

## Quality of service

### Introduction

11.1. In this chapter we consider the quality of service provided by the North Board in terms of electricity supply and some aspects of its dealings with its customers. The North Board's performance in relation to the sale and servicing of appliances is considered in Chapter 12.

### Security of supply

11.2. In setting standards for security of supply the North Board, in conjunction with the South Board, draws on the advice issued by the CEGB and the Electricity Council. A summary of the CEGB recommendations is given in Appendix 11.1. It shows the length of time within which minimum demand should be restored for particular classes of customer and the expected maximum frequency of interruption. Whilst the North Board follows generally these nationally promulgated standards, it does depart from them where necessary to take account of the particular geographic and demographic features of the North of Scotland.

11.3. The majority of the North Board's customers are on the East coast of its territory. In that area system design and operation standards are similar to those applied in other mixed urban and rural areas in the United Kingdom. In the more mountainous areas and in the isolated islands some variations in practice have evolved.

11.4. The principal design variations which the North Board has adopted are listed below:

- (a) Generation system connections. In some remote areas local generators feed directly to 33 kV or 11 kV distribution networks rather than the transmission grid. Some small hydro generators on the mainland and the diesel generators on islands are connected in this way and so the construction of higher cost transmission lines is avoided.
- (b) Distribution. Where population is evenly spread it is normal practice to provide ring circuits which give increased security. In the Highlands what little population there is tends to concentrate along the fertile valleys and 33 kV overhead lines are frequently used as spur distributors. These are often very long and uneconomic to interconnect because of the additional length of line required and voltage limitations.
- (c) Overhead line. The North Board has developed the use of light pole construction for 33 kV lines in cases where heavy conductors are not required and environmental considerations need to be taken into account.
- (d) Submarine cables. The North Board has developed its own standards for submarine cables in which it has special expertise.

11.5. The most significant variation in design standards as far as the customer is concerned is the need for more extensive use of spur lines in the distribution system. Where maintenance or fault repairs have to be carried out it is often not possible to do this economically using live line working techniques. For planned maintenance, customers are given notice by postcard and advertisement of pre-arranged outages. For fault repairs, although staff are located strategically, travelling distances can be considerable and adverse weather conditions can add to the problems. As a result the North Board recognises that the supply restoration times set out in Appendix 11.1 for classes B and C cannot always be achieved. Difficulties can also arise with repair of submarine cable. In these cases the North Board aims to provide within 48 hours of failure power from portable standby generators to the island concerned.

### **Refurbishment**

11.6. Security of supply has also been affected by the age and resulting variations in the reliability of the equipment concerned. We considered that subject in some detail in our review of planned maintenance programmes (Chapter 8) and of the refurbishment of the distribution system (Chapter 9).

### **Trade-off between security of supply and cost**

11.7. The North Board told us that there is generally a trade-off in any investment decision between the security and quality of supply and the cost. Until relatively recently the level of security of supply offered by United Kingdom electricity utilities has been set without explicit reference to economic trade-offs and translated into rules for investment decisions. These rules are reflected in 'planning plant margins' for generation investment, and similar margins for investment in transmission and distribution plant. The North Board still acknowledges such methods in its plant investment analyses, for example plant and load tables are produced with margins shown against the levels indicated by the 'planning plant margin'. At the same time the North Board does not consider these methods alone are sufficient to justify plant investment decisions. It regards the methods as a guide to timing and considers them in conjunction with analyses of cost and risk together with the relevant external economic and political factors. More recently, the North Board has devoted increased attention to assessing the costs and benefits of variation in supply standards as part of its appraisal of individual proposals. For a particular case, a range of technically acceptable options is drawn up based on the normal standards. These are then evaluated to determine a least cost solution and a cost benefit calculation is carried out to assess variations above and below the normal standard.

11.8. Different levels of security of supply are assessed on the basis of valuing the consequent variations in loss of supply to customers. Loss of supply is taken to mean not only a revenue loss to the North Board but also loss of goodwill from and hardship to customers. These effects can be minor for domestic consumers but very costly in lost production for some industrial consumers. It is difficult to determine a precise value for loss of supply but

the North Board uses a figure of £2/kWh. This figure is based on an Electricity Council review and is applied to the estimated change in reliability of supply resulting from a variation in design standards. Costs and benefits are discounted at 5 per cent.

11.9. The Electricity Council review recognises that there is a range of values which might be used for the cost to consumers of interruptions to supply. On the basis of an analysis of studies carried out in various countries, the review recommended a 'middle of the road' figure of £2/kWh (at March 1982 prices) with a suggested 'hard-line' sensitivity test using £1/kWh. It also suggested that voltage reductions should be valued at 10 per cent of the disconnections rate.

### Quality of supply

11.10. The quality of supply to the customer may be judged in two ways, freedom from interruption and voltage stability. Both can arise for a number of reasons but voltage drop often indicates a need for system reinforcement. The North Board maintains a record of complaints received from customers about various aspects of its operations including quality of supply. The general question of complaints is considered later in this chapter, but Table 11.1 shows the number of justified complaints received about quality of supply and interruptions to supply over the last five years. In this context quality is mainly voltage stability. The most noticeable feature is the large increase in complaints about quality of supply from consumers in the South Caledonia area in 1984 (see paragraph 11.17).

TABLE 11.1 Analysis of justified complaints about quality and interruption of supplies

Area	Classification of complaint	1980	1981	1982	1983	1984
Aberdeen	Quality of supply	56	63	41	43	40
	Interruption of supply	1	1	0	0	0
	Combined	57	64	41	43	40
Dundee	Quality of supply	—	—	1	0	1
	Interruption of supply	1	—	1	1	0
	Combined	1	—	2	1	1
Highland	Quality of supply	6	11	3	0	1
	Interruption of supply	2	6	2	6	1
	Combined	8	17	5	6	2
South Caledonia	Quality of supply	5	—	3	16	53
	Interruption of supply	—	2	2	3	1
	Combined	5	2	5	19	54
All area	Quality of supply	67	74	48	59	95
	Interruption of supply	4	9	5	10	2
	Combined	71	83	53	69	97

Source: NSHEB.

11.11. As we have already mentioned in Chapter 9, detailed statistics on faults and interruptions to supply are maintained through NAFIRS.

11.12. We examine in the following paragraphs the performance of the North Board in relation to the number and duration of supply interruptions. The statistics quoted should be considered in the light of the difficult conditions prevailing in much of the North Board's territory. Table 11.2 compares the North Board with the South Board and with the average for boards in England and Wales.

TABLE 11.2 System description

	Total system length km			Per cent underground			Consumers per km		
	<i>EHV</i>	<i>HV</i>	<i>LV</i>	<i>EHV</i>	<i>HV</i>	<i>LV</i>	<i>EHV</i>	<i>HV</i>	<i>LV</i>
NSHEB	5,806	22,803	13,741	8	16	48	96	25	41
SSEB	4,480	26,906	23,845	35	47	81	362	60	68
England & Wales	40,337	246,068	295,055	38	44	78	518	85	71

Source: NAFIRS.

11.13. During 1983-84 the North Board experienced a greater number of supply interruptions than any other Area Board and also lost more time per connected consumer. The year included the unusually severe storm conditions of January and February 1984 when the number and duration of interruptions were the highest experienced by the North Board for at least 20 years.

TABLE 11.3 Interruptions per 100 consumers and minutes lost per connected consumer, 1965-66 to 1983-84

	Interruptions		Minutes lost	
	<i>NSHEB</i>	<i>National</i>	<i>NSHEB</i>	<i>National</i>
1965-66	123.9	106.4	131.5	98.1
1966-67	164.0	105.8	152.0	97.2
1967-68	161.8	106.9	241.9	102.8
1968-69	135.0	104.9	162.8	96.6
1969-70	155.8	92.7	171.6	89.3
1970-71	126.2	84.5	138.0	70.9
1971-72	160.3	82.0	180.2	78.4
1972-73	107.3	73.2	107.9	67.9
1973-74	134.3	107.1	226.1	122.1
1974-75	115.1	88.3	127.5	81.7
1975-76	196.4	98.5	335.8	135.0
1976-77	127.0	84.4	159.0	88.8
1977-78	219.7	86.1	575.0	107.5
1978-79	195.1	83.0	234.2	91.0
1979-80	146.1	77.5	165.6	82.7
1980-81	220.7	77.0	225.8	81.5
1981-82	259.8	126.7	255.4	193.8
1982-83	253.7	91.3	260.5	95.7
1983-84	392.0	109.2	1,331.5	142.9

Source: NAFIRS.

11.14. The figures in Table 11.3 show that the North Board has consistently exceeded the national average in the number and duration of interruptions throughout the period. They also show a worsening position in the North Board's territory even if the last year's figures are ignored.

11.15. Within the North Board's territory the performance varies widely from district to district in the distribution Areas. Table 11.4 shows the trend over the five years to 1983-84 for each district in minutes lost per consumer.

TABLE 11.4 Five-year trend—average consumer minutes lost per connected consumer due to:

	<i>All outages (faults and pre-arranged)</i>				1983-84
	1979-80	1980-81	1981-82	1982-83	
National	82.7	81.5	193.8	95.7	142.9
NSHEB total	165.6	225.8	255.4	260.5	1,331.5
A Aberdeen S	83.8	90.2	102.6	73.1	2,224.4
A Aberdeen N	109.0	153.5	145.2	106.2	3,420.0
D Dundee E	15.6	20.2	27.7	24.6	25.5
D Dundee W	24.6	14.9	21.2	23.1	53.0
D Dundee N	75.6	137.1	187.7	101.9	254.8
H Highland C	76.0	69.6	122.2	99.3	548.5
H Highland W	129.8	115.6	102.3	152.1	316.3
H Mainland S	207.0	379.4	474.7	485.7	802.8
H Mainland N	192.0	445.6	515.5	457.2	1,678.7
H Skye & Loch Alsh	478.0	380.0	468.7	522.5	3,340.8
H Western Isles	664.3	808.0	1,791.6	1,834.4	2,078.3
H Orkney	301.8	1,352.7	995.9	1,081.0	1,166.8
H Shetland	518.1	1,323.5	1,057.4	1,142.6	1,136.8
SC Argyll	600.0	421.9	541.0	732.1	1,008.2
SC Cowal	260.4	340.7	228.9	345.0	450.9
SC East	124.0	166.5	152.9	205.2	281.1
SC Central	194.5	261.8	427.0	252.0	329.7

Source: NAFIRS.

A = Aberdeen Area. D = Dundee Area. H = Highland Area. SC = South Caledonia Area.

11.16. While some districts, notably Dundee East and Dundee West, lost less consumer time than the national average, those covering the islands in particular lost very much more time. In part this reflects the way in which the statistics are compiled. A fault in the islands is quite likely to affect all consumers in the area while in a more urban district a fault may only affect a few, but the time lost is averaged across all consumers in the district.

### Customer complaints

11.17. The North Board applies strict guidelines for the definition of a consumer complaint. In general a complaint is only treated as such if the North Board has failed to respond in some way. For example, if a customer queries an account this is not treated as a complaint. However, if the North Board agrees to amend the account and then fails to do so or makes another mistake, subsequent action by the customer is treated as a complaint. Similarly if a customer reports loss of supply, this is not treated as a complaint, but if the consumer later alleges undue delay in restoring supply this is treated as a complaint.

11.18. All complaints are investigated by the Consumer Adviser and the results of the investigation assessed by management to establish whether or not the complaint was justified. All complaints are recorded and an analysis produced showing the number of complaints by subject and whether justified or unfounded. The statistics are maintained by each of the four Areas, the Aberdeen Accounting Centre and for the North Board as a whole. A summary of complaints over the period 1980 to 1984 is at Appendix 11.2.

### **Treatment of debtors**

11.19. The North Board's procedures for collecting revenue from its customers are described in Chapter 5. Tables 5.12 to 5.14 summarise the changing position in relation to debts over the years 1979-80 to 1984-85. During the year 1982-83 a revised Code of Practice came into effect in the ESI. It requires Area Boards to offer customers in arrears with payments a variety of repayment arrangements in order to clear the arrears. The intention of the revised Code is to make disconnection from the electricity supply a measure of last resort. The North Board responded fully to this change and substantially revised its procedures in close collaboration with the EECNSD.

### **Electricity Consultative Council for the North of Scotland District**

11.20 The EECNSD represents the interests of the North Board's consumers. The constitution, proceedings and functions of the Council are laid down by the Electricity (Scotland) Act 1979<sup>1</sup>. There are at present 27 members of the Council including the Chairman who is appointed and paid by the Secretary of State for Scotland and who is also an unpaid member of the Board. The Council employs a small staff. Recently it moved its office from Edinburgh, outside the North Board's territory, to Perth which is inside the North Board's territory.

11.21. The Council has five Area Committees, three of which relate directly to the North Board's Areas and two of which (Northern and North Caledonian) relate to the North Board's Highland Area. The Chairman and Deputy Chairman of the Council are ex-officio members of all five Area Committees.

11.22. The Council takes particular interest in those activities of the North Board such as tariffs, meter-reading and account collecting practices, consumer services and the provision of supply which have a direct impact on the consumer. It also takes a continuing interest in more strategic issues including the refurbishment programme. The Council produces an annual report summarising work during the year and including statistics on the number of consumer representations received. The Chairman's report noted that the number of representations received did not give rise to concern about the North Board. We invited the Council to submit evidence to us and this evidence is included in the summary of evidence in Annex 1 to our report.

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<sup>1</sup>Electricity (Scotland) Act 1979, Schedule 7.

## **Conclusions**

11.23. The security of supply standards applied by the North Board broadly follow those set by the CEGB and the Electricity Council and are generally more stringent than those applicable when much of the North Board's transmission and distribution system was constructed 30 or more years ago. The North Board is developing a procedure for assessing different levels of security of supply on the basis of valuing the variations in loss of supply to customers that would result. We regard this as a very useful development and hope that the North Board will continue with this work.

11.24. From the detailed statistics maintained through NAFIRS it is clear that, in terms of both the number and duration of supply interruptions per connected consumer, the North Board's performance has been consistently worse than the national average over the last 20 years. Furthermore, the position has become worse over the last five years. We accept that in part this reflects the special nature of the North Board's territory with a number of sparsely populated districts entailing a greater length of line per consumer than the national average and more extensive use of spur lines. Nevertheless, the worsening position in the last five years also indicates a decline in the state of the system (see Chapter 9). However, we have been impressed by the evidence we have received in relation to the great efforts made by the North Board to restore supply at times of major failure, as in recent winters.

11.25. The North Board receives relatively few complaints from its customers. We are satisfied that the arrangements for dealing with complaints are effective and appropriate.