

14 Pricing

Introduction

14.1. This chapter examines the pricing or charging principles employed by AEA and the structure of its customer base. We first set out (paragraphs 14.3 to 14.6) a brief account of market conditions and the principal methods of pricing used both in the past and at present. We then consider in more detail each of the main pricing methods currently employed: DEn Programme Letters and *per diem* pricing (paragraphs 14.7 to 14.18); 'cost-plus' pricing (paragraphs 14.19 and 14.20); 'market pricing' (paragraphs 14.21 to 14.23); and what AEA calls 'Bilateral Agreements' (paragraph 14.24). Profitability aspects of these different pricing arrangements are examined in paragraph 14.25.

14.2. We then examine two other aspects of AEA's pricing methods, namely the charges made for AEA's discretionary research programme (paragraphs 14.26 to 14.30); and the approach to charging for work done by one AEA business for another (paragraphs 14.31 and 14.32). Our conclusions and recommendations on AEA's pricing are given at paragraphs 14.33 to 14.52.

Background

14.3. The main work of AEA concerns contract R&D and technical consultancy. Various other services provided by AEA include instrument manufacture and sales of electricity from its PFR at Dounreay. AEA told us that less than 10 per cent by value of its work was subject to direct competition from other suppliers, but that it nonetheless faced competitive pressures because a number of its larger customers were in some cases able to do the work themselves. In other cases, customers might choose simply not to have the work done if the terms appeared unreasonable; or they would not offer subsequent work contracts to AEA, if they were dissatisfied.

14.4. Until the trading fund was established in 1986, over half of the work of AEA was financed by a direct Government grant. Since then, all nuclear-based work for DEn has been done under Programme Letter arrangements which set out the broad areas of work to be undertaken by AEA over a number of years, ie a form of continuing and open-ended contract. Up until April 1990, much of the work for DEn and most other major customers was charged for under the CBI/HMT formula on a 'cost-plus' basis, ie the price equalled the actual or ex-post total costs incurred (including an allowance for AEA's discretionary research expenditure), plus a margin for profit.

14.5. In April 1990 AEA replaced the cost-plus basis with what AEA calls *per diem* pricing (or man-day rates) for all DEn nuclear work and also for work done for some other public sector customers. *Per diem* rates are based on expected or *ex-ante* labour and overhead costs, plus an allowance for AEA's discretionary research and a profit element. Some Government customers, notably MOD, continue to be charged for non-competitive work under the CBI/HMT formula. Thirdly, there is 'market pricing' (which often takes the form of fixed prices) where terms are set at what AEA expects 'the market will bear' (see paragraphs 14.21 to 14.23). Cutting across these three main pricing categories is a further category of what AEA calls 'Bilateral Agreements', which are mostly on either a *per diem* or a form of cost-plus basis, though a small proportion of the work is at fixed prices. Work charged for under Bilateral Agreements accounts for a significant proportion of AEA's nuclear-based work for the Government and also for public sector customers overseas. Overall, around 15 per cent of AEA's work is carried out at fixed prices, most of which comes within the 'market pricing' category. AEA told us that although it would wish to increase the proportion of fixed-price work, 20 to 25 per cent was probably an effective upper limit because of the nature of its work.

14.6. Although AEA has up to 2,000 individual customers, the bulk of its revenue derives from a smaller number of large customers, most of which are Government departments or public sector organisations which taken together account for 80 per cent of the income to AEA's businesses. DEn is the biggest customer and accounts for around half of AEA's total turnover: AEA's 12 largest customers together account for 87 per cent of AEA's total revenue. Information on the turnover of individual businesses by customer sector is given at Table 14.1. The data in Table 14.1 concern the forecast income in 1991/92 of some £358 million which is directly associated with the individual businesses. AEA's total turnover forecast for 1991/92 is £452 million, the difference of £94 million being income to the sites organisation, CHQ, the Corporate Treasury and the Corporate DRAWMOPS Directorate.

TABLE 14.1 AEA businesses' income:* customer sectors, forecast for 1991/92†

	<i>£ million</i>									
	<i>FS</i>	<i>D&R</i>	<i>FUS</i>	<i>RS</i>	<i>InTec</i>	<i>S&R</i>	<i>E&E‡</i>	<i>APS</i>	<i>AEAE</i>	<i>Total</i>
Government, nuclear	8.0	65.6	20.1	77.7	0.3	8.8	2.5	-	10.8	193.8
Government, non-nuclear	-	-	-	-	7.9	1.2	14.3	5.7	0.7	29.8
Public sector, nuclear	2.9	11.8	-	43.7	1.9	0.4	1.4	-	1.3	63.4
Public sector, non-nuclear	-	-	-	-	-	-	0.9	-	-	0.9
Overseas, nuclear	11.0	2.0	4.9	3.5	-	0.9	0.3	-	1.2	23.8
Overseas, non-nuclear	-	0.3	-	-	10.5	0.3	1.1	2.1	-	14.3
UK industry (private)	<u>0.2</u>	<u>0.6</u>	<u>0.1</u>	<u>1.6</u>	<u>15.6</u>	<u>4.6</u>	<u>2.3</u>	<u>6.2</u>	<u>0.6</u>	<u>31.8</u>
	22.1	80.3	25.1	126.5	36.2	16.2	22.8	14.0	14.6	357.8

Source: AEA.

*See paragraph 14.6 for details of £94 million of other income.

†As at August 1991.

‡Based on 1990/91 actuals inflated to 1991/92 levels.

Programme Letters and per diem pricing

(a) Programme Letter arrangements

14.7. Programme Letters were introduced in April 1986 as the main contractual basis for organising the non-competitive or 'single tender' nuclear work to be undertaken by AEA for DEn. Under the trading fund arrangements one of the main objectives of introducing Programme Letters was to establish a clear customer-contractor relationship between DEn and AEA. Each Programme Letter sets out the main areas of work to be carried out under a four-year rolling programme.

14.8. The detail of Programme Letter work is usually proposed and specified by AEA itself and then agreed with DEn. Although the Programme Letter documents contain a considerable amount of information on current and future areas of work, including individual tasks and, in some instances, particular 'milestones' for progress, work programmes are often specified on a continuing and open-ended basis. DEn has recently expressed concern to AEA that 'there is something missing at the intermediate level. The grouping of tasks into Technical Areas seems to lack focus with no clear medium-term objectives and arguments for why work is being carried out'. To remedy this, DEn has proposed introducing the concept of 'blocks of work' within Programme Letters which would specify in more detail the work to be undertaken within a set time, with a maximum period of three years for each block. AEA told us that it had now accepted these proposals.

14.9. For the year beginning April 1992, AEA will undertake work for DEn under 11 separate Programme Letters, excluding the Restructuring Programme, which is considered in Chapter 9. Details of AEA's actual income from Programme Letter work for 1990/91 and its bids for 1991/92 through to 1994/95, which indicate expected income, are given in Table 14.2. An account of the work involved in Programme Letters applying after April 1992 (other than the Restructuring Programme) is provided at Appendix 14.1. As can be seen from Table 14.2, the DRAWMOPS programme is by far the largest, costing in excess of £100 million per annum. The three largest programmes, DRAWMOPS, Fast Reactor and Fusion, account for about 85 per cent of the expected income to AEA from Programme Letter work.

TABLE 14.2 AEA Programme Letter income* from DEn, for 1990/91 (actual) and the period 1991/92 to 1994/95 (expected)

	<i>£ million</i>				
	<i>Actual</i> 1990/91	1991/92	<i>Cash of the year</i> 1992/93 1993/94		1994/95
Fast reactor	71.1	60.2	54.1	55.5	38.7
Fusion†	17.7	15.8	16.0	15.5	15.3
DRAWMOPS	82.3	107.8	133.0	124.8	145.4
DRAWMS	5.8	7.4	9.1	9.6	10.2
NMM	3.7	2.7	2.9	3.1	3.3
NIREX	3.0	3.3	4.4	5.8	4.5
Radiological Protection Research	0.6	0.5	0.5	0.5	0.6
GNSR	2.0	1.7	2.0	2.0	2.1
Safeguards	1.5	1.5	1.5	1.6	1.6
Advisory services	2.5	0.9	0.9	0.9	1.0
Pre-trading fund liabilities	-	3.2	4.4	3.7	4.6
Public information	3.1	2.2	-	-	-
Early retirement	3.6	-	-	-	-
Winfrith reactor	5.4	-	-	-	-
Total	202.3	207.2	228.8	223.0	227.3

Source: AEA.

*Excluding grants from DEn for restructuring costs. See Chapter 9.

†Excluding income from Euratom of around £4 million a year.

14.10. In addition to being the largest in cost and revenue terms, the DRAWMOPS programme, which is concerned with decommissioning AEA's nuclear facilities and managing its radioactive waste, is the only DEn programme that is forecast to increase significantly over the next few years. A recent (June 1991) internal report by DEn examined this programme and the related decommissioning and radioactive waste management studies (DRAWMS) and NMM programmes. It expressed various criticisms of the current arrangements and made a number of recommendations. The report also commented that 'The structure of payments at the moment provides the wrong incentives. The *per diem* system is a useful move away from cost-plus, but is limited'; and it recommended that in the future DEn should agree fixed prices with AEA for an increasing share of the work.

14.11. DEn is the only major customer for which AEA operates under Programme Letter arrangements. The Department of Health employs a Programme Letter along DEn lines for a Radiological Protection Programme, but otherwise customers employ normal commercial contracts. Almost all staff time on DEn Programme Letter work is now charged for at *per diem* rates which are calculated separately for each Programme Letter: under 1 per cent of the work, AEA added, is at fixed prices, though this figure will rise as fixed pricing increases in the DRAWMOPS programme. Capital expenditure which is deemed necessary to meet Programme Letter requirements is financed as part of general Programme Letter costs and paid for as and when it arises. More specifically, capital outlays under Programme Letters are treated as what AEA calls 'revenue schemes' and are not capitalised and paid for through annual depreciation allowances. Revenue schemes are considered further in Chapter 11.

(b) *Per diem* pricing arrangements

14.12. As explained in paragraph 14.11, most Programme Letter work is currently charged for under *per diem* arrangements. Most other non-competitive or single-tender work for DEn is also now priced on a *per diem* basis. Additionally, most of AEA's work for HSE and around half the work for both BNFL (by the businesses) and Nuclear Electric PLC is currently on a *per diem* basis. In contrast, most work by the businesses for MOD is currently undertaken on a cost-plus pricing basis under the CBI/HMT formula, which is considered further in paragraphs 14.19 and 14.20.

14.13. Whilst there are differences of detail in the pricing to different customers, all of AEA's *per diem* contracts include essentially three main elements, namely the *per diem* rates covering labour and overhead costs; an inflation adjustment formula; and charges for other costs of a project, including the purchase of

material and equipment, subcontracted work and the cost of other services, such as computing. AEA's charges for its discretionary research programmes are considered separately in paragraphs 14.26 to 14.30.

14.14. AEA told us that the main cost elements used to establish DEn nuclear *per diem* rates for 1990/91 were forecast staff costs for the year ahead, using eight separate 'pay bands', and AEA forecast overhead costs which were calculated separately for corporate overheads, site overheads and business-related overheads (see Chapter 4). In the calculation of *per diem* rates, overhead costs were taken as a proportion of direct staff costs. A charge for AEA's discretionary research expenditure (CIRE) was then added as a proportion of staff plus overhead costs; and finally a profit margin was allowed for, calculated as a proportion of aggregate costs plus the CIRE charge, to give an overall *per diem* rate. Direct staff costs typically accounted for around one-third of the total *per diem* charge.

14.15. Because AEA has nine businesses operating over several sites, each of which has different overheads, the calculation of total overhead costs for a particular type of work usually involves some form of weighted averaging of such costs. For DEn Programme Letter work, separate *per diem* rates are set in this way for each programme; and in the case of DRAWMOPS there are a number of rates calculated by site and by business. For other customers, *per diem* charges have been calculated by broadly-defined 'work categories'.

14.16. Because *per diem* charges have been set in most cases for three years before they are reviewed, AEA negotiated an annual 'inflation adjustment formula' with most of its *per diem* customers as a means of updating the rates applicable from one year to the next. The *per diem* charges to DEn for 1991/92 are the 1990/91 rates uplifted by 7 per cent: the rate of uplift for 1992/93 is currently under discussion between DEn and AEA. DEn told us that there would be a review of the Programme Letter *per diem* regime in the summer of 1992. For other *per diem* customers, the inflation formula used increases the *per diem* rates by approximately 90 per cent of cost inflation, which is estimated on the basis of a composite labour and materials index derived from published Government data. AEA provided us with a comparison of this index with the Retail Price Index (RPI) over the period January 1988 through to mid-1991. This showed that AEA's index had been less volatile than the RPI, but that it had also been mostly at a higher level. AEA told us that whilst it continually sought to improve its efficiency, it did not set formal targets for annual gains in efficiency or productivity. Nonetheless, it added, a reduction in site unit costs of about 12 per cent between 1990/91 and 1991/92 was achieved (in constant price terms).

14.17. AEA told us that it saw two main advantages in shifting from cost-plus to *per diem* pricing. First and most important, *per diem* charges provided a greater incentive to AEA to seek cost efficiency in its work, since cost savings achieved during the period when *per diem* rates were fixed would mostly accrue to AEA as increased profit. Secondly, AEA told us that, although there was less cost transparency than under cost-plus pricing, price certainty was greater.

14.18. As explained in paragraph 14.10, a recent DEn report drew attention with respect to the DRAWMOPS programme to what it saw as the limitations of the present system; and recommended that fixed pricing should be applied to an increasing proportion of DRAWMOPS Programme Letter work.

Cost-plus pricing

14.19. Most AEA work undertaken for MOD, the Department of Trade and Industry, the Department of the Environment (DoE) and other Government departments and Crown bodies apart from DEn and HSE is charged for on the CBI/HMT formula basis. The framework used for determining allowable costs and the profit rate on such work is in most instances a formula agreed between the CBI and HMT for work commissioned on a non-competitive basis. This formula and the permitted profit rates are reviewed periodically by the Review Board for Government Contracts. There are separate rates of permitted profit for risk and non-risk contracts. The latest review was in 1990 and the results were published in July of that year (ISBN 0 11 772636 2).

Although the Review recommended an increase in the permitted rates of profit, MOD (on behalf of the Government) declined to accept its recommendations and the Government imposed the continuation of the previously established rates of permitted profit. In some instances (under 5 per cent of the total in AEA's case), the CBI/HMT formula is used to establish a fixed-price contract and in such cases the higher risk rate of profit is always applied.

14.20. As explained in paragraph 14.17, cost-plus pricing generally offers little incentive to the contractor involved to reduce its costs, since any cost savings achieved during the course of undertaking a job of work will normally be passed on to the customer. This process is reinforced for cost-plus contracts under the CBI/HMT formula by the rights granted to audit the contractor's costs. Nonetheless, cost-plus contracts may in some cases include a profit and cost-savings formula whereby savings are shared between the customer and the contractor.

Market pricing

14.21. Just over one-quarter of AEA's total business revenue derives from work charged for on the basis of 'market pricing' where AEA seeks to maximise its profits by charging the highest price that it considers the market will bear. Most of this work, around 60 per cent of the total, is at fixed prices. For the remainder of this work, which often involves research and consultancy services where the final output of the work may be uncertain, daily charging rates are agreed through negotiation between AEA and its customers. AEA contracts with overseas customers are generally priced on the basis of market pricing. The expected value of such contracts in 1991/92 is £31 million, which constitutes nearly 30 per cent of expected business revenue from AEA sales charged for at market-determined rates. All AEA contracts with United Kingdom private sector industrial customers are on the basis of market pricing. In 1991/92 the expected value of such work by the businesses is £32 million which, as with overseas customers, constitutes about 30 per cent of total AEA income from work charged for at market prices.

14.22. AEA provided us with details of a number of contracts that had been charged or bid for on the basis of market pricing. AEA also told us that in many circumstances where market pricing was applied AEA was competing against at least one other supplier in a competitive tendering situation.

14.23. Customer views on AEA's prices are considered in Chapter 16. Most customers rated AEA as offering reasonable value for money at present, albeit that AEA was viewed as a relatively high-cost organisation; a few of the nuclear customers considered that AEA offered poor value for money. AEA told us that it saw itself as a high-technology organisation with specialised skills that were expensive and that it was not therefore a 'cheap and cheerful' supplier. In our customer survey there were few complaints that AEA charged excessively high prices for its work.

Bilateral Agreements

14.24. AEA does a significant amount of work for both the Government and overseas customers on the basis of what it calls 'Bilateral Agreements'. For 1991/92 the value of this work is put by AEA at £63 million, which constitutes 18 per cent of total business revenue. AEA told us that Bilateral Agreements covered any special pricing arrangements which fell outside the other pricing categories. The work is mostly nuclear-based and is comprised mainly of part of the Fast Reactor programme for DEn, parts of the Fusion programme and a range of contracts with overseas public sector bodies, especially the EC Commission. Fusion and RS are the principal businesses concerned. AEA told us that Bilateral Agreements may be priced on a cost-plus, *per diem* or fixed-price basis but that no particular profit rate applied.

Profitability of different pricing arrangements

14.25. AEA told us that it now sought to charge for its products and services on a fully commercial basis and that it saw the shift from cost-plus to *per diem* pricing as being central to achieving its objective of increasing its profitability to a fully commercial level. The nominal profit margins are the same for both *per diem* charges and non-risk cost-plus work.

However, under *per diem* charges, most of any cost reductions that AEA is able to effect while the rates are fixed will accrue to AEA as increased profit. AEA was not able to provide us with any information on the out-turn profitability of its *per diem* work. Similarly, it was not able to give us data on the profitability of individual Programme Letters; on profitability by customer or by product; or on the average profitability on work priced at market-determined rates.

Charging for AEA discretionary research

14.26. As explained in Chapter 10, until 1986 AEA undertook 'blue skies' or pre-pre-competitive research which was funded directly by Government grant. AEA was allowed considerable discretion as to what research it undertook. Since 1986 AEA has funded its CR out of its income from customers. From 1986 to 1990 the Underlying Research Programme was financed by a post-profit levy of 10 per cent on nuclear and 3 per cent on non-nuclear work. In April 1990 the name of the CR programme was changed from 'Underlying Research' to the CRAD programme, by which time it had begun to include an element of more commercially-oriented research.

14.27. The name of the discretionary CR programme has now been changed to Corporate Investment in Research and Exploitation. More important has been the accelerating shift in the type of research undertaken from 'blue skies' to 'pre-competitive' and 'near-market' research, ie the research has become more market- and business-oriented than previously. The charging basis was changed in April 1990 from that of a levy on the overall price charged, including an allowance for profit, to that of a pre-profit margin on costs. The rate on non-nuclear work was increased to 4 per cent of total costs in April 1990 and this was further raised to 5 per cent in April 1991. AEA said that in the future it intended to continue increasing the non-nuclear rate until the nuclear and non-nuclear rates were the same. Routine services provided by AEA which are not technology-based, such as accommodation and security, are not subject to the CIRE levy. The CIRE-exempt work categories accounted in 1990/91 for annual revenue of around £130 million.

14.28. AEA currently spends around £21.5 million per annum under its CIRE programme on discretionary CR. In addition to funding the CIRE programme, AEA told us that its businesses individually charged a margin on costs for 'speculative research' to fund pre-contract research. In 1990/91 the combined budget provision of the businesses for speculative research was £4.3 million. Since 1988 AEA has also obtained business development research funds from both DEn and Euratom under what is called the 'key teams' provision in the Fusion Programme Letter. Funding for key teams is scheduled to cease at the end of 1992/93, at which time Euratom will have contributed £1.5 million and DEn will have provided £4 million to AEA. The main beneficiary is the Fusion business.

14.29. AEA told us that it no longer ring-fenced a specific element of contract income for expenditure on the CIRE programme which was now financed from AEA's overall profit margin. In accord with this, CIRE projects are increasingly viewed as commercial investments, to be evaluated and funded in much the same way as capital investment projects.

14.30. The ACOST studies did not address the question of funding for the CRAD/CIRE programme and even the most recent study was not able fully to take on board the changes to AEA's discretionary research under the new CIRE programme.

Charging between AEA businesses

14.31. Approximately 20 per cent of the total turnover of AEA's businesses derives from work done by one AEA business for another. Since April 1990 it has been AEA policy that internal sales are charged for at cost, ie exclusive of any profit element, except for a small amount of work that is done at a fixed price.

14.32. AEA accepts that this 'no profit on internal sales' policy means that the individual businesses are not full profit centres. AEA told us that there were commercial arguments both for and against this policy. The arguments in favour of charging a profit element included the fact that the businesses would then be full profit centres which could therefore be assessed as stand-alone commercial enterprises. Furthermore, choices about contracting out work and about internal versus external sales would be less distorted than at present.

On the other hand, a recent review by AEA (which concluded in favour of the status quo) cited as the main disadvantages:

- internal charging of profits would increase administration and management costs and reduce the pricing freedom of the businesses in their dealings with external customers;
- a key purpose of restructuring AEA into nine businesses was to orient AEA's work towards particular markets and AEA believed that it was central to this that the businesses were accountable for profit within their market sectors rather than being accountable for profit on work which they actually performed; and
- at the corporate level, all business profit was AEA profit anyway.

Conclusions and recommendations

Overall pricing policy

14.33. Most of the work undertaken and the services provided by AEA are commissioned directly by Government departments, notably DEn, and by large public sector organisations. The work involves specialised and high-technology skills employed in research and consultancy projects that are for the most part specified by the customers themselves. It is not surprising, therefore, that whilst a number of private sector companies employ the services of AEA, almost no individual consumers or households do so. Hence, although AEA enjoys a monopoly position in much of its work, it also faces strong 'buyer power' from a number of large and technically informed customers which in some cases are also able to undertake the work themselves.

14.34. A significant proportion of AEA's costs are 'people costs', ie the salary and wage costs of its staff, together with the overhead costs of providing suitable accommodation and essential services. Some AEA businesses, for example Fusion and the PFR part of RS, include large and costly plant and facilities, but these are mostly revenue schemes, where the costs have been paid for by the customers concerned. Generally, therefore, capital costs as defined by AEA are relatively modest in comparison with its staff-related costs.

14.35. Because of its monopoly position and the nature of both its customers and its work, AEA is not usually exposed to a high level of commercial risk arising from unstable market demand. We note, however, that AEA has been and still is faced with potential demand 'shocks' arising from the cessation of particular programmes of work, such as the likely closure of the PFR in 1994. It also faces technological risks because of the 'problem-solving' and technically complex nature of the work.

14.36. Bearing in mind AEA's unique skills and its monopoly position, we considered whether there was any danger of AEA exploiting its customers by charging high prices for its services and thereby earning excessive profits. We note that AEA's stated policy is to seek full commercial viability by raising its level of profit. This policy, however, is fully and explicitly supported by DEn, which is both AEA's largest customer and also its *de facto* owner. Moreover, as mentioned earlier, AEA's other major customers are mostly both technically informed and also able to exercise a degree of buyer power. We are conscious that rather limited data are available at present on the profitability of AEA at both the product level and for individual businesses, but the overall profitability of AEA, currently around 9 per cent on historic cost capital employed, is not excessive and is indeed low compared with other, private sector organisations in high-technology markets.

14.37. We conclude therefore that AEA's pricing policy of charging on the basis of 'full cost recovery', including a reasonable return on capital assets employed, is appropriate and consistent with its objective of seeking full commercial viability.

Methods of charging external customers

14.38. Prior to April 1990 most of AEA's work was charged for on the basis of cost-plus, where the 'plus' represented a specified level of permitted or negotiated profit. We believe, as does AEA, that this method of charging is a 'second-best' approach to safeguarding customer interests and that it offers almost no incentive to the contractor to reduce its costs. Nor does cost-plus pricing further AEA's objective of seeking full commercial viability. The shift away from this method of charging is therefore to be welcomed.

14.39. Ideally in our view, most of AEA's work should be charged for on the basis of 'fixed-price' contracts, with customers, including DEn, seeking competitive tenders from other contractors wherever possible. We recognise, however, as indeed has been argued by AEA, that there are practical limits to this approach. In many instances, for example, AEA possesses unique skills that may severely restrict the scope for competitive tendering. AEA has also made the point to us that 'problem-solving' work and otherwise open-ended contract research does not lend itself readily to specifying contract requirements in a manner that can be charged for on a fixed-price basis. A further potential disadvantage of fixed-price contracts is the possibility that, in order to cover the extra risks involved, the contractor may increase 'contingency' allowances (particularly where the work is not subject to competitive tender), thereby resulting in higher overall prices than would arise under a cost-plus (or *per diem*) system.

14.40. Whilst we recognise such constraints, only 15 per cent of AEA's work is currently charged for at fixed prices and almost all of this work is for non-Government customers. Although AEA has said that in broad principle it welcomes an increase in fixed-price work, it argues that 20 to 25 per cent is a practical upper limit, given the type of work involved. We believe, however, that there is considerable scope for increasing the amount of fixed-price work.

14.41. Where the type of work involved means that *per diem* rates are the best practicable method of charging, we consider that an approximation to a 'fixed price' can be achieved by the use of clearly defined 'milestones' and 'blocks of work' where these are well-specified technically and also time-limited in some way. Indeed this is the direction currently being pursued by DEn and AEA, where blocks of work are in future to be limited to a three-year duration, combined with intermediate milestones of project achievement.

14.42. Moreover, if *per diem* rates are to be set for as long as three years, it is important that customers should have grounds for confidence that they bear a reasonable relationship to AEA's costs, particularly for non-competitive work. Given the 'bespoke' nature of the work categories on which *per diem* rates are based, the initial level set for *per diem* rates, as well as any inflation adjustment formula applied, is inevitably a matter for negotiation between AEA and its customers. Offering a reasonable degree of cost-transparency to AEA's major customers would, we believe, ensure that such negotiations took place on an acceptable basis.

14.43. We conclude that the shift away from cost-plus pricing is to be welcomed and that fixed-price contracts are, wherever they are practicable, a more satisfactory system of pricing than either cost-plus or *per diem* charges. We recognise, however, that because of the nature of AEA's work, *per diem* charges need to be retained for some work. Where that applies, the basis for determining the level of *per diem* rates could nonetheless be improved, so as to safeguard customer interests and sharpen the incentives for AEA to continue to enhance its cost-efficiency.

14.44. We therefore recommend that henceforth AEA should:

- (a) wherever possible, use 'fixed pricing' in its work for existing *per diem* customers and also for work currently done on a cost-plus basis;
- (b) where the use of *per diem* charges remains the best practicable system of pricing, consider the possibility of specifying clearly defined and time-limited 'milestones' and 'blocks of work' as a major feature of the pricing arrangements; and
- (c) when setting the level of *per diem* rates applying to non-competitive work, offer major customers reasonable cost-transparency, by, for example, providing a breakdown of costs, particularly regarding the level and constituent elements of overhead costs.

Internal (or inter-business) charging

14.45. Inter-business transactions constitute around 20 per cent of the total turnover of AEA's businesses and we believe that the basis for charging for such work is a matter of some importance. Except for a small amount of work carried out at a fixed price, no profit element is included in the price currently charged for inter-business work within AEA. This reflects AEA's stated corporate policy established in April 1990, which remains unchanged following a recent internal review. AEA told us that one of its concerns about internal charging of profit was the possibility of inter-business disputes developing.

14.46. Our concern about this policy is that it leads to a significant distortion of profit 'signals' within individual businesses-and also for AEA as a whole-so that:

- reported business profits are misleading and may distort decisions affecting the future of particular businesses; and
- the incentives to contract-out work either to other AEA businesses or to external businesses are distorted and the difficulties of comparing like with like are increased.

14.47. Whilst we recognise that there may be some practical difficulties in changing the present system (ie arising from the possibility of inter-business disputes and the need for sound accounting practice on business profits included in work-in-progress), we conclude that AEA's policy of not charging a profit on its inter-business transactions leads to a loss of accountability and of economic efficiency.

14.48. We therefore recommend that AEA should introduce by April 1993 a new system of arm's-length inter-business charging, whereby profit and other charges (eg for CIRE) are included in the price for such work. We recognise that this may require some additional ground-rules or 'rules of thumb' about acceptable profit margins to be introduced in order to avoid undue complexity and the development of inter-business disputes.

Overhead charges

14.49. Overhead costs are a key element of AEA's charges and typically account, for example, for around two-thirds of *per diem* costs. The main component of overheads is the cost of accommodation and associated services, including security costs that are required for nuclear facilities. The level of these overheads should be influenced by AEA's continuing efforts to improve its general level of cost-efficiency. The incentive to reduce costs further will also be enhanced, we believe, by the recommendations we have made to increase the use of fixed-price contracts for AEA's work. For *per diem* work that remains, the level of *per diem* charges and the element of overhead costs included are inevitably a matter for negotiation between AEA and its customers because of the 'bespoke' nature of the different work categories, as mentioned earlier in paragraph 14.42 (the recommendation in paragraph 14.44(c) offers customers reasonable cost-transparency when setting the level of *per diem* charges).

14.50. Part of the overhead charges is made specifically for AEA's discretionary research programme, on which it currently spends around £21.5 million. AEA believes that maintaining this research programme at about its current level is essential for the continued maintenance of its technical skills and that current customers should pay the full costs. In addition to an overhead margin on most of its work for CIRE, AEA businesses apply a small margin on turnover for what AEA calls pre-contract 'speculative research' (see paragraph 14.28). At present, this raises a further £4 million or so a year, which represents an extra 1 per cent on turnover.

14.51. Although the 'key teams' money referred to in paragraph 14.28 has also been and is currently used for business development research, we accept that this has been a 'one-off' and time-limited source of research finance targeted primarily at restructuring the Fusion business.

14.52. The present structure of AEA's charges for discretionary research therefore includes two different types of charge. There are also different margins applied for nuclear and for non-nuclear work; and some categories of work are totally exempt from such an overhead charge, mainly but not entirely for historical

reasons. However, the overall level of charges, including both CIRE and 'speculative research', seems broadly comparable with other high-technology and research-oriented organisations which are concerned to preserve and develop their technological skills base; and we believe that this is appropriate.