9 BG's costs and efficiency

Introduction and summary

9.1. The return allowed to regulated companies depends, among other things, on the costs which they project. The question arises therefore as to how far BG's cost projections are justified. This chapter looks at the efficiency with which BG has planned and used a number of operational and capital resources. One major topic concerns the potential for future manpower productivity gains. The use of the natural gas itself, and of BG's plant and equipment, is also covered, as is the effectiveness of BG's substantial capital investment programme. Inevitably much of the information used was supplied by BG itself, though this has been augmented by and checked against independent consultancy studies carried out for OFGAS and other organizations. Where possible we have examined BG's evidence with the help of technical consultants.

9.2. We found that in aggregate BG's system investments appear to have been effective: continued demand growth and switches of gas flow between terminals would have to be borne in mind in assessing whether the timing and geography of system capacity had always been robust. On the limited comparisons we were able to make there was no evidence that BG's current non-gas costs were out of line with those of US utilities. The largest single cost saving for BG for the medium term is likely to arise from the proposed reduction in staff numbers. BG is already planning substantial economies here and has built the corresponding savings into its financial projections; we see no other operating cost improvement approaching this in importance. It may be that some of the assumptions about the staff savings available from reducing from 12 regions to three or four area organizations will prove conservative, but the size of the task means that it takes longer than now planned. Cash realizations from BG's surplus land and property appear to present considerable potential when the market recovers. However, BG's accounting procedures lead to the gain achieved from any development work being taken outside the gas business.

Approach

9.3. The following subjects are dealt with in the chapter:

Productivity trends

Non-gas trading costs

9.4. BG claims that, in the five years to March 1991, it reduced its non-gas trading costs in real terms from £2.542 billion to £2.274 billion, an average of 2.2 per cent a year. BG told us that the 2.2 per cent a year real reduction in non-gas trading costs between 1986 and 1991 was significantly influenced by the reduction in pension costs; and that excluding pension costs, non-gas trading costs reduced by 0.6 per cent a year in real terms. In 1990 BG gave OFGAS projections showing only a 0.3 per cent a year real reduction in non-gas trading costs for the next five years, again excluding pension costs.

Productivity

9.5. BG also told us that there was a rise in the ratio of customers to Gas Business direct employees, from 197:1 in March 1986 to 247:1 in March 1991 (a 26 per cent increase in total), and a rise in therms sold per Gas Business direct employee from 224.1 to 271.2, 21 per cent in total. [

Details omitted. See note on page iv.

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Employee numbers

9.6. These productivity trends were supported by the drop in BG's figures for employee numbers over the period from March 1981 to December 1991, and its projections from then until December 1997, as shown in Table 9.1. (BG later supplied its actual employee numbers at December 1992, shown as a footnote in Table 9.1, and used in the commentary in paragraph 9.74.) The table covers both direct BG employees and the contractors used to augment the direct workforce as described in paragraph 9.75. It shows that, in the past, BG's rate of manpower reduction year to year has been uneven, and had almost died away in the last two years of the period, when manpower numbers stabilized and indeed rose in one year (1990/91). BG said that this change arose partly from the uncertainties associated with its 1990 regional organization review (paragraph 9.58) and partly from the need to rebuild, through additional recruitment, the skills balance which had been undermined by substantial manpower turnover at the end of the 1980s.

Factors in cost improvement

9.7. BG can take action on a number of issues which will improve its longer-term costs. The most important is probably a reduction in total numbers employed, dealt with in paragraphs 9.59 to 9.74. BG told us that the potential cost savings resulting here amount to some £[*] million a year (1992 prices) by the end of 1997. This figure is taken as a yardstick against which to judge the impact of other cost savings considered in this chapter. Other factors offering the prospect of reduced costs for a given level of output of the desired quality include:

- optimization in the purchase of gas, and the minimization of losses and BG's own use of gas in transmission and distribution;

- more effective deployment and operation of the plant, sites and buildings owned by BG;

- savings in the £5.8 billion investment programme contemplated by BG for the next five years; and

- greater use of other assets, such as the substantial telecommunications capacity and skills built up by BG, primarily for the purposes of operating the NTS, but with the potential for additional income earning.

These elements are reviewed briefly in the next section.

Gas

*Figure omitted. See note on page iv.

TABLE 9.1 **BG manpower, Gas Business (full-time equivalents-FTE)**

					Actual								*Projected*		
Date	*3/81*	*3/85*	*3/86*	*3/87*	*3/88*	*3/89*	*3/90*	*3/91*	*12/91*	*12/92**	*12/93*	*12/94*	*12/95*	*12/96*	*12/97*
Direct manpower, Gas Business	100,100	87,302	84,105	80,414	76,583	73,683	72,460	72,706	72,414	[					
Contractor equivalents (FTE)	13,975	12,145	12,200	11,737	11,388	11,745	11,988	11,897	11,953						
Total manpower (FTE)	114,075	99,447	96,305	92,151	87,971	85,428	84,448	84,603	84,367		*Figures omitted. See note on page iv.*				
Year on year percentage change															
-direct manpower		12.8	3.7	4.4	4.8	3.8	1.7	(0.3)	0.4						
-total manpower		12.8	3.2	4.3	4.5	2.9	1.1	(0.2)	0.3						]

Source: BG.

*BG later supplied the actual figure for 12 January 1992: direct manpower 68,054; contractor equivalents (FTE) 11,162; and total manpower (FTE) 79,216.

9.8. BG told us that it was always seeking ways to minimize its gas purchase costs. It had recently examined the additional savings which might be possible from optimizing gas takes over a five-year period rather than on the current annual basis. Because most gas requirements for the next five years were already contracted or committed, the potential annual savings amounted to about 0.5 per cent of its total annual gas purchase bill of around £3 billion. A possible saving of about £15 million a year was, therefore, implied. This saving had been incorporated in BG's most recent financial forecasts. The gain is relatively small compared with the £[*] million a year saving from projected manpower reductions referred to above.

9.9. BG said that, on the basis of a number of measurements which it had carried out, gas leakage now ran at about 1 per cent-say £30 million a year at cost. It was targeting a 3 per cent a year reduction in leakage. BG told us, however, that achieving this would itself require further substantial expenditure. The net benefit in terms of cost savings would, therefore, be significantly below £0.5 million a year.

Plant and equipment

9.10. The longer-term issues of managing natural gas and the BG investment in pipelines, storage and compressors to meet projected demands are dealt with in Chapter 2. In the short term, BG aims to minimize the use of mechanical plant such as compressors, to reduce both wear and tear and compressor fuel costs for a given supply and demand match. BG's financial and operating statistics for 1990/91 show gas worth £46 million used for `own purposes'. We understand that in arriving at this cost BG attributes a value to compressor fuel equal to the average selling price of gas. BG gave us figures showing that the rate of use of gas for compression had reduced in recent years. This was largely as a result of a reduction in the throughput at the St Fergus terminal, though BG told us that the rate was likely to increase over the next few years as flows at St Fergus picked up again. We accept that, as the computer-based running cost optimization for the transmission and distribution system is already fairly sophisticated, it will not provide significant further gains, even in the medium term.

9.11. In addition to its `fixed' plant, BG has a transport fleet, which numbered almost 23,400 vehicles at the end of 1991. A reorganization of the supplies and transport (S&T) function is replacing the original 12-region arrangement with four clusters of three regional S&T services, referred to in paragraph 9.62 in the context of projected manpower savings. BG claimed that these changes, combined with the identification of best practices, had brought the fleet size back to about 6 per cent above that of the early 1980s. This was in spite of the rapidly increasing mobility in terms of the staff per vehicle ratio called for in the early 1980s and, to a lesser extent, in recent years. BG explained that the pressure for greater mobility came, in the customer service sector, from the need to compete with other companies in terms of ensuring a quick response and a good enough range of spares to enable a high proportion of jobs to be completed in one visit. On the distribution side, accounting for about a fifth of BG's commercial fleet, there were similar pressures from the increasing need and ability to carry plant and equipment in the distribution vehicles. The distribution gang size had been reduced to that of the two-man team which now formed the normal mode of operation. A roughly constant ratio between the distribution fleet size and the distribution workforce had been reached, and the fleet size had, therefore, been projected to fall in line with the workforce reductions described in paragraphs 9.61 to 9.74. The scope for achieving significant additional gains from the vehicle budget beyond those already projected would, therefore, seem small.

Capital projects

9.12. BG is planning capital and replacement expenditure totalling some £5.8 billion over the next five years. As with gas purchases, therefore, small percentage gains, say from improved project management, could be important in absolute terms. Some other aspects of BG's capital expenditure as it affects the national and regional transmission and distribution systems are examined in paragraphs 9.19 to 9.43.

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*Figure omitted. See note on page iv.

Other items

Property

9.13. BG owns some 12,000 acres of land and 2,000 buildings. At the end of December 1991 they were valued in its balance sheet at £1.68 billion, about 7.5 per cent of all BG's assets. BG told us that it had completed a Property Asset Management Study with the assistance of external consultants, the recommendations of which had been accepted and were being implemented. Two of the prime recommendations were that users be charged market-related costs of occupation and that management of the company's occupied properties be centralized and become the responsibility of a new property management unit. Valuation of BG's property portfolio in its existing uses was carried out every three years by BG's own professional staff, in accordance with the Royal Institution of Chartered Surveyors' guidelines. We understand that BG disposed of some 1,800 acres in the period from 1980 to the end of 1991, providing capital receipts of almost £250 million. Another 3,400 acres has been designated surplus or potentially surplus to requirements. BG told us that the gross income from lettings of wholly surplus property would be about £8.2 million in 1993.

9.14. BG told us that it seeks to maximize the return from land and buildings, and is taking an increasing role in redeveloping its former operational property. A property development unit, attached to Global Gas, had been set up to ensure that more focused attention was given to the development or disposal of property which had been declared surplus to operational needs. The unit was responsible to the company's Property Executive for the management of BG's whole investment portfolio of surplus land, including current property developments. It i-ncluded property professionals recruited externally. BG believed that most surplus operational sites had problems associated with their former use, notably the chemical contamination resulting from town gas production. Present and likely future environmental legislation, and the depressed property market, therefore, made it difficult to achieve a profitable return on the costs of decontamination. Nevertheless, BG said that it would deal with its surplus property portfolio as soon as market conditions permitted. When offices became surplus to operational requirements, the property development unit undertook to achieve the best return possible, either by letting or sale.

9.15. We understand that BG's current rules determining the treatment of profit from surplus land mean that, following a sale, the Gas Supply Account receives a credit for its former property based on an open market value for existing use in the Gas Business. We assume that this is likely to be quite low, for the reasons outlined in paragraph 9.14. Any further value arising either from the change of planning use or development is then credited to BG's Other Activities Account, as the value will be added by the separate property development unit located in BG's group Headquarters. BG said that, in undertaking any development work, resources from outside the Gas Business were used. The resulting gain was, therefore, credited to the property development unit rather than the gas supply business.

Telecommunications capacity

9.16. BG has a country-wide microwave-based communications network which was originally developed to handle the information flows associated with grid control but has progressively developed to support also BG's other speech and data communications traffic. BG told us that the replacement value of the microwave system is about £60 million, which it describes as tiny by comparison with Mercury or BT. BG pointed out that it used third party assets as well as its own, particularly for telephony, and that it was not self-sufficient in communications, spending £20 million a year on telephone services provided by BT and Mercury.

9.17. BG told us that the communications network had only limited capacity available for marketing to other organizations. Nevertheless, liberalization of telecommunications following the privatization of BT had led BG to examine the potential for third parties to utilize its network. A number of reviews of the potential opportunities had been carried out, the latest in 1992. BG said that the most important conclusion of this study was that, while the UK and international telecommunications market was large and expanding, it was a regulated business with reducing profit margins. While the degree of regulation was itself reducing, margins would remain low and BG would be a very small player in a market dominated by others. To become a major participant in the business would require major long-term investment by BG; the National Grid Company (NGC) had been reported as investing £100 million over the next 18 months at the start of a similar venture. BG felt that, in current circumstances, it could not make this additional investment. This course of action had, therefore, not been recommended.

9.18. However, it had been recommended that BG should generate some income by allowing third parties to use suitable BG sites for telecommunications purposes. Likely income was put at between £5 million and £10 million a year, from a project which was regarded as an `overhead reduction business'. BG said, however, that the project might also be used as a means of acquiring minority stakes in suitable telecommunications business at some point. Broader options, such as allowing the entire communications system to be run by a third party with BG as a priority user, depended on the centralization of BG's trunk communications system. BG was centralizing its system, which would enable such options to be considered in more detail. However, BG told us that the security and reliability necessary for the control of the gas supply system were of such importance that it was unlikely that operation of the telecommunications network by a third party would prove either viable or cost-effective.

Capital expenditure efficiency

9.19. During the inquiry there have been a number of references both, by BG and by users, to the high standards of safety and security offered by BG's system operations. While such high standards may be desirable for safety reasons, and many users are attracted to them, it has been suggested that BG may have incurred unnecessary capital investment to reach the standards by allegedly `gold-plating' the transmission and distribution system. BG strongly denied these allegations. We examined the issues to see, first, whether there was evidence of overspending; secondly, whether BG's investment decisions adequately appraised alternative (and potentially lower-cost) means of meeting demand; thirdly, whether the design standards adopted by BG were unnecessarily high; and fourthly, whether BG was unnecessarily exceeding the standards adopted.

`Gold-plating'

9.20. In its 1990 work on the economic aspects of the new gas tariff formula, OFGAS noted that some commentators had, in the past, raised question marks over BG's pipeline costs, arguing that its system was `gold-plated' and that it was built at a higher cost than necessary. OFGAS, therefore, retained consultants Arthur D Little (ADL) to give an independent assessment of the value of the BG pipeline assets. ADL's approach was to determine costs for the modern equivalent system likely to be installed in the event of replacement or extension of the existing system. They assumed the installation proceeding in a green-field site and in an orderly manner, using quantities typical of annual installation rates for the industry, so that there should be no distortion of current market conditions. The study covered BG's investment in the transmission and distribution pipelines (and the freehold land associated with them), and the `services' pipes which connect customers' premises to the distribution system, gas storage and meters. The consultants' assessment was that the gross current replacement costs, which they had determined for the installation of a modern asset suitable for similar duty to the existing asset, showed good correlation with the data published in March 1990 by BG.

9.21. BG believed that, by assessing the costs of a replacement system to perform the duties of the existing system, the consultants' approach should have shown up any significant difference between capacity and requirement, had this existed, or any overspecification of the system. The similarity between the consultants' assessment and BG's own valuation indicated that there was no such overcapacity or overspecification. In BG's view, the ADL study looked at the system at a point in time which was effectively random. Since, on the snapshot picture, the investment at that point was justified, BG believed that the pattern of investment over time had been justified.

9.22. We accept the OFGAS consultants' views on BG's current system investment. As regards the sequence of investment before and after the consultants' study, we understand that it will often be economic for BG to take a long-term approach to planning system reinforcement investment, and hence install more capacity than is immediately needed. From time to time, therefore, spare capacity will inevitably exist as part of the most economic programme. Interruptible power station or other high load factor sales can be connected without significantly affecting the peak demands to which investment is related. Conversely, switching of inputs amongst the various gas terminals can incur investment even if there has been no net increase in demand.

Over the past ten years there has been a significant switch between St Fergus and the southern basin terminals as gas supplies in the Frigg area run down, a process which is now beginning to reverse as new contracts are being taken on through St Fergus. Any assessment of spare capacity by relating investment to growth in demand would have to take account of changes arising from such factors.

Investment decisions

9.23. BG pointed to its stringent investment and appraisal procedures described below, including the consideration of alternative options and sensitivity analysis, as a safeguard against overinvestment. BG has a detailed set of procedures for the appraisal and approval of investment projects of all kinds. They include separate guidelines for distinct types of project. One such set of guidelines deals with the appraisal of new supply and reinforcement projects, normally to provide additional system capacity to meet a forecast increase in sales or peak demand. BG told us that network analysis is undertaken to identify and define the scope of a project.

9.24. BG recognizes that there will be what it refers to as `economic alternatives' of scope and timing for any given project. These will range from the `statutory case' of the minimum investment necessary to meet tariff growth in premises within 25 yards of a main, to `full growth', where investment aims to provide the capacity to meet all feasible loads which have been identified. Because pipeline, compressor and storage investments result in large step-changes in capacity, an effective engineering solution may provide reinforcement or storage capacity beyond the requirements of the sales growth identified in a defined project. We understand that sensitivity analyses are carried out against different assumptions for key variables, such as demand growth, load factor and alternative price scenarios. A full discounted cash flow analysis, using BG's standard 8 per cent real post-tax discount rate, is required for projects costing over £5 million.

9.25. In addition to the basic peak-day demand growth forecasts, at regional level a diurnal swing of 17 per cent of the peak-day requirement must be provided for. BG told us that about half of this was still met from the conventional gasholders. However, it was extremely unlikely that any more would be built, as storage capacity could now be provided from line-pack at about one-third of new holder costs. 680 gasholders had been demolished since 1976, representing about 20 per cent of the diurnal storage capacity available in 1992. BG regarded the remaining holders as valuable assets but would withdraw them individually as and when their operating and maintenance costs exceeded the full opportunity costs of providing the equivalent capacity from line-pack. About one-third of all diurnal storage is now from regional line-pack. By the same engineering process some further diurnal swing can be provided from existing line-pack capacity in the NTS. In these cases, the investment guidelines lay down standardized reinforcement and diurnal costs per peak-day therm.

9.26. BG showed us examples of both national and regional transmission expenditure proposals. They appear to conform to BG's investment appraisal guidelines, both in terms of the specification of options and their assessment.

BG's security standards

9.27. The three security standards used by BG are described in Chapter 2. Briefly they comprise:

- the 1-in-20 peak-day criterion, primarily used in the design of the RTS;
- the 1-in-50 winter period planning criterion, used, amongst other things, to design the required peak-shaving volume; and
- the 1-in-50 annual supply and demand matching criterion, used to determine how closely sales should be allowed to approach the projected volume of supply.

The last of these differs from the other two in that it does not involve expenditure as such. It is, therefore, not considered further in this chapter.

Peak-day security

9.28. BG argued that it can have no absolute measure of how much to spend on security. Instead it has adopted the approach of costing changes from the present design criteria levels-from a 1-in50 to a 1-in-30 basis, from a 1-in-20 to a 1-in-10, and so on.

9.29. Using this approach, BG calculated in 1991 that the annualized investment cost savings resulting from the transmission projects deferred, if the 1 in 20 peak criterion were reduced to 1-in-10, would be about £4.7 million a year. At about £2 million a year, the projected cost penalties of likely increased failures were less than half these investment cost savings. However, where they did arise, peak-day failures could occur very suddenly and with little warning. A large number of customers might then have to be cut off, requiring BG to break into premises to cut off the supply and make safe, perhaps on a quite large scale. BG felt that the resulting intangible costs would make up the difference between the tangible costs of failure and the investment savings. No change was recommended, therefore, from the 1-in-20 criterion. We note that calculations of this kind are sensitive to the underlying supply and demand match from which the change is measured; if there is current overcapacity against the 1-in-20 peak, the cost of easing the criterion will be depressed. However, in the 1990/91 and 1991/92 period when BG carried out its review, there was a quite close peak match of supply and demand, as shown in Appendix 3.2.

Winter period security

9.30. BG summarized the annualized savings from moving from a 1-in-50 winter period criterion to 1-in-30 as increasing from about £1 million in 1993 to over £5 million in 1996 and continuing at that level. The less demanding criterion would mean an extra risk that some firm customers would have to be disconnected. (Interruptible supplies would already be off at that stage.) The higher failure costs to set against savings would, therefore, comprise loss of profit from therms not supplied, annualized to about £0.14 million a year, together with increased reconnection costs, annualized to about £0.34 million a year. (These quite small annualized figures summarize a range of outcomes for failures which would be expected to occur on average only once every 30 years; if the failure happened in a 1-in-50 year, when only 1-in-30 had been planned for, BG calculated that over 100 million therms of load would be cut off and the actual costs in that year would be about £10 million.) There would also be the intangible costs of an increased level of failure. Although the savings exceeded the increased average costs of failure, BG saw them as relatively small. Because such a reduction in security of supply would be unacceptable to many customers, it was decided that the 1-in-50 winter period planning criterion would be retained.

Storage levels compared

9.31. The translation of particular security levels into the corresponding storage volumes that they require involves two main steps. The first is a commercial judgment of the degree to which a given balance of risks is worth accepting. BG's reasoning on this aspect is summarized in paragraphs 9.27 to 9.30. Secondly, the cheapest way of using the supply mix to meet the peak of demand must be determined. Given BG's policies on security of supply, the principles by which it assesses the best supply mix seem soundly based. But both the commercial judgments and the relative economics of the supply mix will vary from undertaking to undertaking and from country to country, complicating external comparisons with BG's provisions.

9.32. The capital investment in an onshore gas well to provide a given maximum daily rate of output is much lower than for the same output offshore. Economic considerations would, therefore, suggest that, in the Netherlands, where there are onshore gas wells, a smaller proportion of storage than in the UK will be needed to help meet the demand peak. A more demanding peak-day security criterion may also be used. Where supplies are received via lengthy transcontinental lines, more storage might well be desired on `strategic' grounds. This is the case in France and, to a lesser extent, in Germany (because of some supplies from flexible onshore wells). In the USA, where there are both long lines and, in some areas, cheap and plentiful underground stores in the shape of exhausted gas fields, large storage volumes might be expected.

9.33. In every case, commercial judgment about the penalties of failure to supply is a potentially important factor. It is this which may have resulted in Ireland being, as BG told us, the only country to adopt exactly the same risk levels as BG. We also understand from BG that Denmark, Germany and the Netherlands design the peak-day supplies to meet demand at about -15°C, a lower temperature than in the UK, because of their more severe winters. Although the differences in weather conditions mean that it is difficult to compare security criteria directly between the UK and continental Europe, BG told us that the latter would appear to design to slightly higher standards. France and Italy hold up to 20 per cent of annual demand as storage, compared with about 7 per cent in the UK.

9.34. These factors must be borne in mind when considering the figures BG gave us for its storage levels compared with those in use elsewhere (see Table 9.2). They tend to reduce the otherwise marked apparent advantage in BG's practice, but the figures contain nothing to suggest that BG's approach results in an excessive use of storage.

TABLE 9.2 **Comparison of storage capacities**

	UK	*France*	*Germany*	*USA*
Days of storage	24	110	41	70

Source: BG.

Performance against standards

9.35. The way in which BG's transmission and distribution system is operated means that the accuracy with which BG meets its security standards in practice is most easily seen through events in the LNG winter peak-shaving regime. BG's well-established temperature and demand statistics indicate, at the start of each supply year, what severity of winter could, in theory, be met via its peak-shaving stores and beach availability. When the year is over, the actual winter severity in temperature-duration terms will be known. So will the volume of stored gas which might have been expected still to remain under those conditions, as well as the volume actually left. The difference between these two will then show how well the design and operating criteria were met. Such calculations could, in principle, be carried out for any year. But the results are most clearly seen if the winter comes close to the maximum sustainable, because the remaining margin of LNG at the end of the year will then be at its most sensitive to the difference between supply and demand.

9.36. This position occurred in the winter of 1981/82. According to the account in the 1983 report on an efficiency study commissioned from Deloitte, Haskins and Sells (DHS) by the then BGC and the Department of Energy, supplies of Brent gas were not available to BG as had been expected and the amount of LNG stored meant that, in theory, if a 1-in-17 winter was experienced the stores would be empty just before the end of the peak-shaving season. In the event, the winter was marginally less severe than 1-in-17 nationally. BG told us that, at the start of the 1981/82 winter, the LNG/salt cavity stock was equivalent to just under 110 million therms in total. BG's planning data suggested that there should have been some 10 million therms of stored gas remaining at the end of the period, comprising the reserve gas described in paragraph 9.38. In fact, about 50 million therms remained, equivalent to about four or five days' usage at the rate of demand being experienced. The additional 40 million therms was identified by DHS as being due to two factors which were not built into the planned supply for an extended cold period:

- about 30 million therms of additional `reasonable endeavours'[1] gas made available by suppliers; and

- between the two very cold spells experienced it was possible to achieve some LNG refill.

[1]Quantities of gas above the relevant contracted supply profile, nominated by the buyer at short notice, and which the seller is obliged to use reasonable endeavours to supply.

*Figure omitted. See note on page iv.

BG told us that it believed the level of remaining gas did not indicate any overprovision on its part. (Its present view on reasonable endeavours gas is described in paragraph 9.39.) BG noted that the DHS report had concluded that, in the 1981/82 winter, the system had performed very much as planned.

9.37. We asked also about the use of LNG in winters, other than 1981/82, in the period 1981 to 1992/93. BG told us that, in this period, four winters had been colder than average and even these winters had not been particularly cold:

Year	*Winter severity*
1984/85	1 in 10
1985/86	1 in 9
1986/87	1 in 9
1990/91	1 in 4

The figures supplied by BG showed that, at lowest point in the 1-in-10 winter of 1984/85, about three-quarters of the opening LNG stock, planned to meet a 1-in-50 winter, remained. At the corresponding point in the other three winters, the minimum stock represented 85 per cent or more of the opening position; in addition, the weather patterns were such that it had proved possible to refill the LNG stores by the end of the winter. As well as the gas reserved for operating margins (as described in paragraph 9.38), the LNG at the lowest stock point reflected, therefore, not only the relatively mild conditions but also the different patterns of cold spells involved (by contrast with a 1-in-50 winter which tends to be cold throughout). Both factors moved the actual operation some way from the 1-in-50 design conditions. System operations in these years, therefore, cast little additional light on BG's performance as described in paragraphs 9.35 and 9.36.

9.38. BG commented that, had demand reduction measures been needed in the 1981/82 winter, at least 10 million therms of LNG would have been required to maintain supplies during the time taken to implement them. Some gas would also have been needed in reserve to cover for additional incidents such as offshore supply failures later in the year. BG normally plans to retain about 20 per cent of the LNG/salt cavity storage for `operating margins' covering such eventualities.

9.39. BG put the reasonable endeavours gas contribution in 1981/82 at 23 million therms, rather than the 30 million therms reported by DHS. This would be worth some £10.12 million, according to BG's suggested 1992 costs, though a good deal less in terms of the equivalent annualized sum for comparison with the £[*] million a year manpower saving yardstick. Nevertheless, we asked BG about its policy on reasonable endeavours gas. It told us that its approach was to exclude such gas from the supply and demand balance, since there was no guarantee of continuity of supply or that it would be available in the periods of high demand. However, account was taken of the estimates of reasonable endeavours gas in the calculation of the LNG operating margins. This was because BG assumed that the use of stored gas for operating margins could be minimized by fitting it round the availability on the day of reasonable endeavours gas.

Peak-day performance

9.40. Because the ability to meet peak-day requirements is largely a function of the design and operation of the regional transmission and distribution systems, peak-day performance is less easily summarized than that of the NTS over the winter period. The RDS is designed to carry the volume of gas required in the peak six minutes. The effect of weather colder than 1-in-20 is that the duration of demand for that period volume increases. Regions can easily supply demands in excess of the 1-in-20 level, provided that they can take the corresponding gas from the RTS and the NTS for this longer duration. The RTS can provide the gas by increasing transmission at the expense of diurnal storage from line-pack. The NTS can provide the gas by drawing from storage gas which would otherwise be retained to provide winter period security. The tendency of regions' peaks to fall on different days-`diversity'-helps in meeting peak demands.

9.41. We understand from the DHS report that the 1-in-17 1981/82 winter described above (paragraph 9.36) included a national peak day of more than 1 in 16; but in three regions there were coldest days exceeding the 1-in-100 level. BG cited the experience of some regions in meeting daily severities as high as 1 in 70 in the cold spell of January 1987. It noted that although some housing estates across the South of England and in Wales were subject then to low pressures in the distribution system, no failures resulted. BG attributed this partly to the ability of the national system to use stand-by compression and LNG for the very short duration of the cold spell.

Hazard avoidance

9.42. As a result of the King report of 1977, commissioned by the Department of Energy and the then BGC following a number of serious natural gas explosions, BG embarked on an accelerated programme of distribution system replacement. BG told us that, in the period up to 1984, this programme enabled the abandonment of about 21,000 km of small-diameter cast-iron mains, which were those considered to be at primary risk, out of a total mains population of some 232,000 km. Since 1985 BG has replaced about 2,900 km a year of cast-iron mains which were considered to carry second order risks of failure. A risk assessment system covering all BG's regions was implemented in 1987 to help establish the year-by-year replacement programme for these secondary risk mains.

9.43. BG also described its replacement programme to minimize risks from failures amongst its 17.5 million or so `services'-the final part of the supply system, connecting the distribution mains to the customer's meter. In the period April 1984 to March 1992 BG replaced about 3.14 million services. It intended to replace about 315,000 services a year in the period up to 1999 to maintain present safety levels. Table 9.3 shows the relatively low and stable level of incidents in recent years, which BG saw as the outcome of this expenditure. (The broader question of gas-related incidents and fatalities in total is covered in Chapter 10.)

TABLE 9.3 **Explosion incidents associated with mains and services**

	Serious explosions		*Fatalities*	
	Mains	*Services*	*Mains*	*Services*
1986	8	3	2	2
1987	4	5	-	2
1988	3	2	1	-
1989	3	4	3	-
1990	6	1	1	-
1991	3	3	-	1
1992	2	7	-	1

Source: BG.

Productivity management

Management incentives

9.44. BG told us that progress against long-term plans was monitored through the budgets set each year within the framework of the annual Gas Business Plan. As part of the budget cycle, performance management scheme targets were set for all senior management in BG. Financial performance for the managers' own units, as well as the parent business unit (region or Headquarters department) and the BG group, were significant components of the measures used to assess their performance. Others related in particular to the standards of service provided to customers. BG told us that standards of service might contribute 10 per cent to a Regional Chairman's targets which overall would be weighted as: 20 per cent corporate targets, 35 per cent regional profit, 20 per cent regional cash flow, and 25 per cent other individual targets. Progress was reviewed quarterly. Performance indicators for managers at lower levels placed greater emphasis on physical and project management measures. BG claimed that the targets were carried through to successively lower levels of management, starting at group level and moving through Gas Business, regional and district targets down to operational management level.

Bonus schemes

9.45. BG told us that it used incentive schemes for industrial staff to ensure that the workload could be met with the minimum workforce and hence minimum operating costs, while maintaining safety and quality. It had recently consolidated into the basic rate part of the incentive bonus payment under its old Work Studied Incentive Payment schemes. We understand from BG that early results suggest that recorded performance levels of about the same order as before are being achieved. BG considers that this implies a higher effective output.

9.46. In 1992 BG introduced new `output-based' bonus schemes, which aimed to reward the achievement of measurable business outputs, particularly in relation to revenue-earning activities. Payment was not made until a job had been completed to the desired quality standard. BG claimed that a national work measurement databank would improve the efficiency and accuracy with which bonus scheme values were produced. It accepted that the potential conflict between incentives to maximize individuals' output in the new output-based schemes and the BG drive towards total quality management could become marked as the use of standardized work measurement databank values put additional pressures on employees in lower-performing regions. It believed, however, that the new schemes' incentives for employees to ensure that jobs were completed correctly on the first visit made them wholly compatible with the total quality drive. BG told us that in the interests of health and safety, as well as quality, an overall performance limit had been built into the schemes.

Flexibility

9.47. BG described to us the scope for using staff more flexibly across functional boundaries, for example where engineering work affecting the supply to a customer could be dealt with by a multi-skilled engineering and service team, removing the need for multiple visits. It described also the benefits of the Gas Staffs and Senior Officers (GSSO) settlement in 1992, in terms of offering improved flexibility, more effective matching of manpower to workload, and the introduction of new working methods and technology.

9.48. BG told us that, amongst other things, the GSSO review highlighted three types of work flexibility:

(a) *job flexibility*, where employees were now expected readily to take on new duties which fell within the responsibilities defined in new and broader job descriptions;

(b) *working time flexibility*, where the review introduced the potential for the development and application of a range of variable working patterns-these could include, for example, varying winter and summer hours to ensure the best use of capital equipment during long daylight hours; and nine-day fortnights covering extended hours and Saturday working to support service to the customer at times when it was in most demand; and

(c) *locational flexibility*, under which employees could be required to work away from their normal workplace in response to, for instance, temporary imbalances of skills or peaks of workload.

9.49. BG told us that the developments towards flexible working summarized above had been taken into account in the manpower savings projections submitted. The agreements with GSSO and industrial employees already allowed extended service hours and Saturday working. While greater intra-functional flexibility in clerical activities was introduced in 1992 to help deliver increasing standards of service, the cross-functional flexibility needed to mount multi-skilled engineering and service teams had not yet been agreed with the trade unions. Indeed the future requirements for such flexibility were dependent on the outcome of the MMC inquiry.

Gas Business workforce structure

Regional activities

9.50. BG has given us manpower projections on the basis of regional activities comprising:

- appliance trading (based on the BG showroom activities);
- customer service (the gas supply work covering emergency service, safety services and meter work, as well as the separately chargeable installation and servicing work which is carried out on a commercial basis);
- other marketing (mainly housing development, home service and non-domestic sales);
- distribution (the engineering responsibility for the safe operation, maintenance and extension of the regional supply system);
- other engineering (including high pressure pipelines, regional grid control and regional communications and instrumentation (C&I));
- customer accounting (meter reading and the rendering and collection of bills); and
- administration and other, which covers activities such as personnel, financial and management accounting and regional Headquarters support and secretarial staff.

These activities have been used in setting out a number of the manpower tables in the following paragraphs.

Gas Business support activities-Headquarters

9.51. BG told us that during 1991, strategic reviews were completed covering quality and information services and S&T. As a result, responsibility for these activities, previously part of regional managements, had been transferred to Gas Business Headquarters. The services provided by these functions were:

- *Quality and information services.* The quality aspect involved a small central team responsible for managing the total quality (TQ) initiative now under way in all regions. Information services consisted largely of the information technology (IT) activity. This covered not only mainframe computing systems development, maintenance and operation, for areas such as customer billing and stores management, but also an extensive investment in office systems.
- *S&T.* This covered, on the one hand, the entire parts and materials supply chain from ordering, through major warehouses and down to local stores; and on the other, the provision of appropriate vehicle support for all BG's activities.

National transmission

9.52. A major element of the Gas Business, which is based at Gas Business Headquarters rather than regional level, is national transmission. The National Transmission Department is responsible for the NTS providing a secure, safe and economic bulk supply to regions and major users. The operation of BG's national grid control, NTS pressure reduction stations and natural gas supply terminals is, therefore, included; as is the provision of the associated telecommunications, instrumentation and engineering computing, handled by BG's C&I department at national level. National transmission also incorporates gas transportation services (created in 1989 to promote and develop the growth of the transportation business and to ensure the confidentiality of the related information). Gas transportation services negotiates contracts with shippers for the transportation of gas from gas input terminals to customer premises. BG told us that it operated as a commercial unit completely separate from BG's trading activities.

Other Gas Business-Headquarters

9.53. The final activities listed by BG as part of the Gas Business are those of a range of Headquarters support and policy-making units, including those dealing with:

- gas supply and strategy (gas purchasing, associated regulatory negotiations, strategic planning and transportation negotiation); and

- policy formulation direction, support and monitoring, along with certain operational duties, in the fields of marketing, engineering, finance, personnel and operational planning.

Activities outside the Gas Business

9.54. BG told us that it has restructured its former group Headquarters activities to achieve significant net reductions in staffing levels, transferring those services more directly supporting business operations to the appropriate business units and establishing a smaller corporate centre which would have overall financial control and strategic planning responsibilities. Within this arrangement NTS construction activities had been retained as a core service unit providing support to the Gas Business unit; research and technology (R&T) formed a similar core service unit. Alongside the Gas Business in the new structure were the other two main business units, Global Gas (BG's world-wide operations and consultancy arm) and E&P.

Research and technology

9.55. Although BG's R&D is a group activity (referred to internally as R&T) an appropriate recharge is made internally for work sponsored by the Gas Business. In 1992 group R&T costs were about £89 million, about 0.87 per cent of turnover; £57.0 million was recharged to the Gas Business. We had seen an internal BG report which indicated that the `rather crude' ratio of total benefits to costs for the whole programme averaged 9:1. In the context of a potential solution involving separately-owned trading activities, we asked BG what evidence there was about the productivity of differently sized and organized research units in gas.

9.56. As part of a summary of overseas gas industry practice, BG told us that, in Europe, only Gaz de France spanned the entire range of gas supply and utilization activities, which it supported by in-house R&D facilities costing about 1.2 per cent of turnover. Gaz de France had a successful and growing international business based on the technological ability built up in this way. In the USA, BG estimated that total gas R&D spending was about four times the UK total. The largest single component of this spending was accounted for by the Gas Research Institute (GRI). Financed largely by a levy on pipeline users, supplemented by Government funding, the GRI spent the equivalent of £135 million in 1990/91, on a broadly similar range of topics to those covered by BG. The GRI had no research facilities of its own, but placed and managed research contracts with other centres; BG quoted complaints from senior levels within GRI subscribers about the lack of close integration between the R&D work and their businesses, and the bureaucratic overhead involved in contract administration. According to BG, this required some 280 GRI staff on a £135 million programme compared with 40 in BG administering a £90 million programme. The two principal gas utilities in Japan-Tokyo Gas and Osaka Gas-cover a similar range of activities to BG, though their turnovers are respectively about a third and a quarter of BG's. In the past, both had been customers for BG processes, we were told, but they are now strengthening their own R&D capabilities and becoming active in technological development internationally. In 1990/91 they spent 1.71 per cent and 3.36 per cent of their respective turnovers on R&D.

9.57. BG quoted four papers on the measuring of R&D productivity, published in 1990 by the Industrial Research Institute (IRI), an association of about 260 industrial companies, which together carry out over 85 per cent of the industrial research in the USA. BG said that the papers offered at best only semi-quantitative techniques based on qualitative judgments. BG also quoted from reports by the European Industrial Research Management Association (EIRMA), which represents a substantial part of the industrial R&D capacity in Europe. From these surveys, BG concluded that there was no accepted method of measuring relative R&D productivity across R&D units of different sizes. Even the concept of R&D productivity was open to a range of interpretations, though BG had its own measures in use and placed considerable emphasis on monitoring its R&D projects and their cost benefits. BG suggested that experience in other organizations showed the importance of improving the efficiency and effectiveness of the research by maintaining certain minimum levels of skills and facilities, and integrating the work into the business from conception through to implementation.

BG's current regional organization structure

9.58. As a result of a regional organization review announced in 1990, BG's 115 districts were reduced to 90, each with a District General Manager. Each district now serves up to 250,000 customers, with an average size of about 200,000 customers. BG told us that the resulting amalgamation of some of the smaller districts had produced staff savings totalling about 500, although the main aim had been to become more responsive to local customer needs. The existing 12 regions, and their Regional Chairmen posts, were retained, as were Regional Directors of Finance, Engineering, Marketing and Personnel. A new post of Operations Director was created, reporting directly to Regional Chairmen. In total, 27 Operations Directors were appointed. At the same time, the posts of Regional Deputy Chairman and Regional Secretary were removed in the 12 regions, as well as a number of other senior regional posts. At present, therefore, there were two or three Operations Directors in each region, responsible for three or four districts apiece.

9.59. BG gave us information which showed regional employee numbers amounting to about 71,000 (including some 11,000 contractor equivalents) as at December 1992. Table 9.4 gives these figures not only in terms of totals but also as regional averages, to show the relative weights of the various regional activities. The table combines year-end numbers of regional direct manpower posts with the FTE number of contract staff averaged over the year. BG uses this approach to eliminate misleading effects caused by the more volatile use of contract staff. The table illustrates the prominence which might be expected for the labour requirements of customer-driven service activities, and for engineering work on the extensive RDS. Together these two areas account for over 60 per cent of the total manpower. Regional administration, averaging about 770 posts per region (12.9 per cent of the total regional workforce) involves a variety of operational support activities, including personnel, finance, scientific services and public relations.

TABLE 9.4 **Regional employees (including contractors) by function (FTE), December 1992**

	Total regional employees		*Average regional employees*		*%*
Regional Chairman	12		1		
Operations Directors	27		2		
Regional Directors	48		4		
Other administration	7,898		658		
Administration and other BG	7,985		665		
Contract employees	1,208		101		
All administration and other		9,193		766	12.9
Appliance trading		3,152		263	4.4
Service					
Manual BG	14,729				
Manual contractors	2,980				
Staff BG	7,812				
All service		25,521		2,127	35.8
Other marketing		3,785		315	5.3
Distribution					
Manual BG	7,185				
Manual contractors	7,138				
Staff BG	4,689				
All distribution		19,012		1,584	26.6
Other engineering		3,699		308	5.2
Customer accounting		7,004		584	9.8
Total		71,366	5,947		100.0*

Source: BG.

*Entries do not add to 100 per cent because of averaging and rounding.

Gas Business support

9.60. Table 9.5 brings in the employee numbers involved in the direct support activities of Gas Business Headquarters outlined earlier-quality and information services, S&T, national transmission and the Gas Business Headquarters activities summarized in paragraphs 9.51 to 9.53. There are no contract staff involved, so for the purposes of Table 9.5 the 8,000 or so employees in Gas Business support are added to the 60,000 direct regional employees, to give a total of just over 68,000. The contractor equivalents employed in regions, as described in paragraph 9.75, take the total Gas Business figure to 79,216, as at the end of December 1992.

TABLE 9.5 **Gas Business employees by function, December 1992**

	Total employees	
Regional Director and above	87	
Other administration	7,898	
Appliance trading	3,152	
Service	22,541	
Other marketing	3,785	
Distribution	11,874	
Other engineering	3,699	
Customer accounting	7,004	
Sub-total		60,040
Quality and information services	2,986	
S&T	2,633	
National transmission	1,570	
Gas Business Headquarters-other	825	
Sub-total		8,014
Gas Business (direct employees)	68,054	
Contractors	11,162	
Gas Business (all employees)		79,216

Source: BG.

Routes to productivity improvement

9.61. BG outlined to us four main routes to improved manpower productivity over the period 1991 to 1997: rationalization of the Gas Business organization, including some reorganization of the IT and S&T functions; the implementation of new standardized information systems, in conjunction with common working practices based on identified `best practice'; and a broad category of `other changes'. The latter embraced the continuation of the type of technological improvements which BG has pursued for many years (for example, narrow trenching in mains-laying); and incremental improvements in departmental operation flowing from the recommendations of internal consultancy departments and operational management. Though there were considerable productivity benefits from these initiatives, BG indicated that the resulting manpower reductions were partially offset by the extra staff needed to ensure the achievement of the revised standards of service agreed with OFGAS. This has been reflected in Table 9.6, using BG's figure of 750 additional posts, before striking the figure for net manpower savings.

Rationalization of the Gas Business organization

9.62. The proposed S&T management has been described in the context of fleet resource management (paragraph 9.11), and BG told us that parallel arrangements were being developed for supplies. There would then be five central stores to deal with appliances and general stores, with central pipe-yards in similar locations. A national store in the Midlands would provide service for appliance spare parts. They would all supply materials overnight to the districts in their territory. In IT, the plan was to rationalize the current 12-region arrangement into a single systems development and maintenance centre, plus two or three operational centres, serving the Gas Business as a whole. [*Details omitted. See note on page iv.*] In the case of IT in particular, BG acknowledged that there were risks that the projected economies would not be achieved in the original time-scale, largely because of the interaction between the plans for IT and the overall reorganization of the Gas Business.

9.63. BG told us that, at the time the OFT review of competition in the UK gas market was published in October 1991, reviews were in progress to establish what changes might be made to the existing regional and Headquarters organizations in the Gas Business, to improve further both productivity, by reducing manpower numbers, and the effectiveness of operational support.

9.64. These reviews were completed at the end of 1991 and concluded that there was scope for significant rationalization of regional structures in particular, recommending that:

- the district structure remain largely unchanged, apart from adding some further customer contact activities and refining further the range of district sizes;

- all 90 district operations be grouped within three or four areas, with operational support provided from centres in each of those areas and with an increase in the span of control of Operations Directors to between five and eight districts;

- the remainder of the present regional activities be brought under central control and major activities, such as customer billing and supplier payments, centralized at two or three locations; and

- a National Transmission Group, essentially in the present form, be retained.

9.65. BG estimated that, in total, these changes would result in manpower reductions of about [*]. This figure has been included in its projected manpower productivity savings, summarized in Table 9.6. These savings would be derived primarily from:

- organizational compression in terms of reductions in the degree of management and supervision required following rationalization of the existing regional structures, estimated to save about [*] posts; and

*Figures omitted. See note on page iv.

- elimination of duplication in district support activities, by reducing from [*] regional organizations to [*] or [*] area organizations; for some activities, with a high degree of replication, savings of [*] per cent were assumed but, for most activities, economies of scale were estimated at [*] per cent, aggregating to savings of some [*] posts.

Further reviews

9.66. BG explained that these internal reviews were largely complete by the time the OFT's 1991 review was published. The potential impact of creating a separate gas transportation and storage unit, as recommended in the report and as set out in the undertakings subsequently agreed between BG and the OFT, had, therefore, not been taken into account. However, given that creation of the unit would bring together national and regional transmission, district distribution and other district activities, the proposals from the internal reviews were significantly affected. A preliminary assessment of the necessary changes to the review proposals had indicated that the scope for manpower savings would be reduced by several hundred people.

9.67. During the course of our inquiry, BG developed its thinking about the future organization of the Gas Business in the context of the internal separation of its trading activities from transportation and storage. BG told us that it proposed a separation of its trading activities as between its contract trading business (above the tariff threshold of 2,500 therms a year) and its public gas supply business (below 2,500 therms a year). It was currently developing a detailed strategy for separate business units for these three activities. It was also considering the establishment of separate business units for its appliance retailing and customer service activities. Each of these five business units would be a national organization, including local operations and relevant support activities.

9.68. BG said that while this current review would take into account a number of key features of the earlier internal reviews described above, in particular to retain as far as possible a single point of contact locally for domestic customers, it was intended to develop the optimum structure for each individual business unit. This would include a review of the plans for centralized IT and S&T described in paragraph 9.62. BG believed that, while there might be scope for some sharing of these activities, most would be located in the individual business units. It was likely, therefore, that there would be significant differences in organization structures, both between the proposed new business units and as compared with the organizational proposals from the earlier internal reviews. BG told us that the current review was unlikely to be completed until later in the year, as it would need to take into account the recommendations from our inquiry. However, BG expected it to result in plans for improvements in manpower productivity broadly similar to those outlined in paragraph 9.65.

IT benefits

9.69. [

Details omitted. See note on page iv.

]

Other changes

9.70. BG saw major manpower savings from other changes which embraced both technological improvement and gains made by changes driven by functional management and internal consultancy departments. Continued technological improvement would remain important.

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*Figures omitted. See note on page iv.

In engineering, for example, changes such as the increasing use of narrow trenching methods and PE pipe would account for considerable increases in output from the workforce.

9.71. BG maintains a number of internal consultancy departments, whose objective is to foster improvements in the approaches and methods used in existing operations. Usually, though not always, these improvements do not require wholesale changes in methods but will nevertheless lead to useful, but essentially incremental, improvements over current practices. The departments involved include operational research and productivity services which provide services at the request of client departments or managers; and, operating to a remit approved by senior management rather than by clients, the efficiency studies unit. They contribute to a total of `other changes' projected by BG as saving over [*] posts over the planning period.

Balance of improvements

Consolidated projections

9.72. Starting from the December 1991 position covered by Table 9.5, Table 9.6 shows the net effects of BG's planned manpower changes, as described in paragraphs 9.61 to 9.71. In this table, all the figures refer to BG's `direct' employees, as opposed to contract staff. The last-but-one right-hand column of Table 9.6 then gives the projected disposition of direct BG employees at the end of 1997 as a result of these initiatives. The regional aspect of these 1997 projections is repeated in Table 9.7, with the addition of projected contract staff numbers. Table 9.7 therefore shows total projected `regional' employees in a layout corresponding with that used earlier for Table 9.4, except for the `average regional' column, which has been dropped because reorganization will have made it meaningless by 1997.

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*Figure omitted. See note on page iv.

TABLE 9.6 **Projected impact of productivity improvement routes on direct Gas Business employees**

		Productivity improvement route						
	Actual posts (FTE) 12/91	*Rationalization of regions*	*Functional reorganization*	*IT benefits*	*Standards of service*	*Other changes*	*Projected posts (FTE) 12/97*	*Posts saved 1991-97*
Regions								
Regional Director and above	[							
Other administration								
Appliance trading								
Service								
Other marketing								
Distribution								
Other engineering								
Customer accounting								
Sub-total								
			Figures omitted. See note on page iv.					
Gas Business Headquarters								
Quality and information services								
S&T								
National transmission								
Gas Business Headquarters-other								
Sub-total								
Gas Business								]

Source: BG.

TABLE 9.7 **Projected `regional equivalent' employees by function (FTE), December 1997**

	Total `regional equivalent' employees	*Proportion of `regional equivalent' employees (%)*
Senior management		
including Operations Directors	[	
Other administration		
Administration and other BG		
Contract employees		
All administration and other		
Appliance trading		
Service		
Manual BG		
Manual contractors		
Staff BG	*Figures omitted. See note on page iv.*	
All service		
Other marketing		
Distribution		
Manual BG		
Manual contractors		
Staff BG		
All distribution		
Other engineering		
Customer accounting		
Total		]

Source: BG.

*Entries do not add to 100 per cent exactly because of rounding.

Effect of changes

9.73. The summary set out in Table 9.6 shows that, within the definitions outlined in paragraph 9.61, the majority of the projected savings do not flow from the proposed rationalization of regions, unless the IT and S&T changes are included. Instead the gains from technological and other changes are in the majority. After the savings, the projected 1997 disposition of employees to functions in summarized in percentage terms in Table 9.7 is broadly unchanged as compared with that for 1991 in Table 9.4. This suggests that most activities have been slimmed down on a pro rata basis, though the `front line' activities of service, distribution and customer accounting are all slightly more prominent within the 1997 reduced overall total. The `administration and other' category accounts for 12.8 per cent of the total, as compared with 12.6 per cent in 1992.

Comparative performance

9.74. Table 9.1 shows that the total direct numbers employed in BG fell from about 100,000 in 1981 to 84,000 in 1986 and to 72,400 in 1991, reductions of some 16,000 and 11,600 respectively for the two five-year periods. [*Details omitted. See note on page iv.*] BG's figures for the actual position at the end of December 1992, set out in the footnote to Table 9.1, show that the workforce reduction at that point was some 1,300 greater than had been projected. [*Details omitted. See note on page iv.*] But though the rate of BG's projected staff reductions appears, in some respects, ambitious by the standards of the past, the figures do not in themselves give much guidance about the adequacy or otherwise of the absolute productivity levels involved. We have, therefore, sought to make some internal and external comparisons to cast light on this issue.

Use of contractors and contracting

9.75. Such comparisons must be subject to a number of adjustments, and provisos about their use. One adjustment flows from the well-established and fairly widespread use of contractors in BG of whom there were well over 11,000 at the end of 1992, about 14.1 per cent of the total workforce (direct plus contractors). In the operational areas of distribution and customer service (accounting respectively for about 7,200 and 3,000 of the 1992 total of 11,162 contractor equivalents) BG said that the main reason for the use of contractors was to act as a buffer against potential workload variations, enabling BG to maintain a more stable number of skilled direct employees. The letting of contracts enabled BG regularly to monitor current market cost and performance levels. Contracting also provided resources in areas of very specialized skills which BG did not find it economic to maintain in-house, for example in the more technical aspects of IT.

9.76. The presence of contractors gives the potential for achieving an apparent productivity improvement from BG's own workforce, by carrying a greater part of the workload via contractors. We understand that contract staff reductions are monitored as part of BG's cost control procedures. BG told us that the actual levels of the reductions, and hence the ultimate mix of contractors and direct employees, would depend on factors such as the BG productivity improvements achieved and the wastage rate for direct BG staff. [

Details omitted. See note on page iv.

]

So, provided these figures are achieved, there will have been no distortion of the productivity projections for BG's own workforce. For the purposes of this chapter, we have accepted the BG figures for the mix of contractors and direct employees; and carried out our manpower productivity comparisons (paragraphs 9.78 to 9.82) in terms of total (direct and contractor FTE) staff numbers.

9.77. We have seen an internal BG review which touched on the possibility of a more radical approach to contracting out parts of BG's present business. The review suggested that, if BG ceased to provide some of its current services in, for example, contract service, a vacuum would be left in the market which might eventually affect gas sales. It argued, therefore, that consideration could be given to assisting skilled BG craftsmen operating as independent contractors. However, we understand that no specific proposals to this end have been formulated, and that no allowance has been made for such changes in the customer service workload reductions summarized in Table 9.6.

Inter-regional comparisons

9.78. BG described to us the system of medium-term objectives (MTOs), and, since 1989, regional staff (as opposed to manual employee) targets, by which the Company Chairman and Executive reviewed progress on manpower targets with Regional Chairmen. It claimed that these targets were set partly by comparing regions' performances, so as to encourage the use of best practices.

9.79. Table 9.8 shows the December 1992 strength of the regions, varying from the largest, North Western, at about 8,600, to 3,900 for Wales. Regional comparisons may be affected by the way BG makes estimates of the use of contractors. Figures are based on the equivalent number of directly-employed posts. Some regions consequently exclude activities which are wholly contracted out and record only those contract staff carrying out work which would normally be handled either by direct labour or by a mix of direct and contract labour. Although BG believes that this may affect the ranking of the regions in Table 9.8, it considers that the ratios are unlikely to be seriously misleading. Before any comparisons can be approached, allowances should be made for such factors as the size of their respective markets. One relatively straightforward adjustment for individual regional circumstances could be made on the basis of the number of customers handled per employee, as shown in
Table 9.8.

TABLE 9.8 **Regional customers per employee, December 1992**

Region	*Employees (direct + contract, FTE)*	*Customers '000*	*Customers per employee*
Scotland	6,504	1,331	204.6
Northern	4,045	1,001	247.5
North Western	8,608	2,402	279.0
North Eastern	4,677	1,160	248.0
East Midlands	6,860	1,868	272.3
West Midlands	6,485	1,746	269.2
Wales	3,935	859	218.3
Eastern	5,523	1,470	266.2
North Thames	7,321	2,042	278.9
South Eastern	7,787	2,154	276.6
Southern	5,196	1,316	253.3
South Western	4,425	1,114	251.8
All	71,366	18,463	258.7

Source: BG.

Table 9.8 shows that the December 1992 average was 259 customers per employee, with the `best' regions (against this indicator) achieving about 279. This inter-regional comparison tends to favour large regions, owing to economies of scale, and regions with lower proportions of domestic sales, which are labour-intensive. The lower ratios in Scotland and Wales are attributable to the large area covered by these regions.

9.80. As a result of the productivity improvement measures outlined in paragraphs 9.61 to 9.71, in 1997 the aggregate `regional equivalent' employee base is projected (Table 9.7) to be about [*]. BG has told us that its customer base is by then expected to have reached 19.57 million, compared with 18.46 million in 1992. The overall customers per employee figure will therefore be about [*], topping the 1992 best region's ratio by about [*] per cent. The effect is that BG's employee projections for 1997 are some [*] lower than the level that would have been achieved if the best region's figures for 1991 had been extrapolated to the expected 1997 customer base and applied to `regional' activities as a whole.

9.81. The simple customer per employee indicator makes no allowance for regional characteristics, such as physical size or geography, which could be expected to influence staffing in, say, their engineering activities. The indicator could be refined by splitting regional activities into those on the one hand which might be expected to be driven by customer numbers such as appliance trading and, on the other, those influenced by kilometres of main (such as distribution).

9.82. However, we accept BG's view that even this elaboration would not reflect either the differences in workload between regions for new and replacement mains activity, geographical difference such as those between North Thames and South West Regions, or a range of other factors, such as the level of contract servicing and installation activity. We have, therefore, not pursued this reasoning in detail, especially as initial calculations showed that it would add little to the numerical result already established in paragraph 9.80.

Non-gas costs comparisons with US utilities

9.83. A further test of productivity in a high-level sense is the level of non-gas costs achieved. This measure has the advantage of embracing not only both direct and contractor staff costs, but also the changing trade-off between staff costs as such and other costs which may have to be incurred to improve labour productivity-for example, those of increased IT use. In 1990, as part of its tariff review exercise, OFGAS looked at aggregate BG non-gas costs for 1989 compared with those of a number of US utilities. We have repeated the exercise using the latest figures from these utilities (Table 9.9).

*Figures omitted. See note on page iv.

The whole comparison must be seen in the light of the relatively small size of the US undertakings (more akin to a BG region than BG Gas Business as a whole) and the fact that, with the exception of Atlanta Gas, they deal in electricity supply as well as gas. The results, on the basis of their average 1991 figures, confirm the OFGAS view that BG shows up reasonably well in comparison with these US undertakings. The inevitable weaknesses of such comparisons in terms of, for example, the different cost structures of the US utilities must, however, be borne in mind.

TABLE 9.9 **US utility operating costs-comparison with BG non-gas costs**

	1991 Operating costs $	*1991 Operating costs £m*	*1991 No of customers '000*	*1991 Costs per customer £*
Long Island Gas & Lighting Co	564.0	372.5	1,442	258.4
Cincinnati Electric & Gas	537.4	354.9	1,096	323.8
Louisville Gas & Electric Co	271.6	179.4	577	310.9
San Diego Gas & Electric Co	678.7	448.3	1,111	403.5
Iowa Illinois Gas & Electric	193.2	127.6	431	296.1
Brookly Union Gas	396.6	244.1	1,103	221.3
Atlanta Gas	251.3	166.0	1,219	136.2
All	2,865.8	1,892.8	6,979	271.2
BG 1991		3,465.0	18,180	191.0

Source: OFGAS.

Notes:
1. All figures at December 1992 prices.
2. 1991 US results repriced to 1992 levels by applying 3 per cent rise in US consumer price index.
3. 1992 US prices converted to sterling at December 1992 $/£ exchange rate of 1.514.