

16 Quality of goods and services

Introduction

16.1. In this chapter we discuss the AEA approach to quality management both through changing staff attitudes towards customer service (paragraphs 16.3 to 16.8) and through formal QA procedures (paragraphs 16.9 to 16.12). We also consider the quality of service targets set for the businesses and actual performance compared with these targets (paragraphs 16.13 to 16.20). Finally, we summarise the views expressed by AEA's customers about the quality of its products and services (paragraphs 16.21 to 16.39). Our conclusions and recommendations are at paragraphs 16.40 to 16.53.

16.2. Following its establishment on a trading fund basis in 1986 it became clear to AEA that a number of initiatives were needed to increase its commercial awareness, to improve its product quality and service delivery performance and to make it more responsive to customer needs. The main resulting corporate initiatives were a culture change programme, a review of management and business training (see Chapter 7), the development of BDIS (see Chapters 5 and 13) and a corporate initiative to improve project management (see Chapter 12).

Culture change

16.3. AEA's traditional corporate culture has been described as a mixture of university-style technical excellence (in the laboratories) and Civil Service-style public service (at CHQ). In 1988 the Board decided that, alongside the reorganisation resulting from the SIP (see Chapter 3), it was essential to develop a systematic process of cultural change. A programme known as 'Focus on the 90s' was initiated using consultants. It concentrated on two areas: customer orientation and commercial awareness. The later stages of the programme were organised by AEA change leaders appointed within each unit, as shown in Table 16.1.

TABLE 16.1 The 'Focus on the 90s' programme, 1989 to 1991-principal features

Phase 1	Four 3-day pilot workshops each sponsored by a senior director, run by consultants	60 senior managers attended
Review	Senior management review	
Phase 2	Nine 3-day workshops run by consultants and AEA change leaders	130 senior managers attended
Review	Senior management review	
Phase 3	25 1½-day workshops run by AEA change leaders	535 middle managers and professionals attended
Review	Presentation of results and review of programme at May 1990 senior managers' strategy conference	
Phase 4	Up to 300 1-day or half-day workshops run by additional AEA change leaders and external lecturers	8,000 remaining employees attended

Source: AEA.

16.4. Following the initial results of a self-audit process (see paragraph 16.7,) AEA believed that 'Focus on the 90s' had made a major contribution to changing attitudes, and that positive actions had resulted in the areas of cost control, customer interactions and internal communications. The programme was subject to senior management review after each phase. It was also the subject of a PJPR, mainly by the change leaders, at the end of Phase 4 in July 1991. They reported a generally positive response and felt that there had been a dramatic shift in the recognition of the importance of customers, although too much commercial thinking was still thought to be confined within existing conventions.

16.5. The PJPR identified a need for more attention to be given to identifying individual training needs, especially in commercial skills. It was felt that 'Focus on the 90s' should have been more closely integrated with other training initiatives designed to meet new performance demands. A need for team-building exercises at local level was also identified.

16.6. The change leaders perceived that there was still too much bureaucracy, a reluctance to delegate and a reluctance to own problems. Parochialism still existed with groups wanting to 'do their own thing' to the detriment of AEA's interests. The need to improve communications was one of the strongest themes to emerge at all levels. There were requests for knowledge about the business/site, about what else was happening at the same location and about the capabilities of parts of businesses at other locations. The change leaders also felt that more effort was required to circulate both the conclusions they had reached and information about best practices around AEA.

16.7. AEA has instituted a self-audit process to measure the extent of the culture change and assess the value of the project. This will be carried out by each organisational unit. A number of potentially useful indicators of attitudes to product quality and customers, and of commercial awareness, have been suggested to the organisational units including:

- customer surveys;
- response times;
- staff being made responsible for major customers;
- awareness of competitors;
- prioritisation of activities;
- number of layers of management; and
- staff attitude surveys.

16.8. Further work will mainly take the form of following up specific issues, especially training in team building, and improving individual commercial skills and internal communications. Some businesses are introducing formal customer care arrangements including key account managers, telephone help lines and better records of enquiries and complaints.

Quality assurance

16.9. The business Chief Executives and Site Directors have responsibility, through a QA Manager, for producing a QA Manual, for setting targets for the penetration of QA and for third-party accreditation where this is commercially advantageous. The Director of Quality and Performance co-ordinates the QA systems adopted by businesses and sites, using the Quality Assurance Policy Implementation Committee as a forum to develop the overall approach. In future, corporate responsibility for QA will come within the scope of the corporate Director of Quality and Information Systems.

16.10. QA within AEA developed in response to specific customer requirements, often but not always related to safety, and in response to safety-related pressure from regulators. Much of the early development of QA was therefore most marked where safety considerations called for QA.

16.11. On the introduction of licensing by NII in 1990, AEA was regarded as a series of sites for licensing purposes. Each AEA site was required to have QA procedures to meet the licence conditions. This called for a flurry of activity to implement QA procedures during 1990. QA auditing programmes were also substantially increased in scope and coverage from the second half of 1990.

16.12. After the licensing-related changes were implemented on a site basis in 1990, it was felt that the adoption of a corporate approach to QA should be considered. A review was therefore undertaken early in 1991. This examined the way in which AEA businesses handled QA in trading with one another and its impact on outside customers. It was decided to introduce a consistent QA policy based on the ISO 9000/BS 5750 standard or equivalent (eg BS 5882 for nuclear plant). At present gaps in coverage exist in some of the industrial businesses, particularly E&E and InTec. All businesses and service providers are now working towards the corporate QA policy and most will achieve adoption of the relevant procedures and instructions by April 1992.

Quality of service targets

16.13. AEA sets annual business performance targets for each business Chief Executive. To date these have been mainly financial and have only tangentially addressed other areas of business performance. The most commonly used quality of service measure employed in the 1991/92 targets was meeting contract milestones to time and cost. The targets are set out in Table 16.2 and have typically been between 80 and 90 per cent, with success in meeting a milestone being interpreted as completion within 14 days of programme. The APS target for DEn contracts was set at 75 per cent because DEn felt that a low target would give the business the flexibility to respond quickly to urgent changes and requests from the customer.

TABLE 16.2 1991/92 business quality of service targets

<i>Nuclear Business Group</i>	<i>Measure</i>	<i>Target %</i>
RS	Success rate in completing/meeting milestones for contracts to time and cost:	
	(a) Ten selected major contracts	90
	(b) Selected milestones within the fast reactor programme	90
	(c) Other contracts completed during the year with a value in excess of £50,000	80
D&R	Success rate in completing/meeting milestones for contracts to time:	
	(a) Selected major contracts	90
	(b) Other contracts with a value of £50,000 or more	80
FS	Success rate in completing/meeting milestones for contracts with a value of £50,000 or more to time and cost	90
FUS	Success rate in completing/meeting milestones for contracts to time and cost	80
<i>Industrial Business Group</i>		
InTec	Level of customer satisfaction with service provided	90
E&E	Achievement of overall high levels of meeting milestones/completing contracts of a value of £50,000 or more to time and cost	85
S&R	Success rate in achieving profits on contracts	90
AEAE	Level of achievement in management to cost and time of AEA projects with a value of more than £200,000 for which AEAE has responsibility	85
	Level of achievement in meeting time-scales on projects for external customers	85
APS	Achievement of overall high levels of meeting milestones and completing contracts to time and cost:	
	(a) DEn	75
	(b) Other customers	90

Source: AEA.

16.14. InTec was the only business to have been set a customer satisfaction target. Performance against this target is to be assessed by means of post-job completion customer questionnaires. It is apparent that the S&R target (profits on contracts) is at best an oblique measure of service quality.

16.15. AEA thus has only a very limited range of measures against which it can monitor progress. There are, for example, no systematic measures of customer satisfaction, of response times, of contract administration delays or of the cost of quality failures.

Performance against quality of service targets

16.16. AEA's performance against the quality of service targets for each business in 1990/91 was discussed at a series of internal Business Review Meetings in May and June 1991. The targets set for 1990/91 were mainly defined in terms of the success rates in completing contract milestones to time and cost, and the full definitions were similar to those shown for the 1991/92 targets in Table 16.2. The available performance data are summarised in Tables 16.3 and 16.4.

TABLE 16.3 1990/91 quality of service performance: Nuclear Business Group

	Targets		Out-turn performance 1990/91
	1990/91 %	1991/92 %	
<i>RS</i>			
Milestones on 10 contracts	90	90	78%
Selected fast reactor milestones	87	90	40% achieved, 20% late, 33% not achieved, 7% cancelled
Milestones on other contracts >£50,000	80	80	81% achieved
<i>D&R</i>			
Milestones on selected major contracts	90 (21 contracts)	90 (10 contracts)	57% achieved, 19% missed due to customer, 5% missed due to supplier, 19% missed due to AEA
Milestones on other contracts >£50,000	80 (111 contracts)	80	73% achieved
<i>FS</i>			
Milestones on contracts >£50,000	90	90	Safeguards Programme Letter: 77% achieved Other Programme Letters: 100% achieved
<i>FUS</i>			
All milestones	90	80	Contract of Association: 82% achieved Commercial contracts: 53% achieved to time 65% achieved to cost

Source: AEA.

TABLE 16.4 1990/91 quality of service performance: Industrial Business Group

	Targets		Out-turn performance 1990/91
	1990/91 %	1991/92 %	
<i>InTec</i>			
Milestones on major contracts	90	N/A	78% allowing for customer contract modifications
Customer satisfaction	N/A	90	N/A for 1990/91
<i>E&E</i>			
Milestones on contracts >£50,000	85	85	87.5%
<i>S&R</i>			
Achievement of profits on contracts	90	90	95% completed at a profit
<i>AEAE</i>			
Milestones on AEA contracts >£200,000	N/A	85	} N/A (AEAE not a business in 1990/91)
Milestones on external contracts	N/A	85	
<i>APS</i>			
Milestones on DEn contracts	75	75	82%
Achievement of budgeted profits on other contracts	90	90	78%

Source: AEA.

16.17. Although some targets were met, AEA acknowledged that performance had been erratic in most businesses and poor in relation to the targets in some. The fast reactor programme, major D&R contracts, and Fusion business commercial contracts stand out as being unsatisfactory, although in every case AEA reported that factors such as changes in specification made by customers or poor performance by suppliers were contributory factors. The 40 per cent milestone achievement by the fast reactor programme was associated with problems experienced in getting the PFR back into operation after an annual safety inspection which revealed a number of steam generator faults. Subsequent performance in this area has been better. In a number of other areas, including the E&E and APS businesses, AEA has been more successful in achieving its milestone targets.

16.18. HSE completed a more detailed analysis of AEA's performance on its Nuclear Safety Research Programme contracts in 1990/91, and this was made available to us. Figure 16.1 shows a histogram of the numbers of contract milestones completed on time or with varying delays. These contracts relate mainly to work carried out by the RS business. Only 60 per cent of contract milestones were completed to time. There was a wide variation in performance between the three constituent research programmes and the 19 technical areas within them. In one technical area none of the four milestones was reached on time, while in the best technical area 86 per cent of the 14 milestones were achieved on time.

16.19. The HSE analysis thus shows a pattern of erratic and not very satisfactory performance within these three safety research programmes. The HSE report stressed that 1990/91 was a year of major organisational and environmental changes throughout the nuclear industry. These changes led to in-year changes in the content and specification of programmes, which had a major impact on performance. AEA confirmed that changes in programme content during the year and the late preparation and authorisation of research protocols made matters extremely difficult for it and weakened control over the programmes. AEA considered that given the exceptional circumstances of the year concerned, this situation may have been inevitable, but acknowledged that it left much room for improvement in subsequent years. The HSE report also highlighted the need for:

- (a) early specification of milestones;
- (b) adequate specification of milestones (in terms of numbers and content); and
- (c) systematic in-year monitoring of milestones.

In-year monitoring of milestones has been instituted for these programmes in 1991/92.

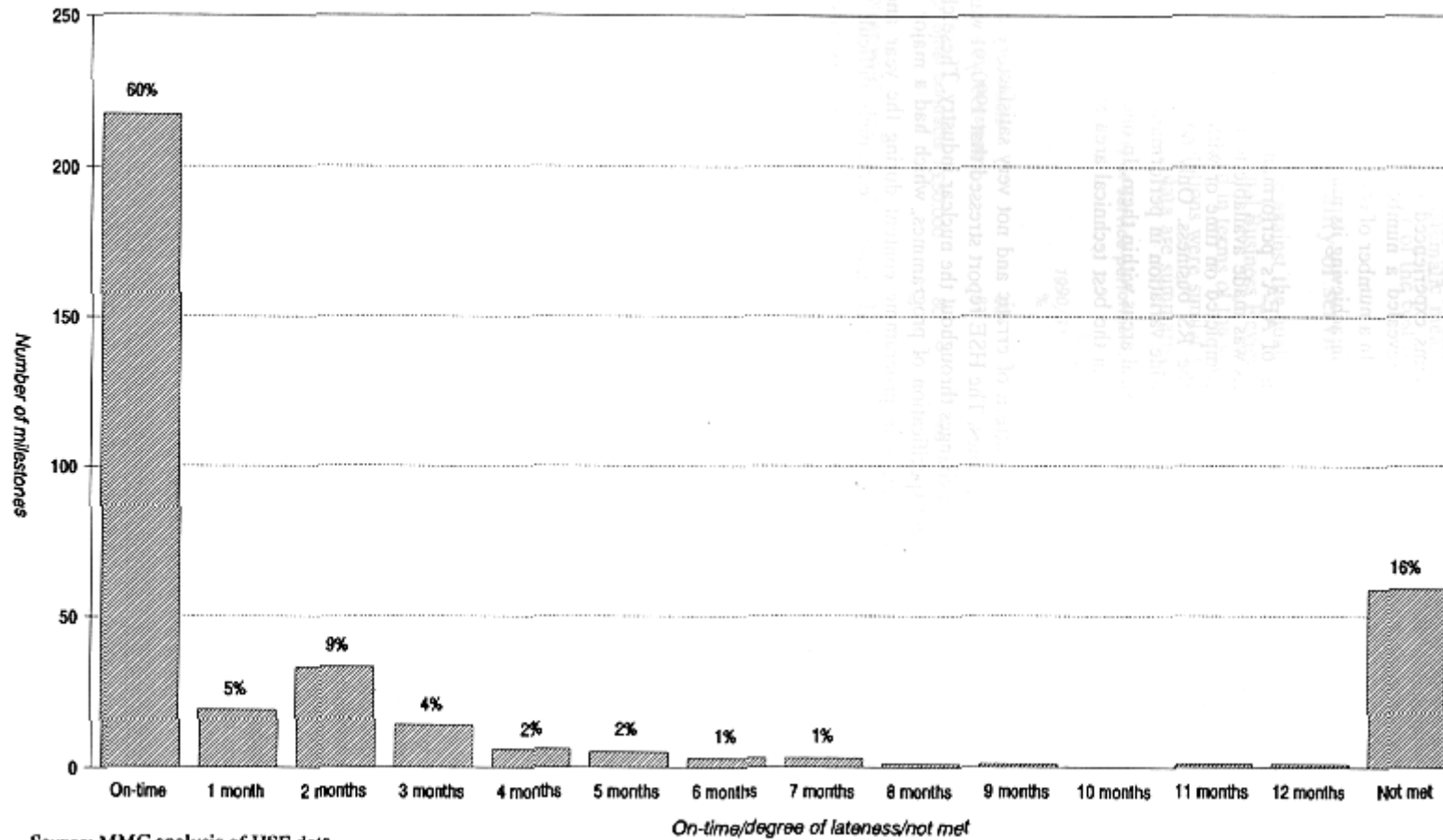
16.20. Taken together, AEA's analysis of its overall performance and HSE's analysis of three specific programmes suggest both that there is considerable scope for improvement and that performance is very variable both within and between businesses and product areas. Some caution is needed, however, in interpreting the performance data. The achievement of contract milestones in research contracts is not directly comparable with (say) the achievement of milestones in a routine minor construction project. In the latter case there is little doubt that the milestone is technically capable of achievement, the necessary technology is well understood and the personnel involved are experienced in its use. On the other hand, some of AEA's research programmes are probing the frontiers of technical feasibility. In these cases it is uncertain whether the milestones will be capable of achievement unless they are very carefully defined in terms of alternative outcomes. Furthermore the technology required to carry out the project may have to be developed as the project proceeds.

Customer satisfaction

16.21. AEA has made some limited attempts to measure customer satisfaction. Harwell carried out a questionnaire survey of 170 customers in the first part of 1990 and S&R used consultants to interview 13 customers in 1988. Spasmodic attempts have been made to use post-contract completion questionnaires but only limited results are available and these are not regularly monitored by senior management.

FIGURE 16.1

Nuclear Safety Research Programme, milestone achievements, 1990/91



Source: MMC analysis of HSE data.

Note: Percentages shown have been rounded.

16.22. The Harwell Survey asked customers to rate AEA's performance on a number of factors on a scale from 1 (completely satisfied) to 4 (not satisfied). The results are summarised in Table 16.5.

TABLE 16.5 Harwell Survey 1990: performance ratings in order of average customer satisfaction

<i>Aspect of performance</i>	<i>Average satisfaction ratings (on scale from 1 to 4)</i>		
	<i>Overall</i>	<i>Nuclear customers</i>	<i>Non-nuclear customers</i>
Clarity of reports	1.3	1.6	1.2
Form of reports	1.4	1.6	1.3
Liaison between staff and customer	1.4	1.5	1.4
Quality of staff and facilities	1.5	1.4	1.5
Meeting agreed objectives	1.7	1.7	1.7
Value for money	1.7	1.7	1.7
Administration	1.8	1.9	1.7
Keeping to agreed time-scales	1.9	1.9	2.0
Overall satisfaction	1.7	1.8	1.7

Source: AEA.

16.23. From these results AEA concluded that:

- (a) failure to meet agreed time-scales was the aspect of AEA's performance that annoyed customers most;
- (b) the administration of contracts frequently let AEA down, particularly with regard to late (and insufficiently detailed) invoicing to Government department customers;
- (c) many customers did not perceive AEA as giving good value for money; and
- (d) failure to meet agreed objectives often caused dissatisfaction (this failure had not always been due to the risks associated with R&D but was sometimes caused by AEA not doing what the customer wanted).

16.24. AEA further concluded, in particular, that the comparison between the ratings given by nuclear and non-nuclear customers showed that:

- (a) less care seemed to have been taken over liaison with nuclear customers;
- (b) AEA's reports (especially their clarity) appeared to satisfy non-nuclear customers, but nuclear customers seemed markedly less happy with reporting performance; and
- (c) conversely, nuclear customers seemed to rate resource quality rather higher than did non-nuclear customers.

16.25. The S&R customer interviews in 1988 concluded that overall most of its customers were very satisfied with the services provided by the business. Criticisms pointed to S&R being 'more technical than professional', lacking flexibility, lacking knowledge of the petrochemical industry, being slow, underestimating costs and presenting results poorly. S&R's technical reputation with its customers was very good.

16.26. In 1989 a consultancy firm conducted a series of interviews in preparation for 'Focus on the 90s' (see paragraph 16.3). The responses suggested that AEA's customers were satisfied with its technical performance. They felt that AEA was accustomed to working at the forefront of technology, demonstrated high technical expertise and was good at grasping new ideas and creative problem-solving. On the other hand AEA was felt to have a tendency to over-engineer, to lack the ability to differentiate between clever ideas and ideas with commercial promise and to pursue technical excellence above all else.

16.27. Interviewees criticised AEA for failing to agree clear briefs with its customers, not seeking their views or discussing options with them, not keeping them up to date with development problems, and not providing one point of contact who was accountable for delivery. They felt that this contributed to projects often being late, over budget and not to specification.

16.28. It was also found that customers did not feel that AEA had a commercial approach or was profit-oriented. AEA was regarded as uncompetitive on price and customers feared that they were paying for the inefficiencies of the organisation. Customers also complained about late invoicing.

16.29. In February 1989, in preparation for the SIP, two of AEA's nuclear customers were interviewed. One felt that AEA was good at doing tightly specified R&D work and had improved its management of R&D projects. Although it regarded AEA as being expensive for R&D it was still 'the first port of call'. AEA was seen as a general problem-solver rather than a group of specialist competences. The other customer suggested that AEA's strength was its nuclear expertise, while its weakness was engineering project management. This customer expected to place a similar volume of work with AEA but felt that it would be very tough for AEA to survive in the world of contract R&D.

16.30. AEA told us that some businesses were now making more systematic attempts to obtain customer feedback. The systems had not, however, been operating long enough to be able to report results. It will be difficult for AEA to judge the effectiveness of its attempts to become more responsive to customers unless measures of customer satisfaction are developed and monitored regularly. The trends they reveal could then become a central part of AEA's quality management control system.

MMC customer survey

16.31. We carried out a survey of a sample of AEA's customers in September 1991 to provide a more up-to-date view of their level of satisfaction with the goods and services provided. The survey results and methodology are discussed in detail in Appendix 16.1. Here we consider the main points to emerge from the survey. The results are based on 141 responses to our postal questionnaire.

16.32. We asked customers to rate AEA's performance on a wide range of factors on a scale from 1 (completely satisfactory) to 8 (not satisfactory). Table 16.6 shows the ranking of the factors in order of average customer satisfaction.

TABLE 16.6 MMC customer survey: ranking of factors in order of average customer satisfaction

Factor	Average satisfaction ratings (on scale from 1 to 8)		
	Overall	Nuclear customers	Non-nuclear customers
Helpfulness of staff	1.9	2.0	1.8
Clarity of reports	2.3	2.5	2.1
Staff liaison	2.3	2.4	2.2
Form of reports	2.3	2.6	2.2
Understanding customer needs	2.4	2.1	2.4
Identifying requirements	2.4	2.4	2.3
Technical performance	2.4	2.3	2.4
Customer problems and complaints	2.6	2.6	2.5
Meeting agreed requirements	2.7	2.5	2.6
Marketing and pre-contract information	2.8	2.8	2.9
Contract administration	3.0	3.6	2.9
Achieving deadlines and milestones	3.2	3.2	3.1
Overall performance	2.7	2.9	2.5

Source: MMC survey.

16.33. The overwhelming majority of customers rated AEA at 3 (equivalent to 'substantially satisfactory') or better in overall performance. Only 19 respondents gave a lower rating. This suggests a small improvement compared with the Harwell Survey average score of 1.7 (on a scale from 1 to 4).

The small differences in the customer satisfaction ratings between nuclear and non-nuclear customers are not in general very significant. The exception to this is the level of satisfaction with AEA's contract administration, which is significantly lower for nuclear customers. Figures 16.2, 16.3 and 16.4 show histograms of the responses for 'overall satisfaction', 'technical performance' and 'achieving milestones and deadlines'. They are broadly representative of the pattern of response to the other questions.

FIGURE 16.2

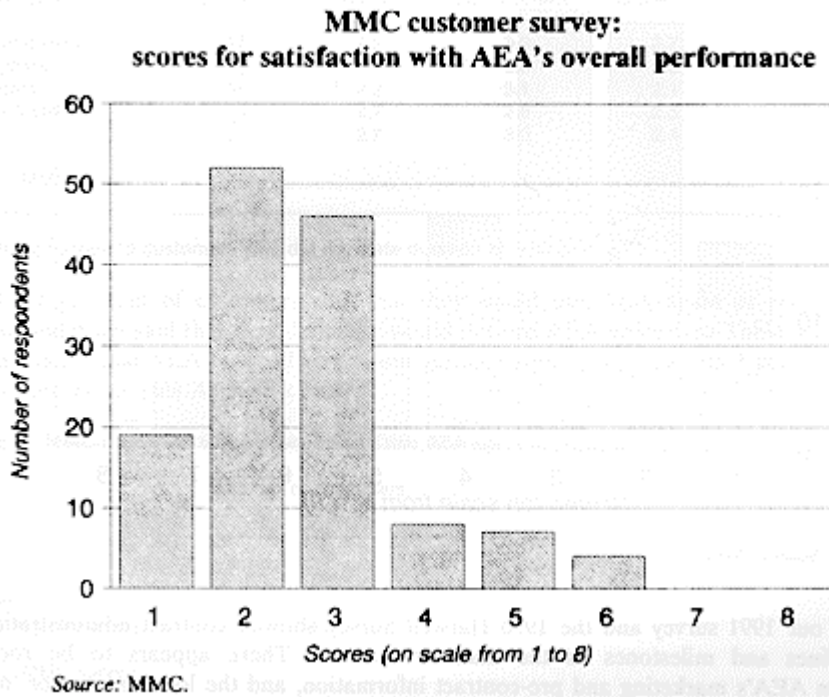


FIGURE 16.3

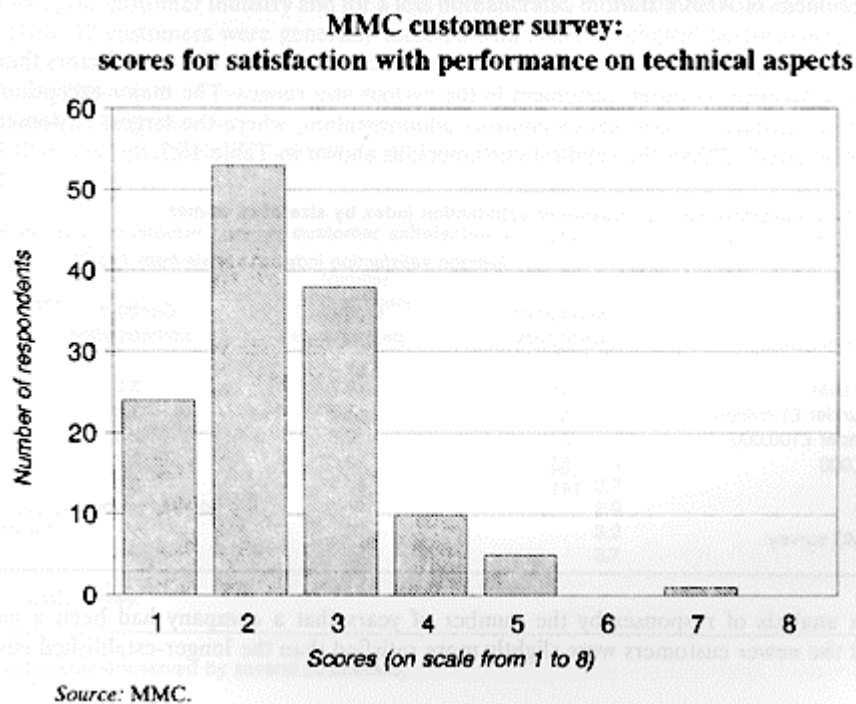
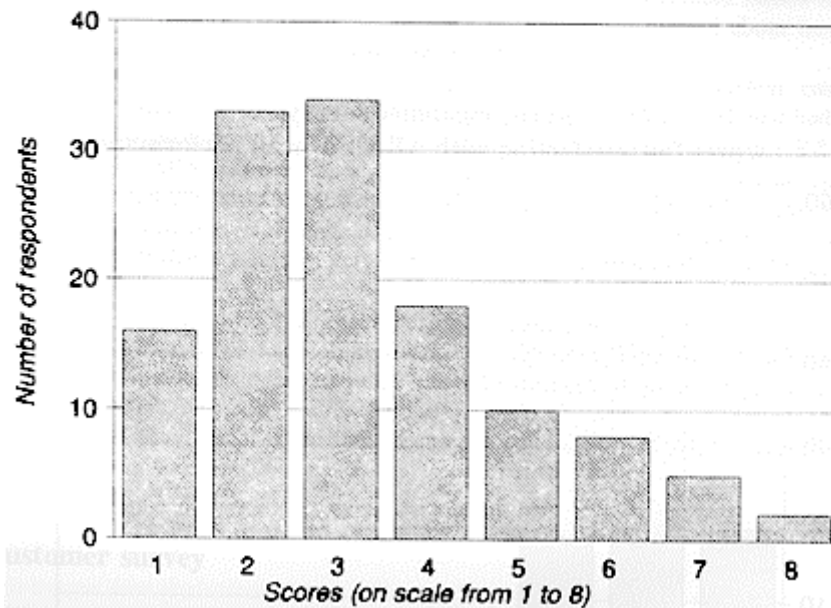


FIGURE 16.4

**MMC customer survey:
scores for satisfaction with achieving contract
deadlines or milestones at the agreed times**



Source: MMC.

16.34. Both our 1991 survey and the 1990 Harwell Survey showed contract administration and meeting deadlines and milestones as the main weaknesses. There appears to be room for improvement in AEA's marketing and pre-contract information, and the low ranking for 'meeting agreed requirements' suggests that AEA may sometimes not deliver what was expected. However, even the lowest of the average ratings shown in our 1991 survey were close to 3 and therefore equivalent to 'substantially satisfactory'. Only five respondents were less than 'substantially satisfied' with the helpfulness of AEA's staff.

16.35. We analysed the results of our survey by annual contract value. For most factors there were no significant differences between customers in the various size ranges. The major exception to this was the level of satisfaction with AEA's contract administration, where the largest customers were significantly less satisfied than the smallest customers, as shown in Table 16.7.

TABLE 16.7 MMC customer survey: customer satisfaction index by size of customer

Annual contract value	Average satisfaction index (on scale from 1 to 8)		
	Number of customers	Overall performance	Contract administration
£1 million and over	28	2.7	3.5
£100,000 but under £1 million	31	2.5	3.3
£50,000 but under £100,000	29	2.8	2.8
Less than £50,000	53	2.6	2.7
All	141	2.7	3.0

Source: MMC survey.

16.36. An analysis of responses by the number of years that a company had been a customer suggests that the newer customers were slightly more satisfied than the longer-established customers (see Table 16.8). This applied particularly strongly to the level of satisfaction with AEA's contract administration. On

the other hand the older established customers had a higher assessment of AEA's technical skills relative to its main competitor (see Appendix 16.1). The differences for those factors not shown were insignificant.

TABLE 16.8 MMC customer survey: customer satisfaction by duration of customer relationship

Average satisfaction index (on scale from 1 to 8)

<i>Duration of customer relationship</i>	<i>Number of customers</i>	<i>Overall performance</i>	<i>Contract administration</i>	<i>Identifying requirements</i>	<i>Clarity of reports</i>	<i>Comparative technical skills</i>
25 years and over	17	2.8	3.9	2.7	2.6	2.8
15 to 24 years	25	3.1	3.3	2.9	2.6	3.2
5 to 14 years	36	2.3	3.1	2.1	2.1	2.8
Less than 5 years	44	2.7	2.9	2.3	2.1	3.3
All*	141	2.7	3.0	2.4	2.3	3.0

Source: MMC survey.

*Includes a further 19 customers who did not state duration of relationship.

16.37. 89 per cent of customers said that they would use AEA again or recommend it to a colleague and none said that they definitely would not use AEA again (see Table 16.9). 54 per cent of customers felt that AEA's overall service was getting better, compared with 7 per cent who felt that it was getting worse (see Appendix 16.1).

TABLE 16.9 MMC customer survey: would you use AEA again or recommend it to a colleague?

Number of customers

Yes	125
No	0
Uncertain	12
Not stated	4
Total survey responses	141

Source: MMC survey.

16.38. Reasons cited by the 12 customers who were uncertain about using AEA again varied but several mentioned the need for better project planning and management, for better knowledge of, and contacts with, the customer industry and for a less bureaucratic, more commercial approach. However, most of these 12 customers were generally satisfied with AEA's technical performance.

16.39. A comparison of customer satisfaction according to the AEA business or service used is shown in order of average customer satisfaction in Table 16.10. FS customers were significantly more satisfied than average, while RS customers and the major nuclear customers were significantly less satisfied.

TABLE 16.10 MMC customer survey: customer satisfaction by business or type of service used

<i>Business or service used</i>	<i>Number of customers</i>	<i>Average overall satisfaction index (on scale from 1 to 8)</i>
FS	5	1.3
APS	13	2.0
E&E	14	2.0
AEAE	6	2.2
D&R	5	2.2
S&R	8	2.6
InTec	54	2.7
Sites Services (including tenants)	7	2.9
Major nuclear*	21	3.2
RS	8	3.7

Source: MMC survey.

*Group of customers served by several businesses.

Conclusions and recommendations

Culture change

16.40. AEA's traditional culture was directed more towards achieving technical excellence rather than towards customer care and satisfying customer requirements in a commercial manner. Over the last three years AEA has sought to develop this latter approach by means of its 'Focus on the 90s' culture change programme. We conclude that:

- (a) AEA has correctly identified the need to change its corporate culture to one which is focused on customer care and a commercial awareness;
- (b) although its culture change programme has been largely successful, considerable further work remains to be done; and
- (c) the PJPR of the culture change programme has identified the need to improve AEA's performance in such areas as identifying individual training needs; internal communications; local team-building exercises; the use of delegation and spreading the use of best practice.

16.41. We recommend that, by July 1992, AEA should develop training and other programmes to build on and extend the culture change achieved through its 'Focus on the 90s' exercise and that these programmes should pay particular attention to the areas of weakness identified in the PJPR of 'Focus on the 90s'.

Quality of service targets

16.42. AEA uses only a very limited range of measures to check on the quality of its products and services. Most AEA businesses monitor only their performance in achieving contract milestones to time and to cost. Only one business uses a customer satisfaction target, while one business monitors contract profitability, which is at best loosely connected with service quality. We conclude that the only quality of service measure for which AEA systematically sets itself targets is the percentage of contract milestones met to time and cost.

16.43. We recommend that:

- (a) by June 1992 AEA should propose a wide range of internal quality of service targets to be used by all businesses preferably including measures of:
 - (i) customer satisfaction;
 - (ii) response times to customer contacts;
 - (iii) the level of customer liaison contacts;
 - (iv) customer complaints;
 - (v) staff attitudes;
 - (vi) contract administration delays; and
 - (vii) disputed invoices;
- (b) each year AEA should select from amongst these measures a small number where improvement is most needed, and set itself and publish quality of service improvement goals for these priority measures; and
- (c) performance against these goals should be regularly monitored.

16.44. The targets set for AEA businesses' success rates in meeting contract milestones typically lie between 80 and 90 per cent, and vary according to the customer group. Although we recognise that in some areas of research milestones may be particularly difficult to achieve, we conclude that the contract milestone targets set by AEA have been insufficiently challenging.

Quality of service performance

16.45. The performance of the businesses compared with their contract milestone targets is often not monitored on a regular basis. The performance data show an erratic pattern of performance, with some businesses performing well while other programmes fall far short of an acceptable standard. We conclude that AEA does not give sufficient attention to:

- (a) ensuring that contract milestones are capable of completion to time and cost;
- (b) specifying and agreeing milestones with customers at an early enough stage in negotiations;
- (c) regularly monitoring the businesses' performance against their project milestones targets; and
- (d) taking prompt corrective action where necessary.

16.46. We recommend that AEA should take steps to ensure that for all future contracts:

- (a) contract milestones are specified at the earliest possible stage in contract negotiations;
- (b) milestones are more adequately specified in terms of their feasibility and precisely defined content;
- (c) intermediate milestones are introduced wherever the phasing of the work allows;
- (d) performance against all contract milestones is systematically monitored throughout the financial year, and summary statistics are reported to each Business Review Meeting in standard format; and
- (e) any milestones delayed by more than three months should be reported to the AEM following the Business Review Meeting.

16.47. The limited measures of product and service quality used by AEA result in its being unaware both of the cost of quality failures and of the trend in this cost. We conclude that AEA does not have systems to estimate the cost of quality failures in terms of repeated work, rectification, delayed payments and lost business.

16.48. We recommend that, by April 1993, AEA should develop systems to estimate the cost of quality failures and should monitor the trends in the cost of quality performance of each business.

QA systems

16.49. Following the introduction of licensing by NII in 1990, each AEA site was required to adopt QA procedures. The development of these systems was therefore mainly driven by safety considerations during 1990. Before then customer QA requirements were also important, but these were often also mainly related to safety rather than the need to ensure that agreed customer specifications were met. In 1991 AEA decided to adopt a corporate policy of developing QA to the BS 5750 standard (or equivalent). Although much progress has been made the main reason for developing QA systems has been safety-related rather than product quality-related. We conclude that:

- (a) AEA is making good progress towards adopting appropriate QA systems throughout its businesses; and
- (b) the need to ensure that agreed customer specifications are fully met has not, however, received sufficient emphasis in AEA's QA systems.

16.50. We recommend that in revising its QA systems to meet the needs of its new organisation by April 1992, AEA should pay particular attention to those aspects of QA which ensure both that the agreed customer specification is met and that the customer is fully consulted about any changes in specification.

Measurement of customer satisfaction

16.51. We carried out a survey of a sample of AEA's customers to establish how they viewed the products and services produced by AEA. The results showed that most customers were satisfied with AEA's offerings although there was room for improvement in some areas. In the main AEA scored well for technical and staff-related aspects of performance but less well for the more commercial and administrative aspects. We conclude that:

- (a) the results of our survey show that there has been some improvement in the level of customer satisfaction since the survey carried out by Harwell in 1990;
- (b) although the great majority of customers consider that AEA's overall performance is 'substantially satisfactory' or better, there is still room for improved performance;
- (c) our survey results suggest that customers are least satisfied with AEA's performance in achieving milestones and deadlines, contract administration and marketing and providing pre-contract information; and
- (d) in response to the areas of weakness perceived by its customers AEA needs to give particular attention to implementing measures designed to improve its performance in meeting contract milestones (see paragraph 16.46), to reduce delays in contract administration (see paragraph 16.43) and to improve its marketing and pre-contract information (see paragraphs 13.45 and 13.49).

16.52. AEA's only major exercise in measuring customer satisfaction was a questionnaire survey of 170 customers carried out by Harwell in 1990. Although some businesses are introducing post-contract completion questionnaires no results are yet available. We conclude that AEA has made only limited and irregular efforts to measure and monitor customer satisfaction in the past.

16.53. We recommend that:

- (a) AEA should ensure that, by June 1992, all businesses develop methods of monitoring customer satisfaction including systematically issuing post-contract completion questionnaires to all substantial customers;
- (b) such questionnaires should cover customer satisfaction with a wide range of aspects of AEA's performance, including the areas identified as weaknesses in our survey, and should be accompanied by personal interviews in the case of the larger contracts;
- (c) the response to these questionnaires should be reported quarterly to each business Board of Management and trends should be monitored by management at all levels; and
- (d) a summary of customer complaints should also be reported to the business Boards of Management.