departments to re-invest more from savings achieved by greater efficiency, to further increase efficiency and effectiveness, reduce running costs, and improve staff motivation eg in accommodation, computerising administrative systems, other office machinery.

#### **The Management and Personnel Office**

4.29 The review of the Scientific Civil Service, carried out in 1980 by a working group under Dr Holdgate, called attention to the need for scientists' input to policy-making and the consequent need to develop 'technological generalists'. If my recommendations are accepted some scientists and other specialists in the R&D establishments will have their administrative and managerial responsibilities increased. We must encourage relevant skills.

4.30 There are implications for the recruitment and subsequent career management of scientists and other specialists. If administrative and managerial skills are in future to have greater emphasis in promotion decisions, the size and skills required of the career entry may need to be reconsidered. We shall need a satisfactory mix of those who can become managers and those who will wish to remain on research. This may mean greater use of short-term contracts, research fellowships etc to meet the continuing need for high quality research in establishments.

Rec 12 4.31 I recommend that MPO should by the end of this year examine the criteria currently used in the recruitment and training of scientists and other specialists to assess whether they adequately reflect the need for a robust mix of those with potential for management and high level administration and those who are out and out researchers. I understand that work is already in hand for scientists and this may provide a basis for the wider examination.

DEREK RAYNER

#### **LIST OF ANNEXES**

1. Summaries of Departmental reports.
2. Government spending on R&D.
3. Report of visits to private sector laboratories.
4. Draft charter for a Director of an Establishment.
5. Outline costing system for an Establishment.

## MINISTRY OF AGRICULTURE, FISHERIES AND FOOD

## ESTABLISHMENT: CENTRAL VETERINARY LABORATORY, WEYBRIDGE

Main Features: Total Cost 1981/2 £13.6m Manpower 804

Main site 33 acres, plus outlying farms, totalling approximately 580 acres.  
Outstations at Reading and Lasswade, near Edinburgh.

The Central Veterinary Laboratory supports Government policy on animal health through research, development and testing directed towards the diagnosis and control of animal diseases. The Laboratory's resources are applied about equally to R&D and statutory and service functions.

## SUPPORT SERVICES STUDY

Study Team: Dr M L Windsor	Cost £37.1K	Coverage :	Cost £7.4m
Mr D J Jones			Manpower 358
Mr B Puri		Savings :	Cost £1.2m (16%)
			Manpower 85 (24%)
			plus £3.9m capital

Main sources of recommended savings:

	<u>Cost</u>	<u>Manpower</u>
<u>Too many services in-house.</u> In-house production of animals and some biological projects were found to be very costly. Use of the private sector would be substantially cheaper and remove the need for 245 acres of land and new capital facilities. Cleaning and security services would also be cheaper if bought from the private sector.	£692K	71
		Plus £3.7m capital from new facilities no longer required and sale of land.
<u>Over-provision of services/too much bureaucracy.</u> Stores and Purchasing, Library and Messenger services were found to be over-provided. Checking was also unnecessarily detailed in the stores.	£106K pa	14
		Plus £200K from reducing stock holdings.

## Other findings

The team felt that the Laboratory's efficiency was impaired by lack of accountability and cost awareness. They recommended: a cost centre approach to make the Director responsible for all the resources; an improved management structure; a new costing system to enable support costs to be reflected in scientists' budgets; and regular reviews of the research work by MAFF customers.

**MINISTRY OF DEFENCE**

AEROPLANE AND ARMANENT EXPERIMENTAL ESTABLISHMENT, BOSCOMBE DOWN  
 ADMIRALTY MARINE TECHNOLOGY ESTABLISHMENT, TEDDINGTON  
 ADMIRALTY SURFACE WEAPONS ESTABLISHMENT, PORTSDOWN  
 ADMIRALTY UNDERWATER WEAPONS ESTABLISHMENT, PORTLAND  
 ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON  
 CHEMICAL DEFENCE ESTABLISHMENT, PORTON DOWN  
 MILITARY VEHICLES ENGINEERING ESTABLISHMENT, CHERTSEY  
 NATIONAL GAS TURBINE ESTABLISHMENT, PYESTOCK  
 PROPELLANTS EXPLOSIVES AND ROCKET MOTOR ESTABLISHMENT, WESTCOTT  
 ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH  
 ROYAL ARMAMENT RESEARCH & DEVELOPMENT ESTABLISHMENT, FORT HALSTEAD  
 ROYAL SIGNALS AND RADAR ESTABLISHMENT, MALVERN

Main Features: Total Cost 1981/82 £400m Manpower 25800

The establishments have between them over 22,000 acres of land. The main sites are listed above but most establishments have out-stations, of which there are 35 altogether.

2. The establishments form part of the Department's Procurement Executive, which aims to meet Service equipment needs in the most cost-effective manner. The equipment development and procurement programme costs about £5 bn a year. The establishments carry out innovative research underlying the initiating of Service requirements and support the development of new weapons systems and the modernisation and maintenance of existing ones. The range of their work is naturally very wide ranging from mathematics and chemistry to mechanical and electrical engineering and advanced electronics.

**SUPPORT SERVICES STUDIES**

3. At the time the review was being set up, a number of support services in MOD establishments had already been studied. MOD's contribution was therefore based on examining particular services rather than particular establishments. There were two main studies. Mr Miles' team with substantial help from Management Services experts in MOD and MPO, examined a range of domestic, administrative and specialised services. Mr Evans (also a member of the central team) examined workshops, a specialised area, in five establishments.

Study Team 1	Mr J R Miles	Cost £124.2K	Coverage :	Cost £48.85m
	Mr D Looman			Manpower 5214
			Savings :	Cost £6.7m (14%)
				Manpower 978 (19%)

Plus at least £1.5m capital.

Services studied and main sources of recommended savings:

Transport Cost £23.6K Coverage : Cost £9.35m  
Manpower 456  
Savings : Cost £850K (9%)  
Manpower 80 (18%)  
(Including 150 vehicles)

Scope for savings arises from over-provision of services and too many services in-house. Greater use of hired or owned self-drive cars in preference to paying Motor Mileage Allowance and maintaining in-house car services with drivers would be substantially cheaper. Some freight and parcels movements can also be contracted out.

Reprographics Cost £16.3K Coverage : Cost £1.6m  
Manpower 180  
Savings : Cost £120K (7%)  
Manpower 20 (11%)

Scope for savings arises mainly from over-provision of services. Most establishments have offset litho machines on which there is often spare capacity plus numbers of small dispersed copiers. Moving to large electrostatic copiers, better control of small copiers and work-sharing to make the best use of capacity would reduce costs.

Stores and Storekeeping Cost £31.6K Coverage : Cost £7.6m  
Manpower 1231  
Savings : Cost £3.2m (42%)  
Manpower 516 (42%)

Plus at least £1.5m capital from running down inventories

Scope for savings arises from over-provision of services and too much bureaucracy. Stores were frequently open and manned all day although only a small number of issues and receipts were made. Items of very low value were treated as fully accountable, which involves detailed recording and checking. The effort put into stocktaking

was found to be disproportionate to the value of the stock. The supervision of storemen, which involves both Stores Officers and Administration Group staff was considered excessive.

Messengers Cost £15.8K Coverage : Cost £1.3m  
Manpower 260  
Savings : Cost £490K (38%)  
Manpower 100 (38%)

Scope for savings arises from over-provision of services. For most parts of an R&D Establishment, 2 delivery/collection rounds a day is enough. One establishment already operates this system but others have 4, 5 or even 7. Changing to a basic pattern of 2 rounds, supplemented where necessary in large administration areas or for urgent work would reduce costs considerably.

Aircraft Servicing Cost £8.2K Coverage : Cost £11m  
Manpower 1300  
Savings : Cost £750K (7%)  
Manpower 110 (8%)

Scope for saving arises mainly from too many services in-house. Much of the work is highly specialised but costs could be reduced by commercial air-taxi services rather than the in-house passenger. Contracting out more routine servicing would make for better use of resources.

Secretaries' Departments Cost £30K Coverage : Cost £18m  
Manpower 1800  
Savings : Cost £1.3m (7%)  
Manpower 152 (8%)

Scope for savings arises mainly from over-provisions of services but also from too much bureaucracy. Some clerical staff working in direct support of scientists were doing routine and unrewarding work which was either not necessary at all or could be done better in the main administration areas. Other staff were involved

in checking on the value for money represented by scientists' proposals to buy in equipment etc. The check was considered ineffective in any case and to detract from the scientists' sense of responsibility for costs.

#### Other Recommendations

Mr Miles made a number of other recommendations aimed at increasing cost-awareness and accountability in the establishments generally, upgrading the managerial responsibilities of scientists and shifting the emphasis of administrators' work from detailed approving and checking to scrutiny and audit. The recommendations included moving towards financial control by scientific objective rather than inputs, through responsibility budgets for Directors. The detailed financial information currently supplied to Headquarters should be cut and better management information provided in the establishments. Secretaries of Establishments should have charters defining their responsibilities to the Director and Headquarters; and managers of support services should have terms of reference stressing their responsibilities for obtaining value for money.

Study Team 2	Mr C R Evans	Cost £28K	Coverage	:	Cost £8.15m
	Mr J F Russell				Manpower 790
			Savings	:	Cost £0.8m (10%)
					Manpower 120 (15%)
					Plus £1.25m capital

#### Workshops

Scope for savings arises from over-provision of services and too many services in-house. Foundries at RAE and ASWE should be closed and work transferred to AUWE releasing 28,000 square feet of workshop space. ASWE should be used for all gear cutting work in the South East and facilities at AUWE and RAE closed. Rationalisation of outstation workshops at AUWE will release 15,000 sq ft. Increased use of the private sector (especially to eliminate peaks and troughs in workload) is recommended for all Establishments. Workshops space recommended for disposal totalled 80,000 square feet.

#### Other Recommendations

The team recommended greater sharing of resources between establishments, close scrutiny of bids for new capital facilities and a reduction in the number of outstations. Fuller account should be taken of hiring and leasing when considering the purchase of mobile capital equipment and more use should be made of running contracts with individual firms in the private sector in order to facilitate the transfer of newly developed technology.

## DEPARTMENT OF THE ENVIRONMENT

## BUILDING RESEARCH ESTABLISHMENT, GARSTON

Main Features : Total Cost 1981/82 : £15.8m Manpower : 942  
 Main Site near Watford, 70 acres. Outstations at  
 Princes Risborough, Borehamwood, Cardington and  
 East Kilbride

The Building Research Establishment support Government policy and statutory responsibilities by carrying out research and development in building and construction, housing and planning, prevention and control of fire and environmental functions.

## SUPPORT SERVICES STUDY

Study Team : Mr P Harris Cost of Study £32.5K Coverage : Cost £6.8m  
 Mr P B Bailey Manpower 540

Savings : Cost £1.7m (25%)  
 Manpower 116 (21%)

Main sources of recommended savings:

	<u>Cost</u>	<u>Manpower</u>
<u>Unrealistic Charges.</u> The establishment currently provides a range of advice and publications without charge. Rationalising the service and introducing charges would bring a considerable financial saving	£510K	5
<u>Waste of Land and Buildings.</u> Sufficient space exists on the main site to accommodate the research work at Princes Risborough. Disposing of the outstations site would reduce running costs and release 26 acres of land and over 100,000 square feet of buildings.	£343K pa	18
<u>Too many services in-house.</u> Cleaning, security services, medium and large scale engineering work can be contracted out at less cost.	£364K	64

Over-provision of services. Scope exists for centralising and reducing Typing, Personnel, Finance, Stores and Library Services.

£250K pa 25

Other Recommendations

The team felt that the establishment's costing system gave an inadequate picture of the cost of projects, particularly the support costs. They proposed a new costing system, a project engineering section to provide experimental facilities and a new management structure for support services. They were also doubtful whether some particular projects were really essential Government tasks and suspected overlap between the research programmes of BRE and TRRL and recommended a review of the scope for rationalisation.

DEPARTMENT OF INDUSTRY

ESTABLISHMENTS: THE NATIONAL PHYSICAL LABORATORY, TEDDINGTON,

WARREN SPRING LABORATORY, STEVENAGE

Main features: Total Cost 1981/82: NPL £17.2m WSL £5.2m  
Manpower NPL 928 WSL 313

NPL occupies 70 buildings on a 62 acre site at Teddington. WSL occupies a 15 acre site on an industrial estate in Stevenage.

NPL is the national standards laboratory of the UK, and develops and maintains measurement standards which serve as the ultimate reference for industry, commerce and legislation. It also pursues research into materials science, applied mathematics and computer science. WSL conducts research into atmospheric and marine pollution, mineral and metal extraction and waste material recovery.

SUPPORT SERVICES STUDY

Examining Officer: Dr M A Darnbrough

Cost of Study £20.0K Coverage: Cost £15.5m  
Manpower 578

Savings: Cost £1.4m (9%)  
Manpower 90 (16%)

Main sources of recommended savings:

	<u>Cost</u>	<u>Manpower</u>
<u>Waste of Land and Buildings</u>		
There is a substantial scope for rationalising and reducing accommodation at NPL. Over a period it should be possible to dispose of some 200,000 square feet of buildings.	£635K	0



Over-provision of services/Too much bureaucracy

At NPL, messenger, and telephone services were found to be over-provided, stock levels were unnecessarily high and inventories inefficient. The accounting system can be streamlined through use of NPL computer. At WSL typing and messenger facilities were over-provided.	£554K	46
--	-------	----

Too many services in-house

NPL and WSL could contract out all cleaning. NPL should contract out more work currently undertaken by workshops and WSL certain chemical analysis and engineering services.	£192K	44
--	-------	----

Other recommendations: The examining officer recommended that further studies should be undertaken to consider the scope for contracting out security and workshop services at NPL and that Directors should have more discretion as to whether to purchase items such as reprographic machines and vehicles through Government Departments or local companies. She also felt that research programmes carried out for Requirements Boards should have more detailed objectives and should include target dates for some aspects of work in order to facilitate evaluation.

**OVERSEAS DEVELOPMENT ADMINISTRATION****ESTABLISHMENTS: THE TROPICAL PRODUCTS INSTITUTE, LONDON  
THE CENTRE FOR OVERSEAS PEST RESEARCH, LONDON**

Main Features:	Total Cost 1981/2 : TPI £5.6m COPR £2.6m Manpower TPI 290 COPR 127
----------------	---

The main sites for both units are in Central London. They also have between them 8 outstations, the largest of which are at Slough, Culham, Oxfordshire and Porton Down, Wiltshire.

The units support ODA's policy of giving technical assistance to developing countries by providing research, training information and advice on the technical problems arising subsequent to harvest and pest problems relating to agriculture and public health.

**SUPPORT SERVICES STUDY**

Study Team:	Mr J A Anning Mr J H S Chard	Cost of Study £16.6K	Coverage	: Cost £5.5m Manpower 228	
			Savings	: Cost £475K (9%) Manpower 23 (10%)	

Main source of recommended savings:

Over-provision of services

Workshop, Messenger, Information and Publicity and certain administrative services were all found to be over-provided.

Other recommendations

The team felt that the costing systems in both units were inadequate if Headquarters was to judge the value of competing claims on aid funds. They proposed a new project costing system, and a cost-centre approach with project leaders taking more delegated responsibility for the control projects. During the course of this study the Minister and Sir Derek Rayner agreed on the need to compare the costs of scientific work at the units with those of outside organisations. That work is now going on.

## DEPARTMENT OF TRANSPORT

ESTABLISHMENT: TRANSPORT AND ROAD RESEARCH LABORATORY,  
CROWTHORNE

Main Features: Total Cost 1981/2 £17.8m Manpower 797

Main site 250 acres plus an outstation at Livingstone, West Lothian and storage facilities at Culham, Oxfordshire.

The Laboratory supports Government policy towards roads and transport, including their interaction with urban and regional planning, mainly by conducting research and related activities in highway engineering, traffic engineering and safety and more general transport subjects.

## SUPPORT SERVICES STUDY

Study Team:	Mr P Harris	Cost £32.5K	Coverage :	Cost £6.97m
	Mr P B Bailey			Manpower 407
			Savings :	Cost £1.74m (25%)
				Manpower 106 (26%)

Main sources of recommended savings	<u>Cost</u>	<u>Man power</u>
<u>Waste of Land and Buildings.</u> By reorganising accommodation on the main site a whole building of 62,000 sq ft can be given up. Some 32,000 sq ft of storage space can also be given up.	£500K	
<u>Too many services in-house.</u> Publications work, longer-term engineering jobs on the workshops and security services can all be contracted out at less cost.	£410K	66

Over-provision of services/too much bureaucracy. Computer, Photographic, Messenger and Gardening services were found to be over-provided. Stores, Finance and Accommodation services can be stream-lined.

£500K

30

Other recommendations

The team felt that the Laboratory's costing system gave an inadequate picture of the costs of projects, particularly the support costs. They proposed a new system, and changes in the management system for support services. They also suspected overlap between the research programmes of TRRL and BRE and recommended a review of the scope for rationalisation.

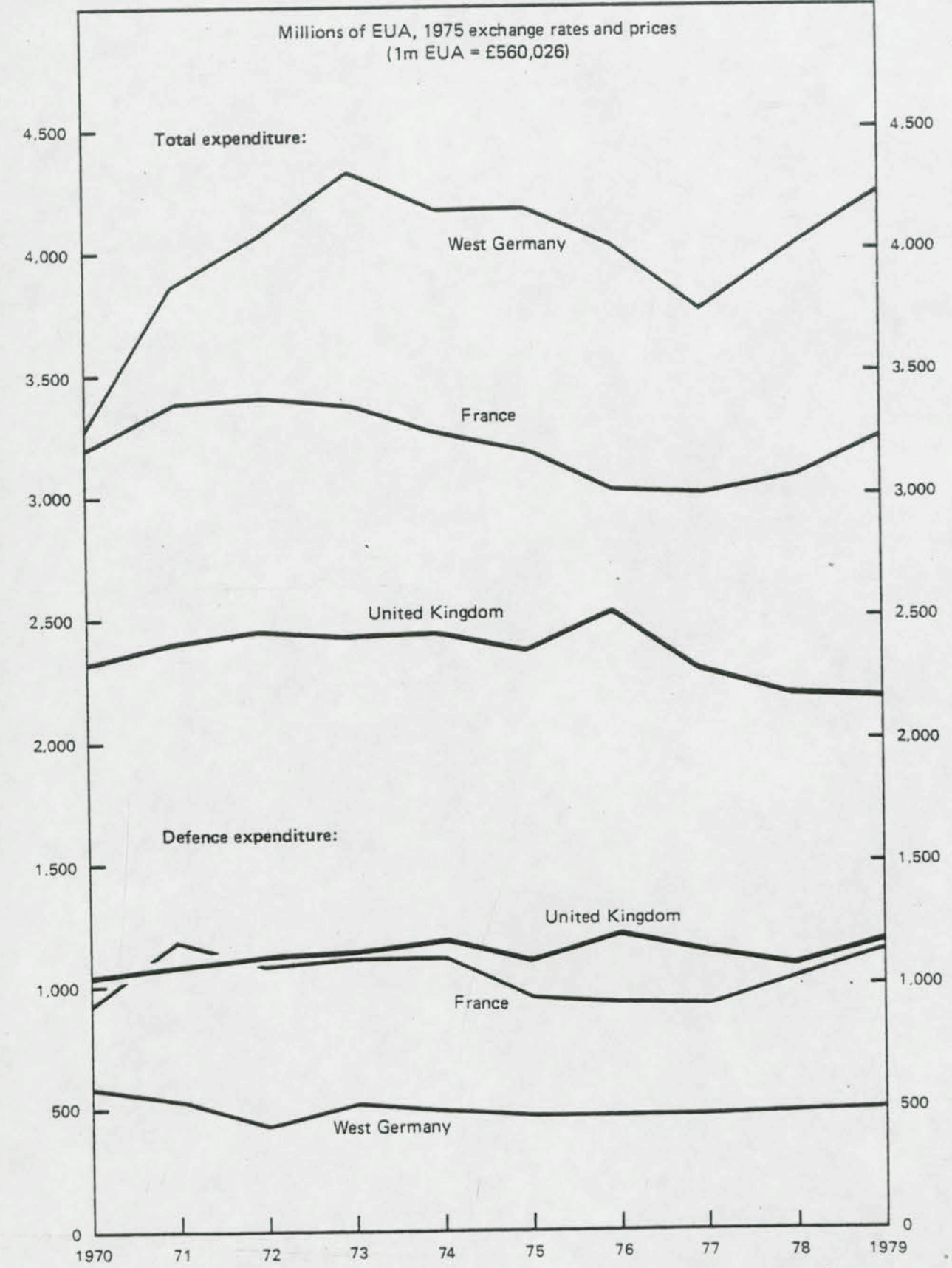
GOVERNMENT RESEARCH AND DEVELOPMENT EXPENDITURE

£'000

Departmental Analysis	1980-81	1981-82
	Total Provision	Supply Estimates (at outturn prices)
Agriculture, Fisheries and Food, Ministry of	62,053	83,133
Agriculture and Fisheries for Scotland, Department of	22,778	29,118
Civil Service Department	118	108
Customs and Excise	40	50
Defence, Ministry of	1,493,446	1,683,621
Education and Science, Department of	622,893	787,933
Employment, Department of	8,874	9,418
Energy, Department of	201,163	234,445
Environment, Department of the	46,514	46,692
Foreign and Commonwealth Office	79	85
Forestry Commission	2,589	3,164
Health and Social Security, Department of	26,030	32,330
Home Office	9,067	9,904
Industry, Department of	231,056	304,631
Office of Population Censuses and Surveys	1,961	1,521
Ordnance Survey	589	458
Overseas Development Administration	25,385	23,656
Property Services Agency	10,052	9,515
Public Record Office	21	215
Scottish Development Department	388	387
Scottish Economic Planning Department	47	56
Scottish Education Department	1,223	1,517
Scottish Home and Health Department	3,111	4,844
Scottish Office	3,545	3,882
Trade, Department of	4,123	5,652
Transport, Department of	22,221	24,583
Treasury and Subordinate Departments	452	395
Welsh Office	1,579	1,538
<b>TOTAL</b>	<b>2,801,397</b>	<b>3,302,851</b>

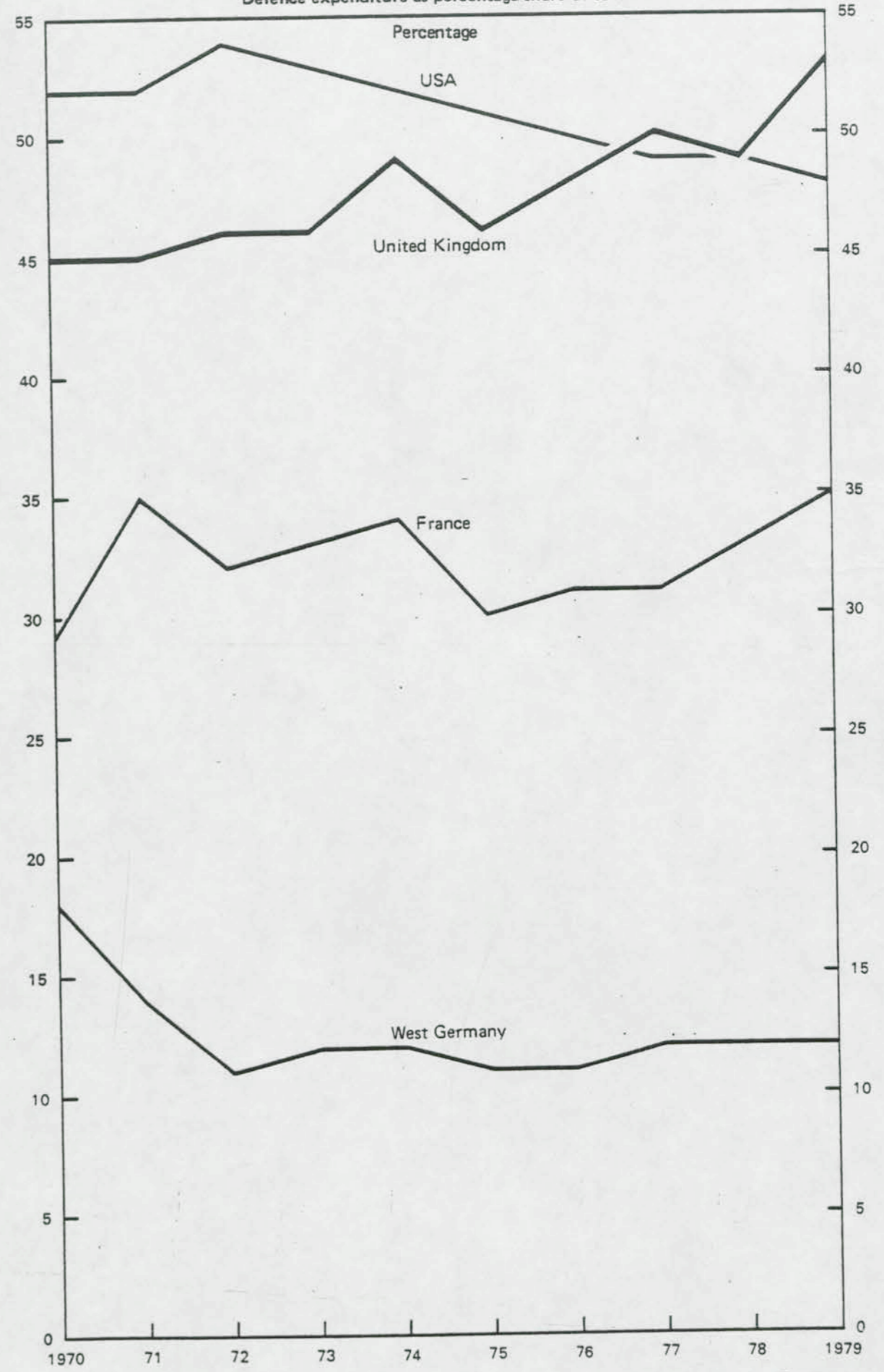
Source: HM Treasury Estimates Clerk Branch

Government expenditure on research and development:  
total and defence



Source: Eurostat

Government funded research and development  
Defence expenditure as percentage share of total



Source: Eurostat

**RESEARCH AND DEVELOPMENT IN THREE PRIVATE SECTOR COMPANIES**

During the course of the review, through the good offices of the CBI, Mr Andrew Stott of the Central Team led examining officers on visits to three private sector R&D companies who between them employed over 600 staff and had a turnover of over £12m pa. Their most striking feature, especially when compared to the Government establishments covered by the review, was cost-consciousness. They needed to respond rapidly to likely changes in the costs and benefits of research projects.

**Allocating Support Costs**

2. The establishments were organised into "profit" or "budget" centres with set rates of return. Most support costs incurred by research or development projects were allocated directly to them. Workshops, photographic units, typists etc recorded their time against the projects on which they worked. Those support services for which this was impractical (such as personnel) were grouped into distinct cost centres.

**Management Information on Support Costs**

3. In order to control costs closely the firms had developed recording systems. Staff completed a weekly timesheet indicating the time spent on each project and on non-chargeable or overhead activity, to the nearest half hour. Direct costs such as equipment and printing were similarly allocated. Thus wherever it occurred in the organisation, expenditure was recorded against projects.

4. The systems were used not only to provide project managers with tallies of expenditure, but also as management tools. A typical management report included:

1. the starting and finishing dates, budget, total spending and, if any, potential overspending on each project;
2. the cash flow for each project and profit centre;
3. the actual and expected gross profit;
4. the actual expenditure under various budget headings;
5. staff productivity (ie the amount of time devoted to chargeable work and to overhead activity). Exceptional figures or trends were identified for senior management.

This system covered over 200 staff and required 1½ people to operate.

## The Use of Management Information

5. Information was disseminated rapidly. In one case each project manager had on his desk by Wednesday morning the collated information for the previous week. It was stressed that the timesheet would not work unless people knew that it was used. This was ensured by submitting timesheets to line managers, by thorough checks on data consistency and by fast feedback on results to managers and those they managed.
6. This information was used at three levels. First senior management used it on a monthly basis to make allocation of available funds between projects. This was of particular importance as budgets could vary with the financial performance of the firm. The Board could decide between projects, balancing likely costs and revenue.
7. Secondly, on a weekly basis project managers used the information for the efficient allocation of their budgets. Scientific effort was nominally divided into teams; in practice spare resources under one line manager could easily be redeployed - even on an hour to hour basis - to assist the work of others.
8. Thirdly, managers of support services were similarly able to assess their productivity. In most cases support services were expected to achieve their own set rate of return.
9. The "cost centre" approach not only provided the information for efficient management but also created the incentive. For example, if the return in a centre exceeded the target then its manager had first call on the surplus, say, to finance the purchase of extra equipment. Financial performance was also a significant factor in setting individuals' pay.

## Contracting Out

10. Because of the incentive to minimise overheads there was a strong tendency to 'contract out' for support. As one manager put it, "Remember what business you are in - contract out even if it appears more expensive". Managers of support services had discretion to contract out where they considered it appropriate. In one firm where the workshop managers had full discretion to "make or buy", about half the work was sent to local firms, which competed keenly for business. Work requiring specialised techniques was invariably set out because the firm did not maintain the necessary skills. None of the firms had fixed rules. Decisions were delegated to the level where there was the knowledge and incentive to obtain the most economical option.
11. Similar practices applied to equipment. The decision to acquire capital equipment was based on projected earnings over its life-time. At one establishment the proposal to buy would show the expected number of hours use, and projects would be charged by the hour for their use of the equipment. Larger capital equipment was often leased. If equipment was too highly specialised to be worth buying, arrangements were made to buy time on equipment elsewhere.

## The Careers of Scientists

12. There were a number of differences between the career development of Scientists in these firms and in Government.
13. There was a natural development from research to management. In one firm, which was part of a larger group, only the first 5 years of the Science Graduate's career would be mainly concerned with science. He would spend at least 2 years in production plant and would not necessarily work in central research. All but the newest researcher thus had experience of production problems and pressures. At the end of about 5 years those with management potential would move out of research into production management or marketing. Those without management potential would not expect to progress any further except for (literally) one or two outstandingly talented experts in key fields of the firms activities, who might become semi-independent Consultants to the group.
14. In another firm, which was dependent solely on contract work, about half the recruits would leave within 2 or 3 years because they did not like (or achieve) either the requirement for their individual work to show profits or the need to be flexible and gain new skills to meet changes in the market. Of those who stayed, only the exceptionally able would expect promotion for scientific rather than managerial talent.

## SPECIMEN CHARTER FOR DIRECTORS OF R&amp;D ESTABLISHMENTS

## MINUTE FROM THE PERMANENT SECRETARY

These instructions are given to you on your appointment as Director of the [                      ]. The objectives of the Establishment are...

2. You are personally accountable for all the work undertaken by the Establishment. Only research essential to the Department's needs should be carried out. You must ensure that it is executed to appropriate professional standards, and with full regard to financial propriety, economy and efficiency.
3. The programme of work should be agreed annually with me [and will be subject to approval by the Minister]. Once the programme is approved, new projects should not be taken on without authority from me [or Chief Scientist/Controller R&D].
4. Any work which you propose to take on for other Government Departments, public bodies or private industry should be clearly identified in your proposed programme with the reasons for considering it essential to the Department's interests. If approval is given for such work you will be accountable for ensuring that charges are raised on the customers which reflect the full costs. Similarly, you should not give more than limited technical advice and information or distribute scientific reports extensively outside the Department without raising charges which reflect full costs.
5. As Accounting Officer I have responsibility for the financial well-being of the Department. [These responsibilities are set out in the attached note.] I delegate the associated authority [through Chief Scientist/Controller] to you in respect of your Establishment. You are thus personally accountable for ensuring that the Establishment's work is carried out within cash limits and with due regard to the need for economy, efficiency and the avoidance of waste.
6. The Establishment Secretary/Administrative officer and his staff have training and experience with which they can assist you in discharging these responsibilities. You should consult them on all matters touching the Accounting Officer responsibilities. But whether or not you accept their advice the responsibility for decisions is yours.
7. You are accountable for encouraging cost-consciousness in all your staff. The importance of securing value for money should be understood by all as part of day-to-day management. You should aim to delegate authority as far down the line management chain as is consistent with the capabilities of individual staff members. Such delegations should be made so that those concerned are clearly accountable to you. The role of the Secretary/Administrative officer in explaining and advising on financial matters should not detract from the responsibilities of line managers.



8. You are required to contribute to the annual review of the Department's R&D programme which is made for the Minister [by the Chief Scientist/Controller]. When submitting your programme for approval you should show when each project started, the technical and financial objectives at the time; technical and financial progress to date; the estimated spend to completion and the degree to which technical objectives are expected to be met. For projects completed during the year you should give an account of how their duration, cost and achievement compared with what was estimated when they were approved and how the results are being applied.

9. [At the same time] you should make an annual report [through the Chief Scientist/Controller] to me of the improvements in the establishments' efficiency and effectiveness which have been made during the year.

DEPARTMENT OF TRANSPORT  
TRANSPORT AND ROAD RESEARCH LABORATORY

COSTING OF SUPPORT SERVICES

DATED: 30 NOVEMBER 1981

DEPARTMENT OF THE ENVIRONMENT  
TRANSPORT AND ROAD RESEARCH LABORATORY

COSTING OF SUPPORT SERVICES

Contents

	<u>Page</u>
1. INTRODUCTION	
1.1 Background to the assignment	1
1.2 PMM approach	1
	2
2. PRINCIPLES AND FEATURES OF COSTING AND CHARGING SYSTEMS	3
2.1 Objectives	3
2.2 Choice of cost centre	3
2.3 Definition of services	4
2.4 Level of detail	5
2.5 Support services for other than research projects	6
2.6 Inclusion of all cost implications	6
2.7 Incentives	7
3. SYSTEMS IN THE TRANSPORT AND ROAD RESEARCH LABORATORY	8
3.1 Present Position	8
3.2 Some problems and difficulties	10
3.3 Proposed new systems	11
3.4 Implementation	18
4. CONCLUSIONS	20

**APPENDICES**

I LIST OF PERSONS SEEN

II BREAKDOWN OF TRRL EXPENDITURE (BASED ON 1980 OUTTURN)

## 1. INTRODUCTION

### 1.1 Background to the assignment

Following receipt of the Department's invitation letter dated 28 September 1981, on 5 October 1981, Peat, Marwick, Mitchell & Co (PMM) were commissioned to undertake a study in support of the Rayner Review of Support Services in the Transport and Road Research Laboratory (TRRL) and the Building Research Establishment (BRE).

Our role was defined by Mr Peter Harris, the Study Officer, as being to assist in the specification of the basic features of a research programme management and costing system for both establishments. In June and August 1981 Mr Harris had produced Synopses of Findings for the BRE and TRRL respectively. These had been discussed in confidence with senior staff of each establishment, and broad agreement in principle had been obtained to most of their outline recommendations. The main proposal relevant to PMM's work was that the costs of in-house support services should be allocated to individual research programmes in order to encourage cost-consciousness on the part of individual research managers.

PMM were asked to specify the basic features of a system for charging out all costs to research programme managers and deal with the following aspects:

- a general description of the main features of the system,
- the principles for choosing the cost centres,
- the treatment of services within the system (do they have budgets? How should costs be attributed?),
- the annual cycle of events for research programme managers and how this relates to existing financial and programme formulation procedures,
- the level of detail required within the system to ensure the objectives of cost consciousness and management control are achieved without incurring excessive costs in the system itself,
- the management skills and techniques that are required to make such systems effective,
- the computer needs of the system.

### 1.2 PMM approach

Our work was undertaken by Mr Jon Fielden, a senior manager, and Mr Maurice Stafford, a senior consultant, who visited the TRRL and the Garston site of the BRE in the period 5 to 16 October 1981.

Unfortunately, in the very limited time available it was not possible to visit the Fire Research Station and the Princes Risborough Laboratory of the BRE, nor the Scottish establishments of either TRRL or BRE. At the establishments visited we spoke to both Directors and a wide range of staff from the supporting services and the administration. In addition we interviewed two heads of research departments to learn their views about the relevance of charging and costing systems. A list of the persons interviewed is given in Appendix I.

Our aim was to establish what was present practice in accounting and management information systems and to what extent it was possible and desirable to reallocate the costs of the support services to research projects and other cost centres. As part of this review we gave preliminary consideration to what would be the most rational and appropriate unit of charge for each support service and any difficulties which might arise in practice in the recording and use of such units.

## 2. PRINCIPLES AND FEATURES OF COSTING AND CHARGING SYSTEMS

### 2.1 Objectives

The basic objective of any costing system should be to collect and classify costs in such a way that the costs of specific activities can be ascertained with a reasonable degree of accuracy. From the charging point of view, cost information will assist in the determination of a pricing policy by setting a floor to the levels of charge which will not be breached except by a deliberate decision taken in the knowledge of the financial implications for the enterprise. In the present context cost information will of course provide the basis for the internal pricing of the use of support services, since it is not suggested that any profit or loss should be aimed at in charging out these services.

One consequence of an effective costing system is that managers of cost or responsibility centres are given useful up-to-date information with which they can manage their activities. This encourages them to take initiatives in order to control events to meet their budget. Thus, costing systems are an important aid to positive management.

### 2.2 Choice of cost centre

A cost centre is a unit of activity within an organisation for which a specific manager has budget responsibility and is able to influence the level of costs and/or income. Within BRE and TRRL the cost centres which clearly define themselves are organisational units such as departments and divisions under the control of the heads of those departments and divisions. Operating and administrative expenses would be allocated to cost centres. Expenditure on research projects, both intra-mural and extra-mural, would be allocated to individual project codes, using system of project costing. These, together with the obligatory vote accounting, appear to form a three-dimensional matrix of financial information particularly suitable for computer treatment.

Support services fall into the second of the classifications defined above. In order to ascertain the true costs of research, charges should be made for the services provided so that, at the budget level of activity, charges out equal budgeted cost, producing a nil balance. The

research departments would be similarly treated so that the managers of research departments would be presented not only with the progress and costs of projects but also with the performance against plan of their departments as a whole.

Where full costing is introduced by government policy into support services, there is usually a corollary that users are free to choose alternative sources for each category of support service. This ensures that the managers of each support service are responsive to the demands of their customers and are forced to maintain services and prices which are competitive with the private sector.

### 2.3 Definition of services

Within the general definition above, it becomes necessary to consider precisely which organisational units should be treated as cost centres. Because of the specialised nature of their activities it is essential to define certain support activities, such as computers and photography, as distinct cost centres. It follows, therefore, that these must have their own budget allocation and that the manager concerned must have responsibility for that budget.

Generally the support services are those which provide specific services to research projects. The size and capability of these services should correspond with the demands being made on them by the research programme; this should not be judged from a short term perspective but serious fluctuations in activity must be examined to determine whether they are the result of temporary factors or derive from a longer term trend. Similarly, trends in costs of units of service should be closely monitored and, where appropriate, compared with prices available from outside suppliers of similar services.

The research projects should also be costed individually and provision should be made for the aggregation of project costs by Programme Item Forms, subject areas and other appropriate groupings. Research projects should also be identified to the organisational unit responsible for their control so that the performance of particular units in project management may be evaluated.

There is a core of administrative services whose activities cannot readily be identified to particular research projects and which must therefore be treated as an overhead. These cost centres include, for example, the directorate, the finance and accounts functions and personnel and publicity functions.

In all cases the financial performance of the relevant manager must be measured against budgets which have been previously agreed between these managers and their superiors, and which cover items within the manager's ability to influence.

### 2.4 Level of detail

As a general consideration it is wasteful of resources to cost very small units unless those units are significant to the overall performance of the establishment. This has implications in the following main areas:

- the choice of cost centres and how far to pursue the subdivision of cost centres,

- the selection of units of measurement, for example time; here the fineness of the time unit must depend on the circumstances of each area being costed, but in general it would appear that in the support units it will be necessary to use a minimum unit of half an hour and there seems no reason why this should not apply to all time recording,

- whether or not to charge out and therefore record separately every item of material used in, for example, photography.

In applying this principle it is evident that a balance must be struck between results which, on the one hand, might be so broad-brush as to be misleading and, on the other, are so detailed that substantial additional staff effort is required, perhaps coupled with delay which renders the reports too late to be of maximum utility.

#### 2.5 Support services for other than research projects

In order to get a complete picture it is necessary to make charges for support services not only to research projects but to all other areas to which services have been supplied. Thus, the preparation of an annual report or of a special exhibition may involve much work from, say, illustrators and photographers which should be charged to the appropriate administrative cost centre. This ensures that the sometimes substantial use of resources for such purposes is not overlooked as well as enabling the support services to recover their costs fully.

#### 2.6 Inclusion of all cost implications

In order to arrive at a full cost to charge to a research or other project, it is necessary to take into account items which are substantial but which are not normally dealt with in government accounting systems. The major items are the costs of using capital assets such as land and buildings, computers and other major plant items. These charges do not appear in vote accounts except for the capital costs of equipment when purchased. Land and buildings, however, appear as acquisitions and disposals only in the PSA votes and no charge is made to the occupiers for the cost of occupation except for certain incidentals. However, in order to approximate to the true costs of research projects, it is necessary to take account of the accommodation costs and the other costs of consuming capital items.

#### 2.7 Incentives

Any costing system, which must of necessity involve time and effort in the analysis and production of data, should operate in a managerial environment where the cost centre manager has an incentive to make changes. If it does not, he may consider the effort to have been wasted. The costing system must therefore aim to meet his specific local management information needs, as well as serving any Departmental or Environment central requirements.

In our view, the effectiveness of a manager in financial management terms should also be taken into account in the normal assessment of his performance and suitability for promotion. An effective costing system is an essential tool to provide the information on which such judgements can be based.

### 3. SYSTEMS IN THE TRANSPORT AND ROAD RESEARCH LABORATORY

#### 3.1 Present position

Vote accounts at TRRL are maintained on a manual system according to heads of account supplied from Hemel Hempstead.

A memorandum project costing system (MICS) is run on the ICL System 4-70 computer taking input from summaries of cash expenditure and from timesheets. The timesheets are submitted by research staff only. Until early 1981 timesheets were also completed by support services staff. Timesheets are completed using a minimum time unit of half a day.

For calculating the cost of the time devoted to research the staff are costed at the rates given in the CSD ready reckoner for staff costs with a percentage added for overheads. At present this percentage does not cover the full costs of the laboratory, but it is proposed to use an overhead on cost of 254% retrospectively from 1 April 1981. This percentage is intended to cover the full costs of the laboratory, including support services, the common services charge from the Department of the Environment and an element for accommodation and has already been used for calculating charges for repayment work. The calculation of this overhead charge is shown at Appendix II.

The present system also produces departmental statements of cash costs against allocations. Unfortunately the usefulness of these has been reduced because departmental allocations are no longer made and there is consequently no element of comparison against plan.

Senior management is aware of the shortcomings of the present project costing system and seems willing to revert to time recording for all staff. This is in any case still continuing on a semi-official basis in the Technical Services Unit to produce a time analysis, although shortage of clerical resources has apparently not yet allowed this system to get up to date. The present systems are, however, clearly defective in the methods of allocation of cost in that:

- support services are not costed direct to research projects,
- no account is taken for internal costing purposes of allied service costs,
- although cash costs are generated by division, no allocation exists against which to measure these,
- generally, management is not made aware of the real costs of the services they are consuming, and this is true also of internal customers within the Department of Transport,
- project managers are not aware of the support service costs they are incurring and there is no measure of the level of activity in the support services except the unofficial one mentioned above.

The MICS is run on the ICL System 4-70 computer which is due to be taken out of service in December 1981. Some of the programs are written in low level language (assembler) and so cannot be transferred to another machine. The existing computer system is therefore currently being reworked so that it can be transferred to the new CDL Cyber mainframe. It is intended that the data held should be available for interrogation not only by TRRL staff but by the Transport Scientific Policy Unit (TSPU) based in London who will have a terminal for this purpose. The systems analysis and programming are being undertaken by TRRL computer division staff, since no such resources exist in the finance and administrative areas; this is a service which is not normally provided to users, since most research staff develop their own applications and look to computer staff only for advice.

### 3.2 Some problems and difficulties

An unusual feature which affects TRRL is that its activities are funded from two parliamentary votes which are administered by two separate central finance divisions at ministry level. Salaries, wages, general administrative expenses and common services are part of the Department of Transport's central and miscellaneous services vote. Capital expenditure, 'minor items' and extra-mural costs, together with appropriations in aid, all appear under the research heading of the Department of Transport's transport services vote.

As far as the Department of Transport is concerned, this is a misleading misclassification of the laboratory's expenditure since, if no research were to be carried out, the whole of this expenditure could be dispensed with, not just that in the transport services vote. The result is that the research vote understates the cost of research. It is further distorted by the fact that the appropriations in aid deducted from it (mainly from ODA) are in fact calculated to cover the 'administrative' costs which reside in the Department of Transport's central and miscellaneous services vote. It seems more helpful for the whole of the costs of TRRL to be in the research vote.

Another problem relates to management support for the provision of reliable cost information; it is of no advantage to provide better management tools if management is not willing to use them to good effect. There is some evidence that senior management recognises this, but it is also clear that an education process is needed within the organisation generally. Against this, the recent discontinuance of timesheets except for research staff and the fact that departmental allocations are no longer made cast some doubt on the commitment to improved cost control systems. The need for management support will be particularly crucial, if in the short term, the development of financial information and control systems were to require extra resources at a cost to resources allocated to research effort.

### 3.3 Proposed new systems

#### 3.3.1 General structure

It is proposed that the support services should be treated as individual cost centres and that they should be charged out on suitable bases to the research projects to which they contribute to any other cost centres for which they work. The research departments should also be

treated as cost centres and their full cost should be charged out to research projects. In assessing the costs of departments for this purpose, account should be taken of the capital assets which are being used, for example accommodation, computers, machine tools, etc.

This approach omits the Department of Environment central administrative costs and the common services charge for central departments of the ministry. It is proposed that these should be included by making an allocation to the total costs of the organisational cost centres. In this way central administrative costs will be included in project costs as part of the charges for research and support services.

Our recommendations would produce a basic report for projects on the lines of that shown in Figure 1 overleaf. A report on a project would include all these costs, together with the starting and finishing dates, and (probably manually entered) an up-to-date estimate of percentage completion and time and cost needed to complete together with the estimated completion date.

FIGURE 1

#### BASIC PROJECT REPORT

	Year to date		Total cost	
	Estimate	Actual	Estimate	Actual
Research staff hours				
		£	£	£
Research time				
Support services:				
Civil engineering				
E.E. Engineering				
Workshops				
Photography				
Computer				
Direct costs				
Capital				
Minor items				
Travel and subsistence				
Outside research				
<b>TOTAL COST</b>				

Some of the items (e.g. capital equipment) might need individual description, but the outline described should provide the basis of a document against which to review the progress of a project, both for the project manager himself and the person to whom he is responsible.

The organisational units which are identified as cost centres would then be the subject of reports which would identify the direct costs attributable to the cost centre and show as a final deduction the amounts charged to projects or to other cost centres on the lines of the specimen shown at Figure 2. The budgeted balance would normally be nil and queries as to corrective action required would be raised if either the actual final balance were not near nil or there was a substantial variance from budget in expenditure or recharges. In the case of administrative cost centres, where charging out cannot readily be related to work performed, the comparison against budget would be the main test.

### 3.3.2 Allied service costs

The point has been made above that charges for all resources used should be included in the individual cost centres and this may pose some difficulties in arriving at suitable figures. As far as land and buildings are concerned, the best figures to use are market rental and it is suggested these should be obtained from PSA. To rental must be added contributions in lieu of general rates, water charges, costs of fuel, cleaning etc., and the direct administration (caretaking, security, etc) in order to arrive at the total cost of the resources at TRRL's disposal. This implies that a separate cost centre should be set up for this purpose. From this cost centre, each department should be charged on the basis of the space occupied and the balance should be charged to a vacant accommodation cost head in the general administrative area.

FIGURE 2

#### SPECIMEN ORGANISATIONAL COST CENTRE REPORT

Cost centre: .....	This month		Year to date	
	Budget	Actual	Budget	Actual
<u>Expenditure</u>				
Staff costs:				
Non-industrial				
Industrial				
Contract staff				

### Travelling and subsistence:

Home  
Overseas

Training expenditure  
Recruitment expenditure  
Office machinery etc

Accommodation costs  
Other capital charges  
  Sub-total  
Central administration

Total costs

### Recharges

To research projects  
To other cost centres

Net cost/(surplus)

Units recharged

For other capital equipment not specifically acquired and used for particular research projects, for example, computers and workshop machinery, the best method of arriving at an annual charge may well be to use an approximation to the current replacement cost (less estimated residual value) and to divide this by the estimated useful life to arrive at an updated annual depreciation figure. An alternative approach would be to base the charges for the use of capital assets on historic costs, as held in the inventory system. This, however, would not reflect the consumption of real resources which is taking place. The ultimate decision between the historic and replacement cost basis may be influenced by the approach adopted for the Department of the Environment and the Department of Transport overall.

The entries for costs of accommodation, use of capital equipment and other expenses which do not arise from cash payments should be balanced by credits to suitable contra accounts, which would also include the value of requisitions for payable orders. The whole system should be maintained on a double entry basis, thus facilitating balancing and the posting of correcting journal entries if required.

### 3.3.3 Reports

In the time available it has not been practical to devise detailed formats for the output from the proposed system and to agree these with the users of the information. The best approach to the organisational cost centres, however, is to present detailed statements for the

month and the year to date, each compared with budget, to the manager responsible for each department/division treated as a cost centre, with a summary presented to the next senior manager with whatever supporting details are required in each case. This hierarchy culminates in a suitably summarised statement for the director which highlights the divergencies which need his attention. In each case the manager, assisted as necessary by the finance department, should have prepared brief explanations of any significant variances together with a note of any necessary corrective action he has taken or is taking.

#### 3.3.4 Planning and budgeting

It is essential, if this approach is to produce worthwhile results, that the budgets, both for projects and organisational cost centres, shall have been agreed by the managers concerned with their superiors, so that they have full commitment to them. Budgets are not a matter of line managers asking idealistic bids for scarce resources, bids which are subsequently scaled down by finance and notified back; the line managers themselves must submit realistic estimates and any subsequent alterations should be agreed with the manager concerned. Otherwise the attempt to promote a real sense of responsibility and accountability is likely to fail.

The budgets will flow in large measure from the approved research programme so that the preparation of PIFs and their submission to and approval by customer directorates is an essential part of the budgeting and planning cycle in which the relevant managers must be fully involved. The system must thus also be capable of producing summarised information by SAGs, RRCs and such other groupings as may be appropriate in order to provide an overall picture for these bodies, for TSPU and for ministers as required.

The detailed departmental budgets must therefore be prepared immediately after the submission of the research programme for approval; ideally they should be prepared in parallel with the programme, at least in outline, and, when complete, form the basis of the submission for inclusion in the parliamentary estimates. The linkage between research programme and departmental budgets is crucial since the programme determines the levels of activity in both support services and research departments.

#### 3.4 Implementation

If a computerised costing system is to continue, it is essential that some system is successfully transferred to the Cyber (or a Prime) before the end of December 1981. In the time available it is too much to hope that a purpose-built system on the lines described above could be designed, programmed, tested and made fully operational before the System 4-70 is taken out of commission and removed from site. In any case it would be difficult to change the basis of charging in the middle of a financial year. It is therefore essential that the existing system, or something like it, be transferred as soon as possible. For the future, the system can be developed to encompass all the needs of the new concepts. Part of those needs could, however, be supplied by using a suitable commercial general ledger package to service the project and organisational cost centres and the vote accounting needs, although this might well purpose-built

routines to cope with timesheet input and the consequent entries and to provide history files for projects; these additions might be based on the programs currently being transferred or rewritten. The specification of needs, selection of potential suppliers and evaluation of tenders for such a package would occupy a reasonably elapsed time and thought should be given to this immediately (December 1981) in order to have a change of commissioning a system for April 1982.

The essential steps may be summarised as follows:

- final definition of cost centres,
- determination of units of charge (nearest day, hour, volume of printing?) most suitable to the activities of the direct and support cost centres,
- assessment of transaction volumes,
- detailed definition of code structure, including provision for vote accounting,
- agreement of user requirements,
- specification of system requirements,
- invitation to tender for software;
- evaluation of submissions,
- development and design of changed manual procedures to suit new computer systems.

A particular point to be resolved is the necessity, if software acquisition is required, to seek to avoid the delays which may be imposed by CCTA procedures.

The other essential steps in implementation are tied up with the budgetary process and the changed accountability and responsibility approach which will inevitably require some education of managers.

Staff requirements for the proposed systems have not been estimated but, assuming that most divisions/departments can provide clerical time to input their timesheets via an interactive system on a computer terminal, thus obviating the need for manual analysis and summarisation into batches as for the present MICS system, no additional full time staff should be needed to run the system. System development costs would, however, not be negligible. In-house development would entail the diversion of staff resources from providing advice and assistance to other users of computer services, while the commissioning of purpose-built software from an outside software house would similarly not be a low-cost undertaking.

It is essential that senior staff resources should be made available to manage and monitor the implementation process and it is strongly recommended that Dr. Clough be assisted in this by a small steering committee including members of senior line management who would be users of the new systems.



#### 4. CONCLUSIONS

Mention has been made above of the essential place a changed approach to budgeting and forward planning occupies in the successful implementation of the recommended systems and this cannot be overstressed. Unless realistic budgets are approved, then the output from the systems will be largely waste paper.

In our view an effective costing system is essential as a tool in the efficient and effective management of the substantial resources which are at the disposal of management. It is for this reason that it is recommended that full costs on a rational basis be allocated to projects, so that the cost of individual research programmes is available for measurement against the potential benefits. It is only by monitoring research and other costs against pre-determined plans that informed decisions can be reached.

The commitment that is necessary for success must depend on leadership and management style at all levels of the organisation. We see this as a participative management approach (which does not imply more committee meetings) which instils cost-awareness and the quest for cost-effectiveness into all managers. We hope that this will be achieved.

Finally, we would like to make three general points:

- the costing systems we have proposed would be one of the pre-requisites for adoption of the limited company approach by either establishment. Unless BRE and TRRL can cost and price their services efficiently, potential customers will resent arbitrary charges in respect of effort and overheads,
- the attitude we have outlined to detailed calculation of support costs and overheads is followed in most universities and centres of research, when private sector commissions research contracts from them. There is therefore ample precedent for the application of the costing and charging principles in an 'academic' environment,
- if the systems we have described are to be fully effective, they should operate within an environment which is conducive to good management and which encourages managers to take initiatives. At the moment there are several areas where we consider that the practices of Department of Environment central do not give enough incentive to change or to make efficient use of resources, for example:
  - the Department of Environment does not charge out HMSO services to establishments directly (as do some central government bodies) allowing establishments the choice between alternative providers of the service,
  - the mechanisms for movement between vote heads do not offer incentives to managers to switch resources between categories so that their institutions are more efficiently managed,

- effective financial management is not taken into account in the assessment of managerial performance and suitability for promotion,
- the Department of Environment procedures for the acquisition of micro-computers (at a unit of say £5,000) appear to impose a disproportionately heavy central monitoring role which is contrary to the desired approach of delegating the choice of managerial tools and techniques to managers.

LIST OF PERSONS SEEN

Transport and Road Research Laboratory

The following were seen during the investigation:

R Bridle	Director, TRRL
G Margasan	Deputy Director
T Barrett	
W Bellini	
R Brown	
Dr. W Clough	
W A Lewis	
Mrs G Lovelock	
J Neaser	
D Rutledge	
Miss Sabey	
D Smyth	
F Stokes	
F Weston	

BREAKDOWN OF TRRL EXPENDITURE (BASED ON 1980 OUTTURN)

	£	
<u>DIRECT COSTS</u>		
Cost of 379 Science Group staff (ASO-PSO) whose time is directly related to research projects (including superannuation and employers NI).	4,220,000	
<u>INDIRECT COSTS</u>		
Salaries and Wages etc. of approximately 440 staff whose time is not directly related to research projects. Includes senior staff and personal secretaries, administrative, technical and industrial staff and students.	3,790,000	90
Capital equipment not specifically identified with research projects including an element for new computer system.	500,000	12
Minor items, consumables, stores, etc. Includes contract services.	1,260,000	30
Travel and subsistence of indirect staff.	45,000	1
Postage, stationery, telephones (includes all telecommunication costs).	460,000	11
Accommodation costs Based on an imputed rental value of site. Includes PSA costs to TRRL and furniture costs.	1,320,000	31
HQ pay and Establishment costs This relates to DOE assessed contribution to common services attributed to TRRL. (Includes an element for HMSO allied services but not PSA).	3,330,000	79
Ministers and Senior Staff	20,000	-
	<u>Total</u>	
	10,715,000	
Overhead rate	10,715,000	
	4,220,000	= 254

