



**TRANSMISSION  
SERVICES  
INCENTIVES  
SCHEME**

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PROPOSALS

FEBRUARY 1998

# **TRANSMISSION SERVICES INCENTIVES SCHEME**

## **PROPOSALS**

### **CONTENTS**

	<b>Page</b>
<b>FOREWORD</b>	1
1 <b>INTRODUCTION</b>	2
2 <b>FORM, SCOPE AND DURATION</b>	3
3 <b>TRANSMISSION SERVICES UPLIFT</b>	8
4 <b>RESPONSE AND RESERVE COSTS</b>	11
5 <b>CONSTRAINT COSTS</b>	13
6 <b>BLACK START</b>	15
7 <b>OTHER COSTS</b>	17
8 <b>OPERATING COSTS AND CAPITAL EXPENDITURE</b>	18
9 <b>PARAMETERS OF THE TRANSMISSION SERVICES INCENTIVE SCHEME</b>	22
10 <b>REACTIVE POWER</b>	26
11 <b>CHARGING ARRANGEMENTS</b>	28
12 <b>SUMMARY OF PROPOSED NEW ARRANGEMENTS</b>	30
<b>ANNEX:     List of respondents to the Transmission Services Incentives Scheme Consultation Paper December 1997</b>	32

## **FOREWORD**

This document sets out my proposals to the National Grid Company (NGC) on the revised incentive arrangements to apply on Transmission Services Uplift and Reactive Power Uplift from 1 April 1998.

A consultation paper published in December 1997 set out the issues to be considered in revising the arrangements. Some 30 responses were received. Except for three confidential responses, these have been put in the public domain by being placed in the OFFER library.

During the course of the review, NGC submitted a detailed document setting out its views on the issues, as well as responding to the consultation paper. NGC and OFFER have also met to discuss the issues. I have considered both NGC's views and respondents' views in formulating proposals

This document sets out my proposals and explains the conclusions reached. If NGC accepts the proposals, licence modifications will be drawn up and published in order that the proposed arrangements take effect from 1 April 1998. If NGC does not accept the proposals, I would expect to refer the matter to the Monopolies and Mergers Commission. I have asked NGC to let me know by 26 February 1998 whether these proposals are acceptable.

**PROFESSOR S C LITTLECHILD**  
**Director General of Electricity Supply**

**February 1998**

**INTRODUCTION**

- 1.1 In December 1997 the Director General issued a consultation paper describing the Transmission Services Uplift and Reactive Power Uplift incentive arrangements for NGC and invited views on the arrangements to take effect from 1 April 1998. Some 30 parties responded to the consultation. The Director General has considered these responses carefully, and held further discussions with NGC
- 1.2 This document sets out the Director General's proposals for the scope, duration, form and other parameters of the revised incentive arrangements. If NGC accepts the proposals, formal modifications to the transmission licence will be published towards the end of February 1998 to take effect from 1 April 1998.

## **2 FORM, SCOPE AND DURATION**

### **Form of the control**

- 2.1 Successive incentive arrangements applied to NGC's management of Transmission Services have taken a sliding scale form. The consultation paper raised the question whether this should continue.

#### **NGC's views**

- 2.2 NGC supported a correctly applied incentive-based control. It said that its monopoly role in the procurement and operation of Transmission Services requires that regulation provides a surrogate for a competitive environment. NGC needs to take a strategic approach to the management of Transmission Services Uplift. The present sliding scale arrangements enable liabilities and responsibilities of the control to be recognised and shared where appropriate.

#### **Respondents' views**

- 2.3 Most respondents favoured the continuation of the present form of control, although one generator argued that an RPI - X form of control would manage customers' risks more effectively, provide greater transparency and give better incentives than a sliding scale control.

### **Discussion**

- 2.4 The sliding scale form recognises both the element of unpredictability in Uplift costs and the extent to which NGC can influence these costs.
- 2.5 The factors which led to the choice of the present form of control remain unchanged, at least for Transmission Services Uplift. There seems no reason at present to consider that this form is unsatisfactory or that a better form is available. Changes to the form of the control for Reactive Power Uplift would be premature until the market in reactive power has been in operation for a time. These considerations point to a continued use of sliding scale arrangements for both Transmission Services Uplift and Reactive Power Uplift.

### **Scope**

- 2.6 The present control on Transport Uplift is split into two separate components covering Transmission Services Uplift and Reactive Power Uplift. NGC is now required by its licence to manage the costs of these two elements. The consultation

paper raised the question whether the prospective arrangements for a market in reactive power from April 1998 necessitated continued incentive arrangements in respect of Reactive Power Uplift

### **NGC's views**

- 2.7 NGC argued that it is becoming increasingly difficult to separate the management of its Transmission Business from its management of Transmission Services Uplift. It would prefer the company's price control arrangements to integrate the management of Transmission Services with the operation of the Transmission Business. Nevertheless, it recognised that there is a need for the incentive arrangements to be kept separate from the company's other price control, for the time being at least. In the longer term the company saw merit in the controls for Transmission Services being integrated with the main transmission price control.

### **Respondents' views**

- 2.8 Most parties argued for the revised control to continue to apply to Transmission Services Uplift and Reactive Power Uplift. One generator suggested that greater efficiency could be gained by having one combined control for both elements.

### **Discussion**

- 2.9 No arguments have been put forward for the arrangements not continuing to cover Transmission Services Uplift. Possible integration with NGC's transmission price control can be considered when that control is due for review.
- 2.10 Pool members and NGC are in the latter stages of finalising arrangements for a market in reactive power to take effect from 1 April 1998. Some uncertainty remains about how the market will operate. It is appropriate to continue the incentive arrangements on Reactive Power Uplift for the present time.
- 2.11 NGC's licence obligations in respect of the management of Transport Uplift should therefore continue to apply to both Transmission Services Uplift and Reactive Power Uplift.

### **Income adjusting events**

- 2.12 The consultation paper noted that the incentive arrangements contained provisions to allow for income adjusting events. Broadly, such events are those over which NGC has no control and which have a material effect on Transmission Services Uplift of greater than £2 million

## **NGC's views**

- 2.13 NGC suggested that an element of potential costs to Transmission Services Uplift should be removed from the incentive control. This element is the cost to the Transmission Services Uplift that arises when NGC has to carry out work on the transmission system on behalf of third parties who are not authorised electricity operators.
- 2.14 NGC has recently suggested an addition to the list of income adjusting events to address the possibility of delays in creating the contractual mechanism to give effect to the market in reactive power.

## **Respondents' views**

- 2.15 Some respondents suggested that the list of income adjusting events should be extended to reflect some uncertainties now existing in the generation market that may have effects on the level of Transmission Services Uplift. Three generators and a REC suggested that the list of events should be shorter and that the terms of NGC's licence should enable the Director General or other parties as well as NGC to identify when an income adjusting event had taken place. Several RECs suggested that there was no case to extend the list of income adjusting events.

## **Discussion**

- 2.16 The licence condition allows NGC to make proposals to vary the list of approved income adjusting events at any time.
- 2.17 Customers should not have to pay for any increase in the level of Transmission Services Uplift as a result of NGC carrying out works on the transmission system for a third party. NGC should recover such costs from the third party, and so it is not appropriate to treat such costs as income adjusting events.
- 2.18 It will be reasonable to consider NGC's request regarding the introduction of the reactive power market.

## **Duration**

- 2.19 The previous incentive arrangements on NGC's management of the costs of Transport Uplift have been of 12 months' duration.



## **NGC's views**

- 2.20 NGC argued for a one year control on Reactive Power Uplift, and for a three year incentive arrangement on Transmission Services Uplift, in order to integrate the arrangements into the company's strategic business plans. It argued that most, if not all, of the measures that it could now take to maintain a low level of Transmission Services Uplift required some investment,
- 2.21 It said that, increasingly, such investment would have payback periods in excess of one year, and without arrangements that were longer than one year its incentives to carry out the work would be diluted. It commented that the legal and regulatory framework already existed to accommodate a control longer than one year and that relatively little work was required by OFFER and NGC to extend the duration of the control. It also argued that the effect of developments in the generation market on NGC's main capital expenditure programme would be similar for the company's main price control and the restriction on Transmission Services Uplift. Despite this, a one year control applied to the latter activity whilst the main control lasted for four years.

## **Respondents' views**

- 2.22 Replies from respondents were almost equally divided on duration. One group favoured an extension of the present one year control, with one party arguing that there was no inherent link between the duration and the adequacy of the incentives. The other group suggested that a longer control might enable NGC to manage Transmission Services Uplift better, particularly in the light of NGC's views about the need to invest to gain paybacks over periods longer than one year. Of this group, a few parties suggested that a three year control might be appropriate, but most said that two years would be better in present circumstances.

## **Discussion**

- 2.23 The consultation paper noted the continuing uncertainty about uplift levels in the light of the continuing changes in generation patterns associated with new entry, the possible impact of a decision on the North Yorkshire Line and the review of trading arrangements. To this should now be added the possible impact of the review of energy sources for power stations announced last December by the Secretary of State. In addition, OFFER's consultants have not been convinced of NGC's case for further capital expenditure to reduce Transmission Services Uplift as discussed in Chapter 8 below. These factors argue against a long duration for the control
- 2.24 On the other hand, there is merit in setting the incentive arrangements for a longer period than one year where this can be done without compromising the target levels

or the sharing parameters. On this basis, an extension to two years would be warranted at this time.

- 2.25 A default arrangement should apply for a third year should a revised arrangement for that year not be agreed between NGC and OFFER. The default target for the year 2000/01 for Transmission Services Uplift should be the mid point between the level of the target for 1999/2000 and the actual level of those costs for the year 1999/2000. The default target for the second year for Reactive Power Uplift should be the mid point between the level of the target for 1998/99 and the actual level of those costs for the year 1998/99.

### **3 TRANSMISSION SERVICES UPLIFT**

- 3.1 Tables 1 a and 1 b set out the cost of each element of Transmission Services Uplift for the last four years. Tables 2a and 2b present a comparison of the year to date figures for 1996/97 and 1997/98. The consultation document explained and discussed three of these elements, namely response and reserve, constraints, and Black Start.

#### **NGC's methodology**

- 3.2 NGC has provided forecasts of Transmission Services Uplift over the next three years. In reaching its forecasts, NGC used a probabilistic method as described in Annex B of the December 1997 consultation paper. NGC identified five main generation background scenarios and about 20 issue specific sub-scenarios. Forecast ranges for Transmission Services Uplift costs were estimated for each year using Monte Carlo simulation techniques. References in this paper to NGC's forecasts are generally references to its median forecast, that is, the forecast for which NGC assigns a 50 per cent chance that the outturn value will exceed it, and a 50 per cent chance that the outturn value will be below it.

**Table la: COMPONENTS OF TRANSPORT UPLIFT**

£ million (nominal prices)	1993/94	1994/95	1995/96	1996/97
Operating margin (AS) <sup>1</sup>	63.9	55.5	59.0	56.2
Standing reserve (AS + 00)	21.8	14.4	13.3	12.9
Response and Reserve (00) <sup>2</sup>	<u>49.5</u>	<u>42.7</u>	<u>38.6</u>	<u>61.5</u>
RESPONSE AND RESERVE	135.2	112.6	110.9	130.6
HV CONSTRAINTS	184.3	143.3	73.4	57.5
LV CONSTRAINTS	70.3	50.6	0.0	0.0
BLACK START	3.1	5.2	5.4	5.9
OTHER COSTS	43.5	36.2	49.3	45.8
<b>TOTAL TRANSPORT UPLIFT</b>	<b>436.4</b>	<b>347.9</b>	<b>239.0</b>	<b>239.8</b>

<sup>1</sup> AS indicates costs that flow through Ancillary Services.

<sup>2</sup> 00 indicates Operational Outturn costs, that is, costs that flow through the Pool

**Table lb: COMPONENTS OF TRANSPORT UPLIFT**

£ million (1996/97 prices)	1993/94	1994/95	1995/96	1996/97
Operating margin (AS) <sup>1</sup>	69.4	58.7	60.4	56.2
Standing reserve (AS + 00)	23.7	15.2	13.6	12.9
Response and Reserve (00) <sup>2</sup>	<u>53.8</u>	<u>45.1</u>	<u>39.6</u>	<u>61.5</u>
RESPONSE AND RESERVE	146.9	119.0	113.6	130.6
HV CONSTRAINTS	200.2	151.5	75.2	57.5
LV CONSTRAINTS	76.4	53.5	0.0	0.0
BLACK START	3.4	5.5	5.5	5.9
OTHER COSTS	47.3	38.3	50.5	45.8
<b>TOTAL TRANSPORT UPLIFT</b>	<b>474.2</b>	<b>367.8</b>	<b>244.8</b>	<b>239.8</b>

<sup>1</sup> AS indicates costs that flow through Ancillary Services.

<sup>2</sup> 00 indicates Operational Outturn costs, that is, costs that flow through the Pool

**Table 2a: COMPARISON OF YEAR TO DATE TRANSPORT UPLIFT**

£ million (nominal prices)	Apr 96 - Dec 96	Apr 97 - Dec 97
Operating margin (AS) <sup>1</sup>	40.4	31.4
Standing reserve (AS + 00)	10.5	13.2
Response and Reserve (00) <sup>2</sup>	<u>46.3</u>	<u>48.2</u>
RESPONSE AND RESERVE	97.2	92.8
 HV CONSTRAINTS	 45.2	 20.2
 LV CONSTRAINTS	 0.0	 0.0
 BLACK START	 4.0	 4.1
 OTHER COSTS	 29.1	 35.0
 TOTAL TRANSPORT UPLIFT	 <hr/> 175.5	 <hr/> 152.1

<sup>1</sup> AS indicates costs that flow through Ancillary Services.

<sup>2</sup> 00 indicates Operational Outturn costs, that is, costs that flow through the Pool.

**Table 2b: COMPARISON OF YEAR TO DATE TRANSPORT UPLIFT**

£ million (1996/97 prices)	Apr 96 - Dec 96	Apr 97 - Dec 97
Operating margin (AS) <sup>1</sup>	40.4	30.4
Standing reserve (AS + 00)	10.5	12.8
Response and Reserve (00) <sup>2</sup>	<u>46.3</u>	<u>46.7</u>
RESPONSE AND RESERVE	97.2	89.9
 HV CONSTRAINTS	 45.2	 19.6
 LV CONSTRAINTS	 0.0	 0.0
 BLACK START	 4.0	 4.0
 OTHER COSTS	 29.1	 33.9
 TOTAL TRANSPORT UPLIFT	 <hr/> 175.5	 <hr/> 147.4

<sup>1</sup> AS indicates costs that flow through Ancillary Services.

<sup>2</sup> 00 indicates Operational Outturn costs, that is, costs that flow through the Pool.

## 4 RESPONSE AND RESERVE COSTS

- 4.1 Response and reserve costs are incurred in continuously matching generation with demand in order to maintain system frequency between 49.5 and 50.5 Hz.
- 4.2 Response and reserve costs are the single most important element of Transmission Services Uplift. They have accounted for an increasing proportion of Transmission Services Uplift as a whole, as other components, notably constraint costs, have fallen. In 1993/94, response and reserve costs were £135 million, in 1994/95 and 1995/96 they fell to just over £110 million but in 1996/97 they increased to about £130 million. As a proportion of Transmission Services Uplift they have increased from about 30 per cent in 1993/94 to about 46 per cent in 1995/96 and nearly 55 per cent in 1996/97.
- 4.3 The consultation paper set out a number of factors that influence response and reserve costs. The price that NGC strikes with generators and others in Ancillary Services contracts for the provision of response and reserve has an important bearing on outturn costs. In addition, NGC can to some extent influence the volume of frequency response and reserve held. The bidding behaviour of generators, itself influenced by generation market developments, also affects outturn costs through the operational outturn component of Uplift.

### NGC's views

- 4.4 NGC said that in forecasting response and reserve costs, it considered a number of influencing factors. It said that one important driver of costs was the bidding behaviour of generators, which was in turn influenced by developments in the generation market. NGC therefore adopted a probabilistic approach to forecasting based on a range of generation market developments. For example, one possible scenario was that Pool prices would become more variable, reflecting an increased difference between bid prices. This would have the effect of increasing the operational outturn component of response and reserve costs.
- 4.5 In addition, NGC suggested that the prices that it struck for contracts for the provision of response and reserve would broadly remain stable in real terms. It argued that a likely increase in the number of embedded generators, and a probable reduced ability of these and certain other generators to respond to system frequency changes, might result in the need to hold additional response capacity, thereby increasing costs. It also argued that the high proportion of gas fired generation meant that the system was vulnerable to interruptions in gas supply, necessitating the holding of additional reserve, again increasing costs. NGC also identified some factors that would help contain or reduce response and reserve costs, such as the possibility of a fall in Pool prices.

- 4.6 In the light of these considerations, NGC projected that median response and reserve costs would increase to about £142 million in 1998/99, then fall to about £131 million in each of the two following years (all figures in 1996/97 prices).

### **Respondents' views**

- 4.7 One REC and two Consumer Committee representatives expressed the view that NGC should continue to identify and unbundle the costs of Transmission Services Uplift further and/or make these costs more transparent. The REC noted that it was difficult to comment on the path of the elements of Transmission Services Uplift because of insufficient transparency in the figures. The two Consumer Committee representatives suggested that constraint costs were likely to continue to fall, and that the capacity of embedded generation was likely to increase, so that response and reserve costs would become an increasingly important part of Transmission Services Uplift.
- 4.8 One academic called for NGC to continue to widen its yearly round of auctions for certain ancillary services, and to make greater efforts to aggregate sets of demand side management, which could provide useful amounts of demand reduction.
- 4.9 Another REC suggested that it was worthwhile investigating whether some performance standards associated with transmission services could be reduced without compromising the performance of the network. The respondent suggested that such reductions might reduce costs

### **Discussion**

- 4.10 NGC suggested that its prices for contracts for response and reserve, which were important contributors to total costs, would broadly remain stable in real terms but that certain other factors would cause response and reserve costs to increase over the next two years. These factors were possible developments in the generation market, and, to a lesser extent, amongst other things, a likely increase in the number of embedded generators, and the possibility of an increasing capacity of gas-fired generation. Yet many of these factors have obtained over the last few years. Despite this, response and reserve costs, with the exception of an increase in Pool based response and reserve costs in 1996/97, have steadily decreased over this period.
- 4.11 Alternative modelling assumptions to those made by NGC would give lower estimates of response and reserve costs. There seems to be no reason to accept NGC's pessimistic median estimate of an increase in response and reserve costs. A reduction on the level forecast by NGC seems a more reasonable basis for setting the target level in the revised incentive arrangements.

## 5 CONSTRAINT COSTS

- 5.1 Transmission constraints on the National Grid prevent the despatch of generation plant that would yield lowest generation cost. Constraint costs are the costs of compensating plant that is constrained on or off the system
- 5.2 Constraint costs were until recently the major component of Transport Uplift. But they have fallen significantly, from over £250 million in 1993/94 to under £60 million in 1996/97. In 1993/94 they formed over half of Transport Uplift costs. By 1996/97, the ratio had fallen to just under one quarter, even though Transport Uplift itself has nearly halved. This is in part due to the elimination of LV constraints. Even excluding LV constraints, HV constraint costs were in 1996/97 one third of their level in 1993/94.

### NGC's views

- 5.3 NGC said that its forecast of constraint costs, like its forecast of response and reserve costs, reflected its views on a range of possible generation market developments. These developments were likely to affect generator bidding behaviour and hence both the volume and average cost of constraints. NGC also suggested, amongst other things, that there was a possibility of reduced availability of plant in the south of the country in future years. This would, in the absence of other effects, require the constraining-on of other southern plant in order to meet demand in the south, and therefore increase constraint costs. NGC said that generators might have an incentive to bid in such a way that constrained on payments were maximised, and the extent to which they were able to do this would increase constraint costs. NGC also suggested that other developments such as certain patterns of bidding or a fall in Pool prices, might slightly reduce constraint costs.
- 5.4 In the light of these factors, NGC forecast a reduction in constraint costs in 1998/99, with increases thereafter. Its median forecast for constraint costs in 1998/99 was about £27 million, rising to about £34 million in 2000/01 (all figures in 1996/97 prices)

### Respondents' views

- 5.5 One REC and two Consumer Committee representatives suggested that constraint costs were likely to fall because greater competition in the generation market would lead to lower bid prices, or would reduce the opportunities for generators to exploit constraints in a strategic way. Another REC suggested that there were a number of favourable factors that would tend to reduce constraint costs, such as the location of new CCGT plant in the south of the country. This respondent argued that, in



order to be able to comment fully on the issue, there should be greater transparency in constraint costs.

- 5.6 One organisation representing large customers suggested that constraint costs could be reduced by a revised charging structure. Giving NGC responsibility for paying constrained off costs would give NGC stronger incentives to improve transmission system efficiency.

## Discussion

- 5.7 NGC has in the past been able to strike constraint contracts with generators to mitigate the effects of reduced availability. It is not clear why this should not continue.
- 5.8 NGC's forecasts of future constraint costs are sensitive to its assumptions concerning possible developments in the generation market. For example, NGC assumed it relatively likely that the merit order slope would become steeper in 1998/99, which in its model would tend to increase constraint costs. An alternative assumption that the slope was less likely to become steeper would lead to a lower estimate of future constraint costs. It is not clear why there should be a significant change in generators' bidding behaviour so as to increase the merit order slope to increase constraint costs in other ways.
- 5.9 In the light of experience, NGC continues to make changes to its operation and maintenance policies so as to reduce constraint costs. There seems no reason why this should not continue, albeit perhaps at a decreasing rate now that constraint costs themselves are lower. In setting the incentive arrangements, it seems reasonable to assume constraint costs below NGC's estimate for **1998/99**.

## 6 BLACK START

- 6.1 In order to re-energise the system in the event of a system-wide or partial system blackout, some generators have the capability of restarting without taking power from the National Grid. NGC co-ordinates and contracts with generators to provide this Black Start capability. The costs of these contracts depend on the prices and nature of service that generators provide.
- 6.2 In 1993/94, Black Start costs were about £3 million. They accounted for less than 1 per cent of Transport Uplift costs. By 1996/97, these costs had risen to nearly £6 million, and the proportion to 2.5 per cent.

### NGC's views

- 6.3 NGC forecast that costs would increase in the near future before tailing off. Its mean estimate of costs was about £14 million per year from 1997/98 to 1999/00, falling to about £12 million in 2000/01 (all figures in 1996/97 prices).
- 6.4 NGC explained that the Grid Code places certain obligations on generators to provide a Black Start service. NGC also entered into Ancillary Service contracts with some generators for the provision of additional Black Start capability. NGC's Black Start recovery policy was based on a combination of geographically diverse power stations providing Black Start capabilities.
- 6.5 NGC argued that the Grid Code did not set out clearly the level of such service. In addition, many of the older power stations which traditionally provided such services were less willing or able to offer an appropriate Black Start service.
- 6.6 NGC had therefore begun to explore the possibility of contracting with other generators. It said that such contracts would specify more clearly the obligations and remuneration in respect of the provision of Black Start. Contracts could be awarded so as to preserve geographical and fuel source diversity. NGC argued that the overall effect of such contracts would be to preserve or enhance its ability to restart the system.
- 6.7 In order for some generators to provide a Black Start facility, it might be necessary for the generator to install additional equipment, NGC argued that the Black Start contract terms would need to reflect the costs of installing such equipment, and that such costs tend to be recovered in the early stages of the contract.
- 6.8 NGC said that it had signed new contracts with a number of generators, and was in negotiation with a number of others. It projected an increase in Black Start costs that was in large measure accounted for by the new signed and unsigned contracts.

## Respondents' views

- 6.9 One REC expressed concern that the cost of Black Start had almost doubled from 1993/94 to 1996/97 and said that this issue should be addressed.

## Discussion

- 6.10 It seems appropriate to make some allowance for the capital costs of installing Black Start capability in contracts with new plant. The costs of new contracts may therefore be higher than the costs of obtaining Black Start capability from older vesting plant, where such allowance may not have been necessary or appropriate in the circumstances.
- 6.11 However, NGC's previous forecasts of Black Start costs have been unduly pessimistic. For example, in February 1996, NGC forecast that costs for 1996/97 would be £9.9 million. The outturn level was £5.8 million. NGC explained that the difference was due to delays in signing and paying for Black Start contracts in that year.
- 6.12 There is equally some doubt whether new contracts will be signed this year and in the future at the rate that NGC projects. For example, NGC recently estimated that costs would be about £14 million for 1997/98, yet Table 2 shows that costs in the first nine months were about the same as for the corresponding period of 1996/97, when total costs were only about £6 million.
- 6.13 In view of the need to contract for additional Black Start facilities, but also to reflect NGC's previous over-forecasts of these costs, it seems reasonable to allow some increase on expected 1997/98 costs, but not to the extent that NGC has projected. It seems appropriate to make some allowance for the capital costs of installing Black Start capability in contracts with new plant. The costs of new contracts may therefore be higher than the costs of obtaining Black Start capability from older vesting plant, where such allowance may not have been necessary or appropriate in the circumstances

## 7 OTHER COSTS

- 7.1 There are a number of other costs associated with Transmission Services Uplift. These include 'interaction' costs, overgeneration costs, ancillary services indirect costs, and small miscellaneous payments to generators. The most significant of these are 'interaction' costs which in 1996/97 were £45.4 million. They accounted for about 19 per cent of Transmission Services Uplift and nearly 100 per cent of 'other costs'.
- 7.2 NGC has difficulty in precisely disaggregating the Transport element of operational outturn into constraint costs, response and reserve costs, and overgeneration costs. NGC estimates the first two components using specialised software which simulates plant despatch, and defines the third component algebraically. Interaction costs are the residual of Transport Operational Outturn less these three terms.
- 7.3 Ancillary services indirect costs and small miscellaneous payments to generators were just under £7 million in 1996/97. Overgeneration costs, which tend to be negative, were of the same order of magnitude, and so the remainder of the other costs for 1996/97, apart from interaction costs, summed to approximately zero.

### NGC's views

- 7.4 NGC said that it did not expect interaction costs to vary significantly in the future, and forecast a level of £39 million to £54 million in each of the next three years (all figures in 1996/97 prices).

### Discussion

- 7.5 'Other' costs are approximately equal to interaction costs which are defined as a residual component of Transport Operational Outturn. It would not be desirable to encourage any increase in an unexplained residual cost. It seems reasonable to base the incentive arrangements on a level of interaction costs, and hence of all 'other' costs, at the lower end of the range put forward by NGC.

**Operating costs and charging system upgrade**

**NGC's views**

- 8.1 NGC said that it had been able to influence the costs of Transmission Services Uplift in a number of ways. For example, it had been able to reduce the cost of constraints by identifying particular generator outages and by operating or maintaining the transmission network in such a way that the impact of the outage on constraint costs was minimised. It said that such actions might involve additional operating costs.
- 8.2 NGC proposed that, over the next three years, additional allowance for operating costs of £6 million per year be made in any revised incentives. It argued that this expenditure would provide for additional staff resource and information technology for the explicit purpose of managing the costs of Transmission Services Uplift, Some of the information technology developments would help it to model constraint costs better, evaluate capital expenditure plans for the reduction of constraint costs, and manage reactive power costs.
- 8.3 NGC suggested that the introduction of supply competition in 1998 would necessitate changes to the administration of its system for charging Transmission Services Uplift to its customers, and hence to higher annual running costs. It estimated the initial costs at £1.5 million, with additional ongoing costs of £0.5 million per year. NGC argued that these costs were not allowed for in its main transmission price control, whereas RECs were to be allowed to recover analogous costs through revised supply price controls, NGC therefore considered that the revision of the incentive arrangements was an opportunity for it to be allowed to recover these costs from customers.

**Respondents' views**

- 8.4 Some PESs favoured allowing NGC some additional operating expenditure if it were to lead to reductions in Transmission Services Uplift. One REC suggested that, if the management of Uplift were set up as a separate business unit of NGC, it would be appropriate to fund operating expenditure from revenues accruing to the business. Another REC said that any such allowance should be clearly identified as additional expenditure to that allowed under the main transmission price control, and should be reduced such that NGC paid for a portion of these costs. The REC said that the portion should reflect the proportion of the gains below target that NGC received under any new incentive arrangements. One PES argued that any allowance should be reviewed annually to assess the relative costs and benefits.

- 8.5 Other respondents, including some RECs, Consumer Committee representatives, and some generating companies, expressed reservations concerning the allowance of such expenditure. Two Consumer Committee representatives suggested that the incentives already inherent in any revised arrangements would be sufficient to encourage NGC to undertake the appropriate expenditure. One second tier supplier argued that NGC had put forward little explicit justification for such additional allowances. One PES expressed concern that any additional allowance for operating expenditure in respect of reactive power would negate any savings that might be made.
- 8.6 One generating company suggested that some operating costs and allowances in respect of costs of the introduction of supply competition were properly dealt with in the main transmission price control. Two Consumer Committee representatives said that such costs, if demonstrable, should be allowed

## **Discussion**

- 8.7 NGC had an opportunity during the course of the main transmission price control review to put forward projections regarding costs for the revision of charging arrangements associated with supply competition. It gave no indication that such costs might arise, although it was aware that revised administrative arrangements would be needed for the introduction of supply competition. Furthermore, the additional allowances recently agreed for the RECs are mainly in respect of new metering arrangements and associated data systems, NGC's proposed revised arrangements are not of this kind nor are the prospective costs likely to have a similar impact on the company's business. They are not associated with the costs of managing Uplift directly. It is therefore not appropriate to make additional allowances in respect of revised supply competition charging arrangements.
- 8.8 Operating costs in respect of the transmission system were allowed for in setting the main transmission price control. On that basis many items included in NGC's claims for the additional operating expenditure would in any case have been pursued by the company. The incentive arrangements in respect of Transmission Services Uplift also provide remuneration to NGC in the event that the target level is beaten, However it seems reasonable to acknowledge a prospective increase in operating expenditure as the target tightens, for example in monitoring, management and software development. An allowance of £1 million is proposed for such costs, spread equally over the two years of the control.

## **Capital expenditure**

### **NGC's views**

- 8.9 NGC argued for an additional allowance for capital expenditure of £27 million over the next three years. The extra charge to customers would be about £0.7 million in the first year, rising to about £2 million by the third year and continuing at this level for about 40 years thereafter. NGC suggested that such expenditure would be for additional works not required to meet licence conditions, and the advancement or enhancement of works required to meet licence conditions.
- 8.10 It said that such expenditure would be outweighed by the probable reduction in Transmission Services Uplift costs. For example, NGC calculated that schemes brought forward might save £25 million per year in constraint costs, compared to a present value of the cost of bringing forward these schemes of approximately £7 million. It said that in the absence of such expenditure, significant constraint costs might accrue from the year 2001/02. In addition, it said that this expenditure could not have been foreseen as cost beneficial at the time of the main transmission price control review, and so was clearly an additional item to the capital expenditure allowed for at that time

### **Respondents' views**

- 8.11 Some PESSs, two Consumer Committee representatives and one academic suggested that there was some merit in allowing additional expenditure to maximise benefits to customers. Some argued that additional capital expenditure was only relevant in the context of a control of greater than one year duration. One REC suggested that such expenditure should be clearly in addition to that already allowed in the main transmission price control, and should be reduced in a proportion equal to the sharing factor in any revised incentive schemes
- 8.12 One REC argued that if an allowance for capital expenditure were to be made, the process for justifying it should be transparent, and any savings demonstrable.
- 8.13 Other RECs and generators expressed concerns that capital expenditure plans put forward by NGC may already have been remunerated under the main transmission price control. Some of these respondents and others including a second tier supplier said that NGC's plans appeared unconvincing or insufficiently justified. Two RECs argued that capital expenditure which reduced Transmission Services Uplift would already be remunerated under the terms of an appropriate incentive scheme, and so this lessened the case for explicit additional allowance.

## Discussion

- 8.14 Additional capital expenditure on the transmission network might have the benefit of relieving particular network constraints. This could result in lower transmission constraint costs, or reduce the need for, and hence the cost of, response and reserve requirements. Such capital expenditure would be in addition to that needed by NGC to meet its licence conditions in respect of the security of the network. Alternatively, the additional capital expenditure could take the form of bringing forward or enhancing schemes required to meet licence conditions.
- 8.15 During the main transmission price control review, NGC argued that additional capital expenditure for the purposes of relieving constraints would be more than offset by the saving in constraint costs. Following advice from OFFER's technical consultants, £12 million of capital expenditure was allowed for in each of the years 1997/98 and 1998/99
- 8.16 Subsequently, OFFER's consultants reviewed NGC's present proposals for capital expenditure. They reported that some allowance had already been made in NGC's main price control for costs associated with bringing forward planned capital expenditure. The majority of NGC's present proposed capital expenditure fell into this category of costs. They identified other specific projects proposed by NGC as being cost-effective. These totalled £0.6 million over the next two years. In the light of this, it seems appropriate to make an additional allowance of this amount for capital expenditure on those specific projects.



## **9 PARAMETERS OF THE TRANSMISSION SERVICES INCENTIVE SCHEME**

- 9.1** The December 1997 consultation paper described the present and previous incentive arrangements. All have been of a similar form in that they specify a target level of outturn; percentage sharing factors for outturns above or below this level; and a range over which sharing factors apply, defined by limits on NGC's gains and losses: the so-called "caps and collars".
- 9.2** The present incentive arrangements have a target of £240 million for Transmission Services Uplift, with NGC's sharing factors being 30 per cent for outturns below the target (i.e. gains) and 15 per cent for outturns above the target (i.e. losses). NGC's gains or losses are capped at £15 million, giving a range of Transmission Services Uplift over which the incentives apply of £190 million to £340 million.

### **NGC's views**

- 9.3** NGC argued that the risk profile for Transmission Services Uplift outturn was now asymmetric and so the likelihood of Transmission Services Uplift costs increasing was greater than that of it decreasing. It said that there was accordingly less scope for it to reduce Transmission Services Uplift. It also argued that any gains it made in one year should be consolidated for future years and that progressively tightening the targets did not allow the company to realise in successive years the rewards made in earlier years. NGC suggested that forecasts based on extrapolation of past events were not appropriate because of the changing nature of factors that affect the market.
- 9.4** Aggregating its estimates discussed in previous sections, NGC forecast a median outturn of £229 million for Transmission Services Uplift in 1998/99, falling to £223 million in 1999/00 and then rising to £227 million for 2000/01 (all figures in 1996/97 prices). It suggested that its sharing factor for outturns below the target (i.e. for gains) should be increased from 30 per cent to around 50 per cent or more and that its sharing factor for outturns above the target (i.e. for losses) should be decreased to less than the present 15 per cent. For the revised capping arrangements NGC argued for the restoration of the target that applied to the incentive arrangements for 1994/95 giving a maximum gain of £28 million (that is the original target of £25 million expressed in 1997/98 prices), and for its maximum loss to remain at £15 million

### **Respondents' views**

- 9.5** Respondents generally supported a modest reduction in the target figure. A few argued that the target should be left unchanged and one REC argued for a reduction to below £200 million. Two RECs argued that, as the latest supply price control

had been calculated on certain assumptions about the level of Transmission Services use of system charges, revised targets for the Transmission Services incentives scheme might also require a review of the supply price control.

- 9.6 Views on the sharing factors were about evenly spread between those wishing to see the present arrangements continue and those favouring change. One group argued that the present arrangements provided adequate rewards for NGC. On the other hand, another group suggested that increased sharing factors for gains might be appropriate. One REC suggested that incremental sharing factors for gains would reflect the progressive difficulty of realising paybacks on NGC's investments.

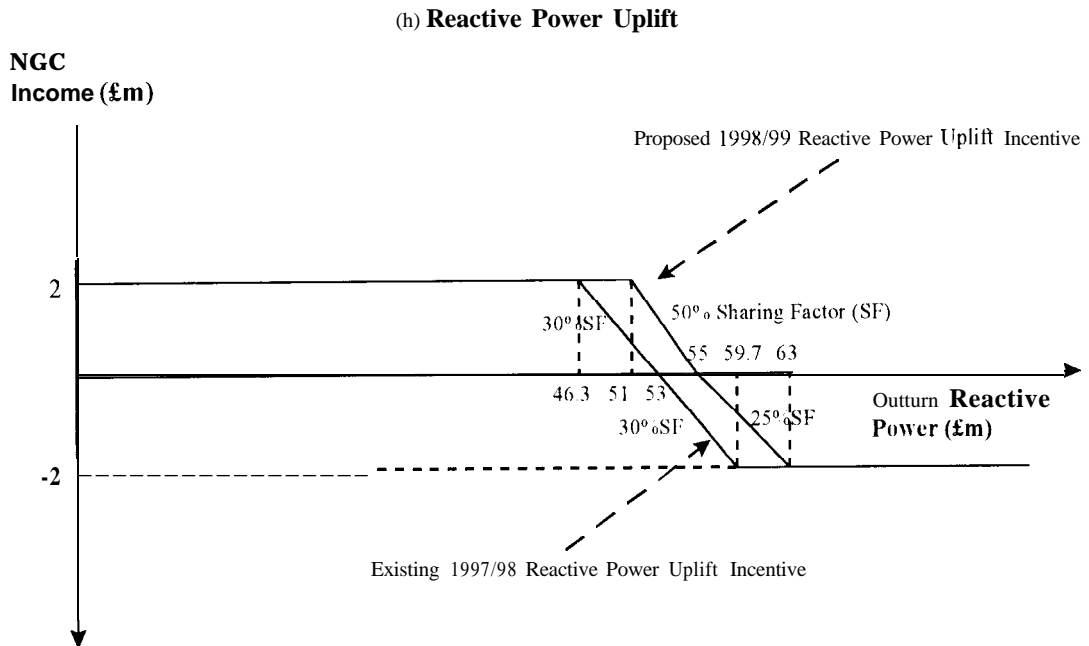
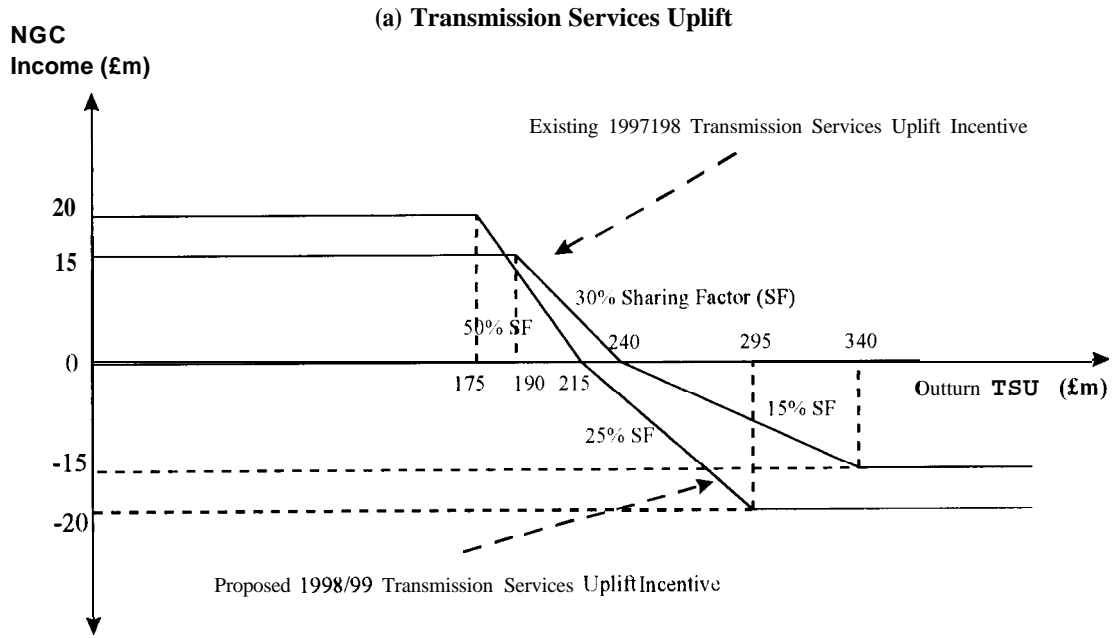
## **Discussion**

- 9.7 Table 1 b shows that the outturn of transport uplift has decreased from £474 million in 1993/94 to £245 million in 1995/96 and £240 million in 1996/97 (all figures in 1996/97 prices). NGC has forecast a median outturn of £217 million (in 1996/97 prices) for 1998/99. This is based on assumptions about the future path of various factors that drive the levels of transport uplift. However, applying different assumptions leads to different ranges of predicted levels.
- 9.8 NGC has previously overestimated transport uplift. For instance, in 1994/95 the outturn was of the order of £100 million lower than NGC's forecast.
- 9.9 In March 1996, NGC forecast transport uplift for 1997/98 to be £350 million. In October 1997, NGC revised its forecasts of the outturn for that year down to £224 million. The company has recently indicated that the outturn may be lower still, in the range £209 million to £214 million, subject to additional Black Start costs. If the total for the year 1997/98 has the same relationship to the first nine months as it did in 1996/97 (see Table 2), the outturn would be at the middle to upper end of this range, (Figures in this paragraph in 1997/98 prices.)
- 9.10 NGC has been successful in reducing transport uplift in the past, and it seems plausible that it will be increasingly difficult to reduce it at the same rate in future. There is also the possibility of unexpected developments which might influence uplift. However, NGC's arguments that these will tend to increase uplift are not convincing, as discussed earlier, and its previous over forecasts of uplift tend to undermine its present forecasts. The allowances for some additional operating and capital expenditure over a two year period should enable NGC to invest and plan and continue to reduce uplift in real terms albeit at a decreasing rate
- 9.11 On this basis, it seems reasonable to set the target at about the same level, in real terms, as the upper end of NGC's latest projection of transport uplift for 1997/98, namely £215 million, and at the lower level of £205 million for 1999/00. (These figures are in 1997/98 prices, They need to be uprated by inflation.) Targets at these

levels will provide NGC with a positive remuneration if it holds uplift constant in real terms, and the prospect of greater remuneration for improved performance to the benefit of customers.

- 9.12 As regards sharing factors, there is some merit in the argument that as Transmission Services Uplift is reduced it becomes progressively harder to achieve further reductions, and that the incentive to achieve such reductions should therefore be increased. At the same time, NGC is acquiring greater experience of securing reductions, and should be less vulnerable to risks of higher uplift. These considerations suggest that incentives should be increased, but this should be done by increasing commensurately the sharing factors for both gains and losses. It is therefore proposed to increase both the sharing factors, and to set them at 50 per cent for outturns below the target (i.e. for gains) and 25 per cent for outturns above (i.e. for losses).
- 9.13 The “caps and collars” limit the risk to NGC of large variances from the target, But they also limit its incentive to reduce uplift outside that range. In view of the greater experience in containing uplift, there is a case for increasing the present caps and collars from £15 million to £20 million, Under the proposed arrangements NGC’s gain will be 50 per cent of the difference between £215 million and an outturn lower than that. Its maximum gain of £20 million will be achieved at an outturn at or below £175 million. Similarly, NGC’s loss will be calculated as 25 per cent of the difference between £215 million and an outturn higher than that. Its maximum loss will be incurred at an outturn at or above £295 million. The range over which the incentive arrangements will apply is thus from £175 million to £295 million. The proposed incentive arrangements, compared with the present arrangements, are shown graphically in Figure 1 (a).

**Figure 1**  
Existing and Proposed 1998/99 Incentive Arrangements



## **10 REACTIVE POWER**

10.1 NGC and Pool members are presently making preparations for a market in reactive power to take effect from 1 April 1998. NGC has already received tenders from providers of reactive power. The results of the tendering exercise will be announced shortly.

### **NGC's views**

10.2 Payments for reactive power have been subject to annual indexation. NGC said that its forecast for reactive power for 1998/99 of £55 million was based on indexing by RPI the anticipated monies payable under the tariff mechanism for reactive power for 1997/98. It suggested that the target of £53 million in 1997/98 should be similarly updated. The company argued that there are certain interactions between the management of Transmission Services Uplift and Reactive Power Uplift. Therefore, it suggested that in order to avoid perverse incentives between the management of either cost, the incentive arrangement for Reactive Power Uplift should have similar sharing factors to those it proposed should apply to Transmission Services Uplift.

### **Respondents' views**

10.3 In general most respondents supported the approach taken by NGC on reactive power. Some parties said that there would be scope for the incentives to be incorporated into NGC's main price control at a later date. Two parties argued that NGC's own equipment which provided reactive power should be included in the market arrangements.

### **Discussion and conclusions**

10.4 NGC's efforts are presently concentrated on establishing the reactive power market. NGC should then bring forward proposals on whether and how its own equipment that provides reactive power could participate in the market arrangements

10.5 Arguments for increased sharing factors for the control on Reactive Power Uplift have some merit. The sharing factors should be consistent with those that apply to Transmission Services Uplift to avoid creating perverse incentives on NGC's management of reactive power and Transmission Services Uplift.

10.6 Although the reactive power market arrangements will be different to the present arrangements in some respects, NGC should still be able to manage the costs of reactive power effectively. The proposed incentive arrangements will last for a

year. The arrangements should be reviewed before new ones are put in place for 1999/2000, if appropriate.

- 10.7 NGC has argued that the target for its incentive arrangements for Reactive Power Uplift should continue to be updated by RPI as in previous years. Tenders submitted by generators under the reactive power market arrangements will not come into force until the beginning of 1998/99. Given that the market is at an early stage in its development there is merit in indexing by RPI the target of £53 million for 1997/98 for Reactive Power Uplift to give a target of £55 million for the forthcoming year.
- 10.8 The proposed incentive arrangements for Reactive Power Uplift are illustrated in Figure 1 (b).

## **11 CHARGING ARRANGEMENTS**

- 11.1 The consultation paper set out a number of areas where there may be scope for NGC to develop the present charging arrangements so as to introduce greater cost reflectivity and thereby to sharpen incentives to reduce costs or to provide services valued by others

### **NGC's views**

- 11.2 NGC pointed out that the forthcoming review of trading arrangements could potentially have an impact on the nature and level of different uplift components. It suggested that the trading arrangements review was a more appropriate vehicle for reviewing the charging arrangements for Transmission Services Uplift than the present review.

### **Respondents' views**

- 11.3 Those Consumers' Committees who responded generally favoured more cost reflective charges. They recognised that incentive structures could be improved if NGC could move away from uniform charging for Transmission Services Uplift. A generator suggested that uplift costs should reflect cost differences between locations by introducing regional scaling factors to those elements of Transmission Services Uplift which vary by location.
- 11.4 A REC argued that it was not clear that NGC's demand customers had any real opportunity to achieve cost reductions for their contribution to Transmission Services Uplift and that, where appropriate, cost reflective measures should apply to generators as well. An industrial customer argued that Transmission Services Uplift should be calculated on the same basis as Transmission Network use of system charges, that is on demand at times of peak demand.
- 11.5 One REC suggested that careful analysis to maintain economic efficiency would need to underpin a move towards more cost reflective charging. Another PES suggested that the costs of developing in the charging arrangements could, in some cases, outweigh the benefits that could be obtained
- 11.6 One REC and some other parties argued that the charging structure should remain as it is at present.

### **Discussion**

- 11.7 NGC's present charging arrangements are based on those previously adopted within the Pool. They do not involve fully cost-reflective charges being made to customers.

- 11.8 In accordance with its contractual obligations to signatories of the Master Connection and Use of System Agreement, NGC has already issued its draft supplemental agreements that will apply in 1998/99. It would be difficult for NGC to change its charging structure in time for 1 April 1998.
- 11.9 There are presently some elements of Transmission Services Uplift where potential exists for NGC to introduce greater cost reflectivity in its charges in future - for instance, for HV constraints, and for LV constraints should the latter re-emerge, and for response and reserve.
- 11.10 Another potential area for cost-reflective charging is for reactive power. NGC's proposals for a reactive power market recognise that reactive power production and usage vary by location. NGC has identified zones for capability and utilisation of reactive power that reflect by area the differing needs for reactive power. If NGC were to develop the present basis of charging customers for reactive power, which is on an uniform flat basis, to one that better reflected those customers' reactive power requirements, this would sharpen incentives on the owners of distribution networks to reduce their reactive power requirements.
- 11.11 The Director General is asking NGC to consider the possibilities for, and the implications of, introducing more cost-reflective charging structures.



## 12 SUMMARY OF PROPOSED NEW ARRANGEMENTS

### **Scope and Form**

- 12.1 NGC's licence obligations in respect of the management of Transport Uplift should continue to apply to both Transmission Services Uplift and Reactive Power Uplift. The use of sliding scale arrangements for both Transmission Services Uplift and Reactive Power Uplift continues to be appropriate.

### **Transmission Services Uplift**

- 12.2 The proposed incentive arrangements for Transmission Services Uplift should apply for two years.
- 12.3 The targets should be £2 15 million for 1998/99 and £205 million for 1999/00, both figures expressed in 1997/98 prices.
- 12.4 The sharing factors for Transmission Services Uplift should be 50 per cent for outturns below the target and 25 per cent for outturns above.
- 12.5 The "caps and collars" should be £20 million, so that the range over which the incentive arrangements will apply will be £175 million to £295 million.
- 12.6 A default arrangement should apply for a third year should a revised arrangement for that year not be agreed by NGC and OFFER. The default target for the year 2000/01 for Transmission Services Uplift should be the mid point between the level of the target for 1999/2000 and the actual level of those costs for the year 1999/2000.

### **Reactive power**

- 12.7 The form of the present incentive arrangements for Reactive Power Uplift should continue for another year. The target for payments by NGC for reactive power should continue to be uprated by RPI as in previous years to give a figure of £55 million in 1998/99 prices. The sharing factors for gains should be increased to 50 per cent and for losses reduced to 25 per cent.
- 12.8 A default arrangement should apply for a second year should a revised arrangement for that year not be agreed by NGC and OFFER. The default target for Reactive Power Uplift should be the mid point between the level of the target for 1998/99 and the actual level of those costs for the year 1998/99.

## **Licence modifications**

- 12.9** If NGC accepts the proposals, which are summarised above, formal modifications to the transmission licence will be published towards the end of February 1998 to take effect from 1 April 1998.

## ANNEX

### LIST OF RESPONDENTS TO THE TRANSMISSION SERVICES INCENTIVES SCHEME CONSULTATION PAPER DECEMBER 1997

#### NGC

##### Public Electricity Suppliers

Eastern Electricity  
East Midlands Electricity\*  
London Electricity  
Midlands Electricity  
NORWEB\*  
Scottish Power  
Scottish Hydro-Electnc  
SEEBOARD  
Southern Electric  
South Wales Electricity  
South Western Electricity  
Yorkshire Electricity

##### Electricity Consumers' Committees

Chairmen's Group  
East Midlands  
Midlands  
Southern  
Yorkshire

##### Other respondents

Association of Electricity Producers  
BOC Gases  
British Gas Trading  
British Steel plc\*  
Dr Cory, Imperial College, London  
Mr Dutta  
Energy Intensive Users Group  
Enron Gas Trading Ltd  
First Hydro  
National Power  
Nuclear Electric  
PowerGen

\* Confidential responses