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**Initial Proposals for NGC's System
Operator Incentive Scheme under NETA
A Consultation Document and Proposed
Licence Modifications**

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Executive Summary

This document considers the role of the National Grid Company plc (NGC) and its incentives under the new electricity trading arrangements (NETA). The document examines NGC's role as system operator (SO) in matching generation and demand (energy balancing) and maintaining the quality and security of supplies (system balancing). In the context of these roles, and NGC's forecast of the costs of balancing the system, Ofgem has developed initial proposals for an SO incentive scheme at the start of NETA.

NGC's Role as SO

Ofgem has reached conclusions on a number of areas associated with procurement and utilisation of balancing services:

- ◆ for the start of NETA, to avoid unnecessary risks to system security, participants will continue to have the same obligations regarding the mandatory provision of balancing services as they do now in respect of Ancillary Services. We have also confirmed that implementation of a frequency response market should be delayed until after the start of NETA;
- ◆ NGC will be given discretion in procuring balancing services, including allowing it to trade energy forward for the purpose of operating the system subject to new licence obligations that balance this discretion and a new SO incentive scheme;
- ◆ NGC will not be charged imbalance prices for any energy imbalances resulting from its forward trading of energy. In relation to NGC selling back products into the Balancing Mechanism, Ofgem continues to believe that this should be a matter for the commercial arrangements between NGC and service providers;
- ◆ Ofgem acknowledges that in the absence of new transmission access and pricing arrangements at the start of NETA, participants who are forced into energy imbalance as a result of transmission failures will be exposed to imbalance charges at the start of NETA. We are continuing to consider ways in which this issue could be addressed;

- ◆ reserve and forward energy contracts will be considered as energy balancing services and the costs of such contracts will be included in the calculation of energy imbalance prices; and
- ◆ a tagging methodology has been developed that will go some way towards removing system balancing costs from energy imbalance prices. Ofgem proposes that this methodology should be adopted for the start of NETA.

Initial SO Incentive Scheme under NETA

Ofgem has also reached conclusions on the form, scope and duration of the initial SO incentive scheme under NETA, building on the successes of the existing incentive schemes that have led to consistent reductions in the costs of system operation.

- ◆ the initial SO incentive scheme under NETA will cover all energy and system balancing costs including reactive power and transmission losses, subject to reducing NGC's exposure to the Net Imbalance Volume at a reference price;
- ◆ there will be one bundled incentive scheme whose target will be based on an ex-ante forecast of total balancing costs; and
- ◆ the initial SO incentive scheme will continue to take a sliding scale form and it will last from the introduction of NETA to 31 March 2002.¹

Draft modifications have been proposed to NGC's Transmission Licence in order to give effect to Ofgem's conclusions on the form, scope and duration of the initial SO incentive scheme under NETA, and these are presented in Appendix 6.

Ofgem believes that there is strong merit in introducing a split between the recovery and incentivisation of Transmission Asset Owner (TO) costs and the recovery and incentivisation of SO costs. Thus, the final proposals for NGC's price control, due to be published in mid-September will relate only to the TO function. NGC's SO internal costs will be reviewed as part of a separate SO Price Review and initial proposals relating to this will also be published in September 2000 with a view to including them as part of the SO incentive scheme from April 2001.

¹ The initial SO incentive scheme on NGC must be in place for the introduction of NETA. As details of the new transmission access and pricing arrangements become clear, we will be in a position to consult on the form, scope and duration (and parameters) of the enduring SO incentive scheme under NETA that will encompass the new transmission access and pricing arrangements.

In this document, we present initial proposals on the parameters of the initial SO incentive scheme under NETA and views are invited on the initial proposals. NGC has proposed an incentive scheme target of £1.56 million/day or £774 million per year for the duration of the initial SO incentive scheme under NETA. Across the whole of the incentive scheme, Ofgem suggest that the incentive scheme target (including losses) could be lower than NGC's proposal by between 11% and 30% from around £774 million to between £545 million and £692 million (corresponding to a 10-23% reduction for the period to 31 March 2001 and a 11-32% reduction thereafter).

Further consideration needs to be given to the precise level of the sharing factors for the initial SO incentive scheme under NETA. Ofgem believes that it might be appropriate to halve the exposure faced by NGC under its current licence based incentive schemes and proposes that a sharing factor of between 10% and 30% should be considered. Ofgem also continues to believe that symmetric sharing factors and symmetric caps and collars are appropriate. Ofgem believes that a cap/collar of between £25 million and £50 million (on an annualised basis) for incentive scheme payments over the course of a year should be considered for the initial SO incentive scheme under NETA. Ofgem remains committed to aligning NGC's interests with that of customers and over time we expect to be able to agree a higher sharing factor and wider cap/collar.

Ofgem is not convinced that the reference price used to reduce NGC's exposure to the Net Imbalance Volume should be linked only to energy imbalance prices (as suggested by NGC). Ofgem believes further consideration should be given to this issue, but has an initial preference for a reference price that combines a floating price approach with a cap and collar set to System Buy Price and System Sell Price respectively.

We propose that NGC should be allowed to recover approximately £3.9 million of its NETA related costs and £2.2 million² in Ancillary Services Overheads and Transmission Services (TS) incremental costs that are not recovered under the current scheme during the period from the introduction of NETA to 31 March 2001. However, this in no way commits Ofgem to agreement on the overall level of NETA related costs NGC should be allowed to recover.

Ofgem has decided, with general support from the industry, proposals to introduce for the start of NETA an interim regime for the allocation and pricing of transmission losses.

² Assuming a Go Live date around the middle of November 2000.

Under the transitional regime, actual losses will be used to adjust the metered volumes of production and consumption on a 45:55 basis before energy imbalances are calculated. This will incentivise participants to adapt their contractual positions to reflect their expected allocation of losses.

1. Introduction

The Purpose of this Document

- 1.1 The New Electricity Trading Arrangements (NETA) are due to be implemented in England and Wales in Autumn 2000. In December 1999, Ofgem issued a consultation document (the 'December Consultation')³ setting out our thinking on a number of areas related to the roles of, and incentives on, the National Grid Company plc (NGC) as both System Operator (SO) and Transmission Asset Owner (TO) under NETA. In April 2000, Ofgem published a further consultation document (the 'April Consultation')⁴ that set out, amongst other things, Ofgem's views on the role and activities of NGC under NETA, including our initial thoughts on initial incentives for NGC as SO and the basis on which NGC should recover the costs of balancing the system under NETA through a Balancing Services Use of System (BSUoS) charge.
- 1.2 The initial SO incentive scheme on NGC must be in place for the start of NETA. The purpose of this document is to present Ofgem's initial proposals on the initial SO incentive scheme under NETA and the proposed draft licence modifications⁵ required to implement the new incentive arrangements. The document also presents Ofgem's conclusions on the treatment of transmission losses at the start of NETA.
- 1.3 In early September 2000, Ofgem will be publishing a further consultation on new transmission access and pricing arrangements under NETA and other longer term developments. Following publication of this document, we will begin an industry wide consultation, led by NGC, to develop detailed proposals for new transmission access arrangements. New transmission access and pricing arrangements will have strong interactions with the development of the new NGC Price Control.

³ 'NGC System Operator Incentives, Transmission Access and Losses under NETA, A Consultation Document', Ofgem, December 1999.

⁴ 'NGC System Operations under NETA: transitional arrangements, A Consultation document', Ofgem, April 2000.

⁵ This will include further modifications to parts 1 and 2 of LC 4A.

- 1.4 Subject to designation by the Secretary of State, Ofgem expects the new Connection and Use of System Code (CUSC) to be in place by the turn of the year. The CUSC will be the main vehicle through which new transmission access and pricing arrangements will be implemented. As details of the new transmission access and pricing arrangements become clear, we will also be in a position to consult on the form, scope and duration (and parameters) of the enduring SO incentive scheme under NETA, that will encompass the new transmission access and pricing arrangements.

The Process to Date

Current Role of and Incentives on NGC as System Operator

- 1.5 NGC currently uses a combination of Ancillary Services⁶ contracts, despatching generators and demand-side bidders on the basis of the offers that they submit into the Pool and utilisation of its own specialist equipment to maintain the system in balance. The types of services that NGC procures as SO can be divided into two broad categories:
- ◆ energy balancing - the activities of the SO in matching overall supply and demand at a half-hourly level; and
 - ◆ system balancing – the activities of the SO in achieving the stable and secure operation of the transmission system.
- 1.6 There are presently four separate incentive schemes on NGC as SO. Those covering Energy Uplift (the costs of energy balancing in the Pool) and transmission losses (based upon a target volume of losses at a fixed price) are negotiated between suppliers and NGC via the electricity Pool. The incentive schemes covering Transmission Services Uplift (TSU)⁷ and Reactive Power Uplift

⁶ Ancillary services are essential services required for security and stability of supply. The four main ancillary services consist of reactive power, reserve, frequency response and black start capability. In addition, NGC has, on occasion, signed ancillary service contracts to assist in the alleviation of constraints. It also has contracts for emergency assistance from the French and Scottish transmission systems.

⁷ The TSU scheme covers the costs incurred by NGC in procuring and utilising services required to ensure security and stability of supply, including reserve, frequency response and the costs of resolving transmission constraints.

(RPU)⁸ are governed by the current condition 4A of NGC's Transmission Licence.

- 1.7 In February 2000, Ofgem published our final proposals on the target cost levels for incentive arrangements for NGC covering the TSU scheme and the RPU scheme from 1 April 2000.⁹ For 2000/01, Ofgem and NGC have agreed a reduction of £20 million in the target cost level for TSU to £201.2 million, and a reduction of around £0.5 million in the target for RPU to £46.5 million. The current incentive schemes have been designed to run from April 2000 to April 2001, with part-year termination arrangements which will be used to wind-up these schemes when NETA is implemented and a new incentive scheme introduced.
- 1.8 Suppliers have negotiated new incentive schemes with NGC on Energy Uplift and transmission losses, covering a similar duration, via the Pool. Suppliers and NGC have agreed a small number of changes to the parameters of the Energy Uplift and transmission losses incentive schemes. These schemes will automatically cease when NETA is implemented.
- 1.9 The current SO incentive schemes have been successful in incentivising NGC to achieve year on year reductions in the costs of balancing the system. Over the last seven years the costs of operating the transmission system (excluding the costs of Unscheduled Availability) have fallen in real terms from a peak of £680 million in 1993/94 to £208 million in 1999/00 (April 2000 prices). This has been to the benefit of customers. The initial incentive scheme on NGC under NETA will aim to build on these successes.

The Role of NGC as SO under the New Electricity Trading Arrangements

- 1.10 One of the basic principles of NETA is that those wishing to buy and sell electricity should be able to enter freely negotiated contracts to do so. It is expected that under the new trading arrangements, the bulk of electricity will be traded on one or more power exchanges and through a variety of bilateral contracts. Those buying and selling electricity on exchanges and through

⁸ The RPU scheme covers the costs incurred by NGC in procuring reactive power, which is needed to ensure that the voltage of the system remains within safe limits prescribed by legislation.

⁹ 'NGC Incentive Schemes from April 2000. Transmission Services Uplift and Reactive Power Uplift Schemes: A Decision Document'. February 2000.

bilateral contracts are likely to include not only generators and suppliers (who produce or whose customers consume physical quantities of electricity), but non-physical traders as well. The new arrangements will not dictate how electricity will be bought and sold on these exchanges or in bilateral contracts. They will however provide a Balancing Mechanism to help facilitate real time balancing of the transmission system by NGC, as SO, to maintain security and stability of supply, and a settlement process to settle differences (imbalances) between the contractual and physical positions of those producing and consuming electricity.

- 1.11 The detailed rules associated with these arrangements are contained in the Balancing and Settlement Code (BSC).¹⁰
- 1.12 Detailed proposals for implementing NETA, particularly relating to the Balancing Mechanism and imbalance settlement process, were outlined in Ofgem's consultation document¹¹ published in July 1999 (the 'July 1999 NETA Document'). This was followed by a conclusions document in October 1999¹² (the 'October 1999 NETA Document') published jointly by Ofgem and the Department of Trade and Industry (DTI).
- 1.13 In the July 1999 NETA Document, Ofgem presented some initial thinking on the role of, and incentives on, NGC as SO and the development of new transmission access and pricing arrangements under NETA. The October 1999 NETA Document discussed respondents' views on the thinking outlined in the July 1999 NETA Document but left a detailed discussion of transmission and incentive related issues to a separate consultation process to be conducted by Ofgem.
- 1.14 Under NETA, a range of options will be available to the SO for system balancing, including the despatching of plant by accepting Balancing Mechanism bids and offers and by exercising contracts for balancing services from generation and demand purchased in advance. Some of the balancing services purchased under contract will be similar to the current Ancillary

¹⁰ The final draft of the BSC was published on 31 July 2000. Details can be found on the Ofgem NETA website. On 14th August 2000, the designated 'Go Active' date, existing licencees, Pool members and other companies who want to participate in NETA signed the BSC, licence changes to take effect at Go Active and on the introduction of NETA and the Implementation Scheme.

¹¹ 'The new electricity trading arrangements, Volume 1', Ofgem, July 1999.

¹² 'The new electricity trading arrangements, Ofgem/DTI Conclusions Document', October 1999.

Services purchased by NGC. In purchasing a range of balancing services,¹³ NGC will be obliged under a new licence condition to operate the electricity transmission system in an efficient, economical and co-ordinated manner (licence condition 7B(1)).¹⁴

The December Consultation

- 1.15 In the December Consultation, Ofgem suggested that NGC should be given discretion in both the procurement and utilisation of balancing services, subject to an appropriate incentive scheme being in place. A further safeguard would be provided by obliging NGC to prepare Procurement Guidelines and Balancing Principles. Ofgem also argued that, in general, the process of procuring and utilising balancing services should be both transparent and competitive. Ofgem argued that as more market based arrangements for the procurement of balancing services emerged, participants should no longer face an obligation to provide certain mandatory balancing services. Instead, participants should be able to contract with others to meet minimum service levels.
- 1.16 Ofgem's view on charges for balancing services costs was that the costs of providing balancing services should be recovered from all generators and suppliers who are parties to the BSC, on the basis of their metered volumes, and that further work should be undertaken to determine whether these costs could be targeted to specific periods.
- 1.17 With regard to incentivising the SO under NETA, Ofgem proposed that there should be a single scheme covering both the energy balancing and system balancing costs incurred by NGC in operating the system. We indicated that it should continue to be of a sliding scale or profit sharing form, and our preliminary view was that consideration should be given to the incentivised costs being based on a target volume of services and a reference price emerging from forward markets. Ofgem considered that this approach would allow NGC, as SO, to take appropriate balancing actions across all of its activities.

¹³ The term "balancing services" is used to cover both services purchased in the Balancing Mechanism and services contracted outside the Balancing Mechanism.

¹⁴ See 'The New Electricity Trading Arrangements, Proposed Licence Conditions', Ofgem/DTI Conclusions Paper, June 2000.

April 2000 Consultation

1.18 Ofgem's April Consultation document considered further NGC's SO role in energy and system balancing and the tools that NGC will use, under NETA, to fulfil its SO role. The April Consultation explained why Ofgem believes that NGC, as SO, should be allowed discretion in the way in which it balances the system under NETA, in order that it can control and reduce the costs of system operation that are ultimately borne by customers, subject to:

- ◆ the publication of Procurement Guidelines and Balancing Principles;
- ◆ a new SO incentive scheme under NETA; and
- ◆ a new licence obligation on NGC, to operate the transmission system in an efficient, economic and co-ordinated manner (licence condition 7B(1)).

1.19 Ofgem's views on the form, scope and duration of a new incentive scheme for NGC under NETA were also set out in the April Consultation. Currently suppliers bear the vast majority of the costs of system operation and transmission losses. Under NETA, all participants who are out of energy balance (between their contract position and their physical metered position) will pay an energy imbalance charge. The document outlined a proposal for including, in energy imbalance prices, the balancing services contract costs incurred by NGC in balancing the system.¹⁵ Ofgem also argued that it would not be reasonable to impose system balancing costs on those who were out of energy balance and a simple method for removing at least some of these system balancing costs was proposed. Finally, Ofgem confirmed its view that costs incurred by NGC in balancing the system should be borne equally by generators and suppliers.¹⁶

Balancing Services Use of System (BSUoS) Charge

1.20 Under the current arrangements most of the costs of energy balancing and system balancing, including the costs of Ancillary Service contracts, are

¹⁵ Although energy balancing contract costs are included in imbalance charges as a charging signal they are not recovered via them since the net revenues (or costs) from imbalance payments are smeared back across all participants.

¹⁶ This was first suggested in the July 1999 NETA document and reiterated in the October 1999 NETA documents.

recovered from suppliers through a Transmission Services Use of System (TSUoS) charge. Under NETA, the BSUoS charge, levied on all BSC parties with metered volumes, will allow NGC to recover its balancing costs and will replace the current TSUoS arrangements.

- 1.21 In July 2000, Ofgem/DTI issued a conclusions document¹⁷ ('the July 2000 BSUoS document') on the necessary licence modifications to implement the BSUoS charge. The consequential changes to the Master Connection and Use of System Agreement (MCUSA) and its Supplemental Agreements (including the proposed statement of charges for use of the Transmission System in anticipation of NETA) will form part of the NETA Implementation Scheme.¹⁸ These amendments are currently the subject of consultation between NGC and each of the relevant transmission users. The NETA Implementation Scheme will give effect to the relevant changes to the MCUSA and Supplemental Agreements as from the NETA 'Go Live' date.
- 1.22 The proposed modifications to NGC's Transmission Licence relating to the BSUoS charge will be implemented under the powers which have been given to the Secretary of State under the Utilities Act 2000 (the NETA power). Thus, the designated licence condition modification will take effect at NETA 'Go Live'. Ofgem/DTI have considered the responses to our July 2000 BSUoS document and we have consequently finalised the licence modifications to be implemented under the NETA power.¹⁹ These proposed modifications are presented in Appendix 6 together with the licence changes required to implement the new incentive scheme.

Outline of this Document

- 1.23 Chapter 2 of this document discusses the current regulatory and legal framework relating to the role of NGC as SO. Chapter 3 discusses Ofgem's conclusions on the procurement and utilisation of balancing services by NGC. Chapter 4

¹⁷ 'Balancing services use of system under NETA, Proposed modifications to the National Grid Company's licence, Ofgem/DTI conclusions document', July 2000.

¹⁸ The Implementation scheme provides an implementation plan setting out the key documents that will need to be processed to ensure that participants' liabilities resulting from the NETA implementation process are limited and that industry documentation and data are assessed in readiness for the implementation of NETA.

¹⁹ These further modifications to NGC's Transmission Licence reflecting respondents' views to the July 2000 BSUoS document will now be implemented under Section 11 of the Electricity Act (1989).

presents Ofgem's conclusions on the form and content of energy imbalance prices. Chapter 5 outlines Ofgem's proposals on the form, content and duration of the initial SO incentive scheme, whilst Chapter 6 presents Ofgem's initial view on its parameters. Finally, Chapter 7 discusses Ofgem's conclusions on the treatment of transmission losses at the start of NETA.

- 1.24 Appendix 1 contains background to the current definitions of balancing services and Appendix 2 contains the background to the current procurement of balancing services. Appendices 3, 4 and 5 contain the latest drafts of NGC's Procurement Guidelines, Balancing Principles and Balancing Services Adjustment Data methodology (BSAD methodology). Appendix 6 sets out further proposed modifications to condition 4A of NGC's Transmission Licence to implement the proposed new incentive schemes.

Related Issues

Consultation on NETA Licence Conditions

- 1.25 Building on the proposals outlined in the July 1999 and October 1999 NETA Documents, in December 1999 Ofgem published a consultation document²⁰ containing proposals on the licence changes necessary for NETA in England and Wales and related transmission issues. A further consultation document was published in February 2000,²¹ which contained draft licence conditions in the light of the views of respondents to the previous consultation. A final Ofgem/DTI conclusions document was published in June 2000.²²

Transmission Access and Pricing and the Long Term Treatment of Losses

- 1.26 In the December Consultation, Ofgem argued that new transmission access and pricing arrangements are required in England and Wales to ensure that the full benefits of NETA are realised. Ofgem suggested new transmission access and pricing arrangements based around markets in firm rights for access to the transmission system. Under such arrangements, participants would require entry

²⁰ 'The New Electricity Trading Arrangements and Related Transmission Issues – Proposals on licence changes, Ofgem/DTI Consultation Document', December 1999.

²¹ 'The New Electricity Trading Arrangements, Proposed Licence Conditions, Ofgem/DTI Consultation Document', February 2000.

²² 'The New Electricity Trading Arrangements: Proposed Licence Conditions. Ofgem/DTI Conclusions Paper', June 2000.

rights in order to be able to inject electricity into the transmission system and exit rights to withdraw electricity from it. They would face access imbalance charges for mismatches between their metered volumes and access rights. NGC would buy-back and/or sell additional transmission access rights in order to resolve transmission constraints.

1.27 Since December 1999, Ofgem has given further thought to the details of how a transmission access regime based on firm entry and exit rights might work in practice. These issues have also been discussed in seminars at the Charging Principles Forum of the Transmission Users Group (TUG-CPF) in February 2000 and June 2000 and were discussed further at the NETA Seminar in June 2000.

1.28 Ofgem held an industry workshop in August 2000 that focused on two key issues concerning the proposed transmission access arrangements: the core design issues related to choosing definitions for firm entry and exit rights and the trade-offs involved; and the systems requirements for the proposed transmission access regime. Ofgem is expecting to publish in early September a further consultation document on the new transmission access arrangements. This will be followed by a public seminar in September 2000 that will consider progress to date and will outline the way forward.

Connection and Use of System Code

1.29 The December Consultation highlighted some problems with the existing arrangements in governing connection to, and use of, NGC's transmission system. In particular, it expressed concern that the procedures for modifying the MCUSA and its Supplemental Agreements were slow and cumbersome. A second problem was the lack of clarity in relation to the resolution of disputes under the MCUSA. Ofgem/DTI proposed that the current MCUSA be replaced with a new connection and use of system code (CUSC) which would incorporate more flexible governance procedures. The CUSC would be designated by the Secretary of State using the NETA Power provided for under the Utilities Act 2000. Ofgem/DTI proposed that the CUSC would be designed to cover most transmission-related issues (connections, transmission access and use of system obligations and charges²³) and perhaps some elements of the incentive scheme

²³ It might also potentially cover Transmission losses.

on NGC as SO. In addition, the CUSC would contain generic elements of the current Supplemental Agreements in relation to connection and use of system. Site specific data and charges would form individual bilateral agreements to be agreed between NGC and the relevant party.

- 1.30 In March 2000, Ofgem/DTI published a consultation document (the March CUSC document²⁴) which set out our initial views on the content and scope of a CUSC, and the proposed changes to licence conditions that would be required to implement it. This was followed by another consultation document in June 2000 (the June CUSC document²⁵), which set the detailed legal drafting of the changes to licence conditions 10, 10A, 10B and 10C of NGC's licence, which contain provisions relating to connection and use of system.
- 1.31 In August 2000, Ofgem/DTI published a further document²⁶ (the 'August CUSC document') that summarised the responses to the March and June documents in relation to the proposed modifications to NGC's licence conditions. It set out Ofgem/DTI's proposals for the content and scope of the CUSC and the necessary changes to NGC's licence and the proposed new licence conditions for generators, Public Electricity Suppliers (PESs) and second tier suppliers. It was proposed that the CUSC licence conditions would also apply to all relevant distributors, when distribution licences are introduced in April 2001.

NGC Consultation

- 1.32 Following the publication of the August CUSC document, NGC will begin a consultation on the detailed drafting of the CUSC. Working groups composed of industry participants will be set up to look at sections of the CUSC and updated information will be available on NGC's website. NGC will be publishing a consultation document on the CUSC and an initial draft of the CUSC towards the end of August/early September. This document will invite nominations for working group attendees.

²⁴ 'NGC's Connection and Use of System Code. An Ofgem/DTI consultation on the scope and content of the Connection and Use of System Code', March 2000.

²⁵ 'Connection and use of System Code. Proposed changes to the National Grid Companies licence. A consultation document', June 2000.

²⁶ 'NGC's Connection and Use of System Code; Scope, content and liecece changes, An Ofgem/DTI Final Proposals document', August 2000.

- 1.33 It is expected that NGC will publish a Final Proposals document, with the final version of the initial CUSC and the initial version of NGC's charging methodologies and charging statements to close the consultation process, towards the end of the year.
- 1.34 Ofgem/DTI will be publishing a conclusions document towards the end of the year which will set out our final proposals for the licence conditions necessary for implementing the CUSC. The CUSC and the licence conditions will be designated by the Secretary of State using the NETA power in time for the CUSC to take effect around the turn of the year.

NGC Transmission Price Control

- 1.35 In March 2000, Ofgem published a document²⁷ that set out the form, scope and duration of the next NGC price control, which will take effect from 1 April 2001. This provided information on NGC's forecasts of its future operating and capital expenditure requirements.
- 1.36 The document also set out Ofgem's initial analysis of NGC's costs over the period of the next control, including its cost of capital. In June 2000, Ofgem published its initial proposals for the NGC Transmission Price Control.²⁸

Separation of SO and TO Roles and SO Price Control

- 1.37 NGC can be viewed as having two roles, one as system operator (SO), the other as transmission asset owner (TO). Currently, all the internal costs, i.e. both SO and TO, incurred by NGC are controlled by a single company-wide price control, with a separate incentive scheme on NGC to control external SO costs incurred to balance the system. It was on this basis that the initial proposals for the next NGC price control were calculated. However, Ofgem has previously argued that post-NETA, we would want to move towards using an RPI-X price control for the TO function alone, with all the SO costs (internal and external) included in the SO incentive scheme.

²⁷ 'The transmission price control review of the National Grid Company from 2001, Initial thoughts consultation document, Ofgem', March 2000.

²⁸ 'The transmission price control review of the National Grid company from 2001, Draft proposals, Ofgem', June 2000.

- 1.38 Ofgem believes that there is strong merit in introducing this split for the next price control. Thus, the final proposals for NGC's price control, due to be published in mid-September will relate only to the TO function. NGC's SO internal costs will be reviewed as part of a separate SO Price Review and initial proposals relating to this will also be published in September 2000 with a view to including them as part of the SO incentive scheme from April 2001.
- 1.39 Ofgem expects to be able to publish final proposals on the SO Price Review in January 2001 with a view to implementing separate arrangements for SO and TO from April 2001.

The Transco Price Control Review and Long Term Signals and Incentives for Investment in Transmission Capacity on Transco's NTS

- 1.40 It is important that, over time, the incentives on system operators in the gas and electricity markets are consistent, to ensure efficient interactions between the two markets. In May 2000, Ofgem published its initial review and proposals for improving signals and incentives for investment in BG Transco's National Transmission System (NTS). The document proposed extending the use of capacity auctions to cover longer term capacity rights based on output measures agreed as part of the next Price Control Review, subject to improved output related incentives on BG Transco, based on these output measures. Ofgem discussed these issues at a seminar on Transco's Price Control Review held on 9 August 2000. Ofgem proposes to publish more detailed proposals in light of these representations later this year. A decision document will be published early in 2001.
- 1.41 Ultimately, any proposals to implement new arrangements for the allocation of longer term capacity rights will need to be taken forward in parallel with Ofgem's work on setting the next BG Transco price control, which is scheduled to commence from April 2002. Ofgem is planning to publish an initial proposals consultation document on the price control in June 2001 with a final decision to be made in September 2001. Further information on the BG

Transco price control process can be obtained from the recent Ofgem consultation document.²⁹

The Way Forward on Incentives for NGC as SO under NETA

- 1.42 Ofgem will be considering the responses to this document prior to finalising its views on the initial SO incentives scheme under NETA. Draft changes to NGC's Transmission Licence in relation to the incentive scheme are proposed as part of this consultation. It is proposed that these modifications will be implemented under Section 11 of the Electricity Act 1989.
- 1.43 Ofgem intends to develop and publish in October 2000 final proposals and licence changes to implement a new incentive scheme on NGC. Ofgem expects the initial SO incentive scheme on NGC and the arrangements for transmission losses, discussed in this document, to remain in place until new transmission access and losses regimes are implemented. In October 2000, following our consultation on the necessary licence modifications, Ofgem will give statutory notice of those necessary modifications to NGC's Transmission Licence, which will enable the new incentive scheme to be put into place. Subject to NGC's agreement to the proposed licence modifications, the schemes will come into effect at NETA "Go Live". This is scheduled to occur between the end of October and the middle of December with a current target date of 21 November 2000.

Views Invited

- 1.44 Ofgem is seeking comments on the initial proposals outlined in this document. It would be helpful if responses could be received by 19 September 2000, addressed to:

²⁹ 'Review of Transco's price control from 2002: Initial Consultation Document, Ofgem', May 2000.

Dr Eileen Marshall CBE
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Office of Gas and Electricity Markets
Stockley House
130 Wilton Road
London SW1V 1LQ.

- 1.45 Electronic responses may be sent to: lorraine.ladbrook@ofgem.gov.uk
- 1.46 Respondents are free to mark their replies as confidential although we would prefer, as far as possible, to be able to place responses to this paper in the Ofgem library. Unless clearly marked 'confidential', responses will be published by placing them in the Ofgem library.
- 1.47 If you wish to discuss any aspect of this document, Tony Spencer (telephone: 020 7932 6330), Tolani Azeez (telephone: 020 7932 6331) or Naval Naik (telephone: 020 7932 6338) will be pleased to help.

2. The Regulatory and Legal Framework

Introduction

- 2.1 This chapter outlines both the current and anticipated legal and regulatory framework of the electricity industry. It summarises the current legislative, licensing and regulatory regimes and describes planned developments including the relationship between the Electricity Act 1989, licences and industry agreements.
- 2.2 Further details on the developments in the licensing and regulatory regime can be found in the June 2000 NETA document and the June CUSC document. The June document outlined Ofgem/DTI's conclusions on the licence conditions to introduce NETA whilst the June CUSC document outlined the proposed licence conditions required to introduce the CUSC.

The Regulatory and Legal Framework

The Legislative Framework

The Electricity Act 1989

- 2.3 The Electricity Act provides the framework for the functions of the Director General, of the consumers' committees, and for the licensing to enable the supply, generation and transmission of electricity.

The Fair Trading Act 1973

- 2.4 The Director General has concurrent powers with the Director General of Fair Trading (DGFT) under parts of the Fair Trading Act 1973 (FTA 1973). In relation to these concurrent powers, Ofgem works in conjunction with the Office of Fair Trading (OFT) under the terms of an agreement between the Director General and the DGFT. These functions relate to situations that may arise under a monopoly.

The Competition Act 1998

- 2.5 The Competition Act 1998 (which came into effect on 1 March 2000), reinforces the concurrent powers of the Director General and the DGFT. Under the new Competition Act, the Director General gains advanced powers of investigation,

and the ability to impose financial penalties of up to 10% of turnover over three years on companies infringing the prohibitions under the new Act. Chapter I of the Act prohibits anti-competitive agreements and Chapter II deals with the abuse of a dominant position.

The Utilities Act 2000

- 2.6 The Utilities Act 2000 (the Utilities Act), which received royal assent on 28 July 2000, contains a section allowing the Secretary of State to modify existing licences granted under the Electricity Act 1989, where he considers it to be necessary or expedient for the purposes of implementing or facilitating the operation of NETA. This power is exercisable within two years from the date of enactment. The Secretary of State exercised this power in August to impose the NETA licence conditions, and will exercise this power again in order to introduce the licence conditions required for the implementation of the CUSC, as a necessary part of NETA.
- 2.7 The Utilities Act introduced other reforms to the gas and electricity markets and the regulation of these markets, which are expected to take effect in the next few months. These reforms include:
- ◆ the replacement of the Director General of Electricity Supply and the Director General of Gas Supply with the Gas and Electricity Markets Authority (the Authority) to cover both the gas and electricity industries;
 - ◆ the introduction of a new principal objective (primary duty) on the Authority to protect the interests of consumers in relation to electricity conveyed by distribution systems wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the generation, transmission, distribution or supply of electricity;
 - ◆ the introduction of standard licence conditions for each type of electricity licence granted under the Electricity Act and provisions for making modifications to standard licence conditions;
 - ◆ the separation of the licensing of electricity supply and distribution;

- ◆ provision for contracts for the supply of electricity to be deemed between suppliers and small customers in certain circumstances;
- ◆ arrangements to ensure continuity of supply to small customers in the event of a supplier failing or losing its licence; and
- ◆ the creation of an additional power to enable the Authority to impose financial penalties on companies found to be in breach of their relevant licence under the Electricity Act 1989.

Licensing and Regulatory Duties

The Duties of the Director General

- 2.8 The general duties of the Director General are set out in sections 1, 3 and 47 to 50 of the Electricity Act 1989. The Director General must exercise his functions in the manner he considers is best calculated to secure that all reasonable demands for electricity are satisfied, that licence holders are able to finance their activities³⁰ and to promote competition in the generation and supply of electricity.
- 2.9 Subject to these primary duties, the Director General also has a duty to exercise his functions in the manner he considers is best calculated to protect the interests of consumers, to promote efficiency on the part of transmission and supply licence holders and in the use of electricity. In doing so, he has to take into account the effect on the environment of activities connected with the generation and supply of electricity, as well as the health and safety of those employed in the electricity industry.
- 2.10 Under section 11 of the Electricity Act, the Director General can seek to modify a licence with the licensee's consent (and after consultation). Under section 11, the Director General shall give notice:

³⁰ The actual wording given by the Electricity Act 1989 is "to secure that licence holders are able to finance the carrying on of the activities which they are authorised by their licences to carry on", Part I - section 3 para. 1(b).

- ◆ stating that he proposes to make the modifications and setting out their effect;
- ◆ stating the reasons why he proposes to make the modifications;
- ◆ specifying the period (being not less than 28 days from the date of publication of the notice) within which representations or objections to the proposed modification may be made; and
- ◆ consider any representations or objections which are duly made and not withdrawn.

2.11 If a licensee does not consent to a proposed modification, the Director General may refer the matter to the Competition Commission under section 12 of the Electricity Act 1989.

2.12 Under section 11 of the Electricity Act 1989 (as amended by the Utilities Act 2000), the Director General will be able to amend standard licence conditions. The Director General is required to give the notice referred to in paragraph 2.10. The Director General can only modify standard licence conditions if:

- ◆ no relevant licence holder objects to the modification; or
- ◆ the total number of licence holders objecting to the modification is less than a percentage to be prescribed of the total relevant licence holders and the market share of the objecting licensees is also less than a percentage to be prescribed.³¹

The Transmission Licence

2.13 Under section 9(2) of the Electricity Act 1989, NGC is obliged to develop and maintain an efficient, co-ordinated and economical system of electricity transmission and to facilitate competition in the supply and generation of electricity.

³¹ The prescribed percentages will be set out in a statutory instrument which will be laid down by the Secretary of State before Parliament. Ofgem is currently awaiting confirmation as to when the different provisions contained in the Utilities Act will take effect.

- 2.14 NGC is the sole possessor of a transmission licence in England and Wales. It owns and operates the national grid, which transports electricity at high voltage from the generators to the Public Electricity Suppliers' (PESs') local distribution networks and to customers connected directly to the transmission system. It has a further duty not to discriminate in connection to, and use of, the transmission system and interconnectors with Scotland and France.
- 2.15 NGC's transmission licence imposes a number of other obligations including duties to:
- ◆ publish a statement in a form approved by the Director General, setting out the basis upon which charges for connection and use of system will be made³² (licence Condition 10(1));
 - ◆ offer terms for connection and use of system (licence Condition 10B);
 - ◆ to operate the system within prescribed frequency and voltage limits defined in the licence (licence Condition 12) and the Grid Code; and
 - ◆ implement and comply with a Grid Code, which sets out the detailed technical aspects of connection to and the operation and use of the licensee's transmission system.
- 2.16 The Director General can settle any dispute where there has been a failure to enter into terms for connection and use of system, or at the request of NGC or any other party, where a dispute arises following a proposal by NGC to vary the existing terms for connection and use of system.
- 2.17 Condition 4A of NGC's licence sets restrictions on the revenues that NGC is allowed to earn. For these purposes, NGC's activities are split between its Transmission Network Services (TNS) and its Transmission Services Activity (TSA).³³ The TNS activities of NGC are defined in its licence as including all undertakings in the planning, development, construction and maintenance of the

³² Section 14.7 of the MCUSA places an obligation on NGC to charge in accordance with this statement.

³³Under NETA the definition of Transmission Services Activity has been modified as follows: Balancing Services Activity means the activity as part of the Transmission Business, of procuring and using Balancing Services for the purpose of balancing the licensee's transmission system.

transmission system excluding the TSA and excluded services. The TSA is currently defined in the transmission licence as activities “undertaken by the licensee as part of the transmission business in the development and operation of the licensee’s transmission system for the purpose of optimising the costs arising from the operation of that system”.

- 2.18 Part 1 of licence condition 4A provides for a price control to be set by the Director General on all revenue obtained from NGC’s TNS. The present price control on the TNS expires on 31 March 2001 and an initial consultation paper on the level of the next price control has been issued by Ofgem.³⁴
- 2.19 Part 2 of licence condition 4A currently provides for two profit sharing incentive schemes in relation to the TSA - TSU and RPU. Under NETA, the existing incentive schemes contained in the transmission licence will be modified to include those costs previously covered by incentive schemes embodied within the Pooling and Settlement Agreement (P&SA).

Other Related Documents

The Pooling and Settlement Agreement (P&SA)

- 2.20 Generators, suppliers and transmission companies are required by their licences to be party to the Pooling and Settlement Agreement. This agreement contains the rules and arrangements for the current market in wholesale electricity (the England and Wales Pool). With the introduction of NETA, there will be a Run-Off period for the P&SA, the rules regarding which are set out in the Balancing and Settlement Code (BSC). The BSC was made effective on 14 August 2000 when existing licensees, Pool members and other companies intending to participate in NETA signed the BSC framework agreement. Until the provisions relating to Run-Off as set out in the P&SA become effective, all electricity licensees will be required to continue to be party to the P&SA. Under NETA, the existing incentive schemes covered by the Pool, namely Energy Uplift and Transmission Losses, will no longer be applicable.

³⁴ ‘The Transmission Price Control Review of the National Grid Company from 2001, Draft Proposals’, June 2000.

The Master Connection and Use of System Agreement (MCUSA)

- 2.21 The MCUSA is a multi-party agreement between NGC, the PESS, second-tier suppliers, licensed generators and some non-licensed generators and a small number of customers who are directly connected to the transmission system. There are presently over 100 parties to the MCUSA.
- 2.22 The MCUSA, and its Supplemental Agreements, set out terms and conditions for connection to, and use of, the transmission system. These include payment methods, metering, modifications to the transmission system, variations to the MCUSA, compliance with the Grid Code and dispute resolution. The Director General is not a party to the MCUSA or the Supplemental Agreements. He has limited powers for resolving disputes relating to the MCUSA and can only make such determinations in relation to specific types of disputes. In respect of variations to the MCUSA, the Director General has power to determine disputes in relation to proposed variations to the MCUSA, if proposed by NGC. The MCUSA makes provision for an arbitrator to settle any disputes which relate to the interpretation of provisions contained within the MCUSA.

Supplemental Agreements

- 2.23 Parties to the MCUSA are also required to sign appropriate Supplemental Agreements. A separate Supplemental Agreement is in place between NGC and each party connected to or using the Transmission network. There are presently more than 400 such agreements in place. The Supplemental Agreements specify the equipment at each connection site and the basis for charging for that equipment.
- 2.24 Appendix E of the Supplemental Agreements sets out some of the charging rules for both connection to and use of the transmission system. It includes the provisions whereby NGC revises its charges annually. To do this, NGC is required to notify customers by 31 October in the preceding financial year of the intended basis of calculation to be used in the following financial year. NGC is required to confirm this basis of calculation by 30 November in the preceding financial year.

- 2.25 Through a schedule to the MCUSA, the Transmission Users Group (TUG) was set up to discuss changes to NGC's transmission business, which impact on the MCUSA and its Supplemental Agreements.

The Balancing and Settlement Code

- 2.26 The BSC has been published and its scope is defined in general terms in the Transmission, Generation and Supply licences. The BSC is a code maintained by NGC under a new condition in NGC's transmission licence which sets out the rules for the balancing mechanism and settlement process under NETA. It covers arrangements for:
- ◆ making, accepting and settling offers and bids to increase or decrease electricity delivered to, or taken off, the total system (NGC's transmission system and the distribution systems) to assist NGC in balancing the system; and
 - ◆ determining and settling imbalances and certain other costs associated with operating and balancing the transmission system.
- 2.27 A panel has been charged with overseeing the management, modification and implementation of the BSC rules. The Panel Chairman has been appointed by the Director General. It has representatives from the industry, consumers and NGC as well as independents. The Chairman of the BSC Panel is also the Chairman of the Balancing and Settlement Code Company (BSCCo).³⁵ The primary purpose of the BSCCo will be to provide or procure a range of operational and administrative services, both directly and through contracts with service providers, to implement the provisions of the BSC and modifications to it.
- 2.28 The details of the modification procedures are contained in Section F of the BSC. The modification procedures are designed to ensure that the process is as efficient as possible whilst ensuring that as many parties as possible can propose modifications and have the opportunity to comment on modification proposals.

³⁵ The BSCCo was named Elexon Limited on 7 June 2000.

Framework for Incentives under NETA

- 2.29 As part of developing new incentive schemes for the SO under NETA it will be necessary to consider where the new schemes should be incorporated. Under the existing arrangements, two of the incentive schemes are in NGC's licence and a further two schemes are arranged through the Pool.
- 2.30 Ofgem's initial view was that parts of the SO incentive scheme under NETA could be incorporated in the proposed CUSC or the Transmission Licence or both. Given the current timetable for implementing the new incentive scheme on NGC, Ofgem believes that the initial incentive scheme on NGC under NETA should sit within its Transmission Licence.

3. The Procurement and Utilisation of Balancing Services under NETA

Introduction

3.1 NGC currently uses a combination of Ancillary Services contracts, despatching generators and demand-side bidders on the basis of the offers submitted into the Pool and utilisation of NGC's own specialist equipment to maintain the system in balance. The types of services that NGC procures as SO can be divided into two broad categories:

- ◆ energy balancing - the activities of the SO in matching overall supply and demand at a half-hourly level; and
- ◆ system balancing – the activities of the SO in achieving the stable and secure operation of the transmission system.

3.2 Under NETA, a similar range of options will be available to the SO, including accepting Balancing Mechanism bids and offers and contracts for balancing services from generation and demand purchased in advance. Some of the balancing services purchased under contract will be similar to the current Ancillary Services purchased by NGC. In purchasing this range of balancing services,³⁶ NGC will have to be mindful of its new licence obligation to operate the electricity transmission system in an efficient, economical and co-ordinated manner.

3.3 A number of issues relating to the procurement and utilisation of balancing services were set out in our April Consultation. In this chapter, we consider these issues, namely:

- ◆ the mandatory provision of balancing services;
- ◆ the introduction of a frequency response market;

³⁶ The term "balancing services" is used to cover both services purchased in the Balancing Mechanism and services contracted outside the Balancing Mechanism.

- ◆ NGC's discretion in procuring balancing services (including the need for NGC to have energy accounts);
 - ◆ NGC's statements on Procurement Guidelines and Balancing Principles; and
 - ◆ acceptances in the Balancing Mechanism and the treatment of transmission failures.
- 3.4 The last two of these issues have been extensively consulted upon during the consultation on the BSC. After the publication of the April Consultation, Ofgem published a Policy Statement in July 2000 to facilitate this consultation process.³⁷

Background

Current Definitions and Procurement of Ancillary Services

- 3.5 Under the current arrangements, NGC is required, under Condition 6 of its current Transmission Licence, to procure sufficient "Ancillary Services" to enable it to discharge its obligations under the Electricity Act 1989 and its Transmission Licence. This requirement works in conjunction with the provision of services specified in the Grid Code and the MCUSA. The Ancillary Services Business, currently a separate business (under the Transmission Licence) within NGC, is responsible for procuring these Ancillary Services and there is an economic purchasing obligation on NGC in contracting for Ancillary Services.
- 3.6 There are two categories of Ancillary Services: System Services and Commercial Services. System Services are services that NGC requires to operate the system safely and reliably. Part 1 System Services are services that all licenced generators must be capable of providing in accordance with the terms of the Grid Code and the MCUSA.³⁸ They are restricted to specified capabilities for frequency response and reactive power. Should a generator fail to provide them, NGC has the right to refuse to connect the generator to the transmission

³⁷ 'The New Transmission Access Arrangements and Related Transmission Issues, An Ofgem Policy Statement', Ofgem July 2000.

³⁸Unlicenced generators may also provide Ancillary Services but are not obliged to under the terms of the Grid Code.

system. Part 2 System Services (such as 'black start' services) are not required from every generator and these provisions are agreed on a site by site basis. However, if NGC requests the provision of a Part 2 System Service, a participant must provide terms (technical and commercial) for its supply.

- 3.7 Commercial Services are services that are essential but not mandatory and generators can refuse to provide them. NGC makes payments for both System and Commercial Services under a variety of arrangements.
- 3.8 Ancillary Services are typically procured under bilateral contracts between NGC and individual service providers. The length of these contracts varies between one year and effectively the lifetime of the asset (for Part 1 System Services). Remuneration for the provision of the service can either be cost or value based. Initially, cost-based remuneration was considered appropriate for mandatory services. However, progress is being made towards introducing competition (particularly from the demand-side) and market-based mechanisms for procurement, thus leading to value-based remuneration.
- 3.9 Further details on the definition and current procurement of Ancillary Services can be found in Appendices 1 and 2 respectively.

Mandatory Provision of Balancing Services

Previous Consultations³⁹

- 3.10 Ofgem initially proposed in our April Consultation that, over time, and with the introduction of market based arrangements for the procurement and provision of balancing services, the obligation on all participants to provide balancing services from their own facilities should be removed. We accepted that NGC, as SO, may need to be able to rely on a minimum level of service for important services from all participants but we considered that it should be possible to set a standard of service that each participant can provide either from its own facilities or under contract from other participants.⁴⁰ Some services will clearly have important locational aspects to their delivery, and this may restrict the

³⁹ In this and subsequent sections headings, previous consultations refers to the December Consultation and the April Consultation.

⁴⁰ For example, in circumstances where such other participants were better placed to provide either a technically better or more cost effective service.

amount of trading between participants that can take place. For example, trading of minimum service levels might have to be restricted to participants within particular areas. Ofgem welcomed NGC's view that the obligations to provide Part 2 Ancillary Services could be reviewed, and urged them to begin this review as soon as is practicable. However, we accepted the argument that removing the mandatory obligation at the same time as NETA might lead to unnecessary risks being incurred in relation to the security and stability of supply.

- 3.11 Thus, Ofgem proposed that at the start of NETA, participants should continue to have the same obligations in relation to the provision of balancing services as they exist now in relation to Ancillary Services. Nonetheless, Ofgem remained committed to reviewing the need for mandatory services once NETA and new transmission access arrangements are established.

NGC's View

- 3.12 In its response to the April Consultation, NGC agreed with Ofgem that, at the start of NETA, participants should have the same obligations in relation to the provision of balancing services as they do now in relation to Ancillary Services. NGC accepts that it may be appropriate to review the obligation on parties to provide mandatory services once market arrangements for balancing services have become widely and well established. However, NGC continues to believe that some mandatory obligations will be required indefinitely to ensure that emergency conditions can be dealt with.

Other Respondents' Views

- 3.13 Seventeen respondents' to the April Consultation commented on this issue. Of these, the majority was in favour of retaining the mandatory provision of services from participants' own facilities for the start of NETA. Seven respondents were keen to see the removal of the mandatory provision of services as soon as practicable after NETA is implemented. Four respondents requested a firm timetable for progress on this matter. Many emphasised the need for market based solutions to the provision of these services.

Ofgem's Conclusions

- 3.14 Given the general support for our view, Ofgem has decided that there will be no change in the obligations on participants to provide minimum levels of balancing services from their own facilities at the start of NETA. Nonetheless, Ofgem remains committed to reviewing the need for mandatory services once NETA and new transmission access arrangements are established.

Introduction of a Frequency Response Market

- 3.15 The Reserve and Response Procurement Principles Sub-Group (R2P2) of TUG has been considering proposals for the development of a market for the procurement of frequency response services. Although a detailed market design has not yet emerged, the broad objective of moving away from cost based to value based remuneration⁴¹ and of allowing generators to meet their frequency response obligations by purchasing services (either directly or via NGC) from other participants has been agreed. In addition, the principle that service providers should be able to reflect the value of the service they provide at different times through changes in the prices they offer has also been accepted.

Previous Consultations

- 3.16 In our April Consultation, Ofgem said that we would like to see a frequency response market introduced as soon as practicable, but we have accepted that the introduction of such a market should be delayed until after the introduction of NETA, given that significant resources in the industry are currently being concentrated on the successful delivery of NETA.
- 3.17 Nevertheless, Ofgem made it clear that there is no need for the design of the proposed frequency response market to be delayed, and we looked to TUG and its sub-groups to develop a detailed design for a frequency response market based around market principles consistent with the new trading arrangements. This will facilitate the early introduction of the market.

⁴¹ Currently cost based payments cover approximately half the required level of frequency response services, with the remainder being provided through commercial arrangements that provide value based remuneration to service providers.

NGC's View

- 3.18 NGC welcomed Ofgem's acceptance that the introduction of the proposed frequency response market should be delayed until after the introduction of NETA but stated that it remains committed to the development of a frequency response market.
- 3.19 NGC also argued for an evolutionary approach to the introduction of a value-based market in frequency response. It envisaged markets opening up incrementally following the implementation of NETA. NGC is aiming to develop the detailed market principles via the TUG and its sub-groups.

Other Respondents' Views

- 3.20 Eighteen respondents to the April Consultation commented on this issue. Thirteen respondents agreed that a frequency response market should be delayed until after the implementation of NETA. Seven respondents stated that they would like to see a firm timetable for the development and implementation of a frequency response market. Five respondents were disappointed that the frequency response market will not be established for the start of NETA, with one respondent arguing that the implementation of NETA would have been aided by having the frequency response market in place.

Ofgem's Conclusions

- 3.21 Having considered the views of respondents, Ofgem remains of the view that the implementation of a market in frequency response services should be delayed until after the introduction of NETA. However, Ofgem will be looking to NGC and the industry to make substantial progress in the possible design of a frequency response market over the coming months and for the development of a timetable for the implementation of such a market, with implementation taking place under the proposed CUSC modifications process.

NGC's Discretion in Procuring Balancing Services

Previous Consultations

- 3.22 In the April Consultation Ofgem said that it is important to allow NGC discretion in the purchase of balancing services (including trading energy outside the

Balancing Mechanism) provided that appropriate safeguards are in place including that its activities are conducted in an open and transparent manner and that an appropriate incentive scheme is in place. As a result, NGC would have the incentive and ability to balance the system efficiently, to the advantage of users of the transmission system and customers. We have argued that specific rules about NGC's system operations activities would be inappropriate, but we also recognised the concerns expressed in response to previous consultations that an incentive scheme alone would not necessarily be sufficient in all circumstances to balance NGC's discretion. Consequently, Ofgem/DTI proposed that NGC should be subject to new licence conditions requiring it to operate its transmission system in an efficient, economic and co-ordinated manner and to engage in trading only for the purposes of operating the system i.e. prohibiting it from speculative trading.

3.23 In order to promote openness and transparency in the way in which NGC procures balancing services, and to provide the market with appropriate information about NGC's procurement strategy to enable the market to respond accordingly, Ofgem/DTI considered that NGC should be required to produce Procurement Guidelines and Balancing Principles (discussed below). Furthermore, Ofgem/DTI proposed that NGC should provide the market from time to time with information about the contracts it has actually concluded, ahead of Gate Closure,⁴² for the provision of balancing services.

3.24 Ofgem has argued that the effective functioning of the new trading arrangements – forwards markets (including short term power exchanges), a Balancing Mechanism to resolve imbalances and a settlement system for out of balance participants – will not be adversely affected by allowing NGC the option to purchase energy. For example, participants will benefit in terms of lower energy balancing costs if NGC is allowed to purchase energy in forwards markets rather than through the Balancing Mechanism, when it is expected to be more economic to do so.

⁴² Generators and suppliers will contract bilaterally until the Balancing Mechanism for a half-hour trading period opens and notifications of contract volumes for the period have to be made. At this point, known as "Gate Closure" market participants will have to inform NGC, as SO, of their intended generation or consumption profiles for the relevant half-hour. Initially this will occur 3 ½ hours before the start of a half-hour trading period.

- 3.25 To help address the concerns expressed by participants, Ofgem proposed that NGC should be required to make available information in a timely fashion on the volumes and the prices of the contracts that it has purchased as well as publishing Procurement Guidelines and Balancing Principles. In addition, we noted that our proposal to include energy balancing contract costs in energy imbalance charges would ensure that imbalance charges captured all the costs of energy balancing and removed any possible distortions that might otherwise have arisen due to particular procurement decisions by NGC.
- 3.26 In relation to the need for NGC to have energy accounts if it wishes to purchase/sell energy contracts, Ofgem argued that NGC should be permitted to have such accounts in order that it may purchase and sell energy outside the Balancing Mechanism as described above, i.e. it should be allowed to submit energy contract volume notifications⁴³ and metered volume reallocation notifications.⁴⁴ However, it was also noted that it is inappropriate to settle any surpluses and deficits of energy on NGC's Energy Accounts at Energy Imbalance Price. This is because to do so would distort the decision as to whether balancing services should be purchased through or outside the Balancing Mechanism and we noted that the BSC specification was being developed on this basis.⁴⁵ Notifications of bilateral (energy) contract volumes with NGC as counter-party will be accepted, but NGC's part of the contracts will not be processed further in Settlement i.e. NGC will not be directly exposed to energy imbalance charges.

⁴³ In order to take account of the quantities of purchase and sale of electrical energy in a particular settlement period in Energy Imbalance, it is necessary for such contract quantities to be notified into central settlement. Under the new trading arrangements, both parties to a contract must notify the relevant volumes into central settlement through a single agent. The Energy Contract Volume Notification Agent (ECVNA) acts on behalf of the trading parties, and notifies information relating to the electricity trade into central settlement.

⁴⁴ Under NETA, it will be possible for the energy flowing to or from an individual BM Unit to be allocated between two or more different parties for the purpose of calculating energy imbalances. Thus, NETA provides the facility for parties to aggregate their imbalance through the use of Metered Volume Reallocation Notifications.

⁴⁵ If NGC's imbalances were settled at Energy Imbalance Prices, then in buying (or selling) energy under bilateral contracts NGC would not only have to pay or be paid the price in the bilateral contract but also to pay or be paid at the prevailing imbalance prices for the contract volume under the BSC (NGC would have no metered volume and hence any net outstanding contract volumes would create an imbalance). Thus, the net effect to NGC will be that it will have to pay or be paid the bilateral contract price in addition to paying or being paid either the System Sell Price (SSP) or the System Buy Price (SBP). This would inappropriately distort the choice between the purchase of Balancing Services inside and outside the Balancing Mechanism.

3.27 It was raised as a consideration whether NGC should be prohibited from selling (energy) products back into the Balancing Mechanism. For example, NGC might choose to purchase energy under bilateral contract, and after Gate Closure may find that it no longer needs the energy it has purchased (i.e. NGC would have a long position). The April consultation noted that there were three main options in relation to this issue:

- ◆ not to allow NGC to sell products back into the Balancing Mechanism;
- ◆ allow NGC to post bids/offers into the Balancing Mechanism itself, and then accept that bid/offer in the Balancing Mechanism; or
- ◆ accept that NGC may agree terms with the counter-party to the energy contract, that enables the counter-party to post a bid/offer into the Balancing Mechanism that, if chosen, would have the effect of unwinding the energy contract.

3.28 Ofgem argued that the first option (not allowing NGC to sell products back into the Balancing Mechanism) would be inconsistent with giving NGC discretion in the forms of contract it may use. However, allowing NGC to place bids directly into the Balancing Mechanism (the second option) might give it undue power on both sides of the market in the Balancing Mechanism. Thus, Ofgem proposed allowing NGC to agree with participants the terms under which it would be able to unwind energy contracts. No changes to the central systems would be required to effect this since it will be for NGC and potential counterparties to consider the terms under which NGC buys and sells energy. NGC could, of course, unwind a long or short energy position by accepting bids and offers in the Balancing Mechanism that are not linked to any underlying contract position.

NGC's View

3.29 NGC welcomed Ofgem's proposal that it should be given discretion with regard to the procurement of balancing services including the purchase of energy in forwards markets, subject to appropriate safeguards. NGC also believed that Ofgem's proposed treatment of its energy accounts under NETA was appropriate.

Other Respondents' Views

- 3.30 Twenty one other respondents to the April Consultation commented on the proposal to allow NGC discretion as to how it procures balancing services. Of these, eleven respondents were in favour of allowing NGC discretion and nine were against. One other respondent commented on this issue but did not proffer an opinion.
- 3.31 Seven respondents emphasised the need for transparency in the procurement of balancing services by NGC if it was to be allowed discretion, and four other respondents specifically mentioned the need for an appropriate incentive scheme. Some respondents argued that appropriate safeguards should be in place to ensure that NGC did not discriminate between participants or distort trading in the forwards markets. One respondent commented that affording NGC too much discretion coupled with the difficulties associated with setting NGC's incentive scheme target has the potential to limit the benefits that may arise from the introduction of NETA.
- 3.32 Nineteen other respondents to the April Consultation commented on the related issue of NGC being able to purchase energy in forwards markets. Of these, one respondent saw no objection to NGC buying energy in the forwards markets provided it is solely for balancing the system and not speculative trading. This respondent believed that there were circumstances in which it would be economic for the SO to buy energy forward as opposed to purchasing option contracts.
- 3.33 Eighteen respondents expressed concern over the proposal to allow NGC to purchase energy in the forwards markets. Of these, six respondents were concerned that appropriate safeguards needed to be in place to ensure that NGC uses its discretion only to balance the system efficiently and not to engage in speculative trading. The main concern was that NGC could distort the workings and liquidity of the energy markets, with one respondent noting that NGC is operating with a different risk profile from that of the other market participants.
- 3.34 One respondent believed that if NGC were to be permitted to trade energy ahead of Gate Closure, the incentive scheme should be devised to ensure that NGC only uses its discretion in order to operate and maintain a secure

transmission system. Another respondent thought that NGC should be subject to a 'market abuse' condition in relation to its purchase and sale of balancing services and a non-discrimination clause in relation to the purchase and sale of forwards, futures and derivatives contracts.

- 3.35 Sixteen respondents to the April Consultation commented on the proposal that NGC should not have an energy account. Of these, eight respondents agreed that NGC's imbalances need not be settled at imbalance prices, whilst seven believed that they should. One other respondent provided comments but did not proffer an opinion. One respondent stated that it would be inappropriate for NGC to have an energy account and face imbalance charges since this would be inconsistent with NGC's unique role as system balancer.
- 3.36 Of the respondents who did not agree with the proposal, the consensus view was that if NGC is allowed to trade in the forward markets, then it would effectively be acting as a trader and therefore it should be exposed to the same consequences as any other trader.

Ofgem's Conclusions

- 3.37 Having carefully considered respondents' views to previous consultation documents, Ofgem/DTI, in the June 2000 NETA Licence Changes document, maintained that NGC should be allowed the discretion to acquire electricity in order to operate the system and/or operate it economically and efficiently. Ofgem/DTI believe that manipulation by large participants is much more likely to damage liquidity in contract markets than NGC's ability to trade energy.
- 3.38 This continues to be our view. We consider that it is important for consumers that NGC is able to act as a countervailing force to the potential market power of participants in the Balancing Mechanism. We believe that the safeguards that have been put in place address the concerns raised by respondents. These safeguards include NGC's licence requirements to operate the system in an efficient, economic and co-ordinated manner and to publish Procurement Guidelines and Balancing Principles coupled with its licence prohibitions on discrimination and acquiring electricity for purposes other than operating the system and provide limits to NGC's discretion.

- 3.39 Forward energy trading by NGC will be subject to market surveillance not only by Ofgem but also by the FSA and the market operators of any exchanges on which NGC trades. In addition, NGC's activities as SO will be subject to an incentive scheme designed to ensure that NGC's interests are aligned with those of consumers. Finally, we are continuing to explore ways in which an appropriate level of information on its contracting activities can be made available to interested parties in a timely fashion (for example, by publication on its website). The information NGC intends to provide to the market, including the form of the information and frequency of release, will be outlined in NGC's Procurement Guidelines.
- 3.40 Ofgem remains of the view that it would be incorrect to charge NGC at imbalance prices for any energy imbalances resulting from forward trading of energy. In relation to NGC selling back products into the Balancing Mechanism, Ofgem continues to believe that this should be a matter for the commercial arrangements between NGC and service providers.

Procurement Guidelines and Balancing Principles Statements

Previous Consultations

- 3.41 In the April Consultation, Ofgem discussed a package of measures designed to facilitate effective and transparent system operation under NETA. An important component of this package was a licence condition for the publication of statements on how NGC intends to procure and utilise balancing services (the Procurement Guidelines and Balancing Principles respectively). We suggested that the form of the statements would be subject to approval by the Director General. We also proposed that initially these statements could be confined to an appropriate level of broad principles, with the option of changing the level of detail required if broad principles were to prove insufficient in ensuring an open, transparent and efficient procurement and utilisation process.
- 3.42 In the June 2000 NETA Licence Changes Conclusions Paper, Ofgem/DTI concluded that:

- ◆ NGC will be required to produce and publish a procurement statement (the Procurement Guidelines), at twelve monthly intervals. This statement will give a general indication of NGC's proposed purchasing requirements and methods of procurement, and that the form will require regulatory approval. NGC will also be required to issue a revised version if its intentions change after the statement is published; and
- ◆ NGC will be required to produce a Balancing Principles statement, the form and content of which require the prior approval by the Director General and this statement will be subject to annual review. NGC will be required to provide an annual, audited assessment of its level of compliance with the principles laid out in the statement. This report will be made available to all interested parties.⁴⁶

NGC's View

- 3.43 Initial drafts of NGC's Procurement Guidelines and Balancing Principles were included in the April Consultation, together with Ofgem's comments. NGC has subsequently issued revised versions of these statements, taking account of these comments and responses received from other participants. These were published as part of Ofgem's July policy statement⁴⁷ and are included as Appendix 3 and Appendix 4 to this document.

Other Respondents' Views on the Revised Statements

- 3.44 NGC's revised Procurement Guidelines and Balancing Principles were discussed at a workshop organised as part of the BSC consultation process held on 17 July 2000. Respondents agreed with Ofgem that there has been a considerable improvement in the content of the second drafts of the Balancing Principles and Procurement Guidelines but they emphasised the need to increase the transparency of system operation in more detail, wherever possible. In particular respondents asked if NGC could provide further detail in the following areas:

⁴⁶ It is worth noting that Condition 7B 11 (b) of NGC's Transmission Licence qualifies this in relation to statements on any matter that relate to the affairs of any person where the publication of that matter would or might seriously and prejudicially affect his or her interests.

⁴⁷ 'The New Electricity Trading Arrangements and Related Transmission Issues, An Ofgem Policy Statement', Ofgem July 2000.

- ◆ NGC taking actions outside of the balancing mechanism;
- ◆ the provision of balancing services and in particular regulating reserve;
- ◆ delineation between transmission faults and constraints;
- ◆ clarification of NGC's proposed policy on arbitrage trades;
- ◆ the provision of market reports; and
- ◆ the production and publication of regular reports which highlight those areas in which NGC has deviated from its Balancing Principles.

Ofgem's Conclusions

- 3.45 NGC is to produce and publish Procurement Guidelines and Balancing Principles that will be in place for the start of NETA following the proposals contained in Ofgem/DTI's June 2000 NETA Licence Changes document.
- 3.46 NGC will be producing further drafts of both the Balancing Principles and Procurement Guidelines and we expect that the views expressed above, together with respondents' views to this consultation document, will be taken into account.
- 3.47 Final drafts of the Balancing Principles and Procurement Guidelines will be produced in October 2000. It is for the Director General to approve the final form of the documents before the first period of trading under NETA. Final versions of both documents will be available from NGC and will be published by Ofgem and NGC on their respective web-sites.⁴⁸

Acceptances in the Balancing Mechanism and the Treatment of Transmission Failures

Previous Consultations

- 3.48 Deemed Bids and Offers were originally defined under NETA as applying to physically achievable output or demand ranges for a BM Unit⁴⁹ that were not

⁴⁸ www.ofgem.gov.uk and www.nationalgrid.com

⁴⁹ Balancing Mechanism (BM) Units are the smallest unit of participation under the new trading arrangements.

covered by freely submitted Bids and Offers. Deemed Acceptances were defined as changes to participants' physical positions that were instructed by NGC without issuing a Bid-Offer Acceptance and thus led to participants being exposed to imbalance charges. A Deemed Acceptance could arise, for example, when automatic control equipment curtails demand or generation without NGC issuing despatch instructions (i.e. issuing a bid-offer acceptance).

3.49 By the time of the April Consultation, a number of further proposals relating to these issues had been formulated. First, it was proposed that the NETA systems and processes would be designed such that Deemed Bids and Deemed Offers would be unnecessary. We outlined a number of reasons why this might be appropriate at the start of the new trading arrangements:

- ◆ the System Operator will have the right to direct the output of all BM Units in emergency circumstances. However, such directions will be treated as a Bid-Offer Acceptance if there are freely submitted bids and offers available in the Balancing Mechanism. Furthermore, BM Units will only be directed to operate outside freely submitted bid and offer ranges in exceptional circumstances; and
- ◆ if Deemed Bids and Offers were to be used, then it would be necessary to establish a centrally determined price to apply in the unlikely event that they were called. Given that parties have freedom to submit their own bids and offers into the Balancing Mechanism, there would be great difficulty in establishing a fair and non-discriminatory price.

3.50 It was therefore proposed that if, under emergency circumstances, the System Operator directs BM Unit operation in an output range for which freely submitted bids and offers do not exist, Deemed Bids and Deemed Offers would not be used. Any resultant change in output would consequently be settled at the prevailing energy imbalance price.

3.51 Second, "Deemed Acceptances" will be part of NETA in the sense that instructions to participants to change output during system emergencies ("Emergency Instructions") will be treated as Acceptances if freely submitted Bids and Offers are available.

- 3.52 It was suggested that demand or generation reductions caused directly by transmission and distribution faults/failures be treated as imbalances that are cashed out at the relevant imbalance price. Ofgem, recognising the concerns expressed by participants relating to being exposed to imbalance charges under circumstances beyond their control, indicated that it would be addressing the issue of transmission faults and failures as part of the wider review of transmission access and pricing arrangements. We considered that this was the proper context in which to address the treatment of transmission failures.
- 3.53 In the June 2000 NETA Licence Changes document, Ofgem/DTI argued that there could be circumstances in which NGC may resort to involuntary action rather than exhausting all available Balancing Mechanism bids and offers and that such circumstances need to be sufficiently well defined. Ofgem/DTI believed that this issue was best dealt with in the Balancing Principles statement and in the Grid Code (and Balancing Codes).

NGC's View

- 3.54 NGC believed the proposed treatment of acceptances in the Balancing Mechanism and transmission failures was appropriate for the start of NETA. NGC acknowledged that treating changes in generation output or demand that occur due to transmission faults as an imbalance is not a satisfactory long term solution since it would expose participants to risks which they cannot control. NGC stated that a market-based solution could only be developed as part of the forthcoming reform of transmission access.

Other Respondents' Views

- 3.55 Seventeen other respondents to the April Consultation commented on this issue. Of these, six agreed with Ofgem's view whilst eight respondents were concerned with the proposals. Three other respondents provided comments but did not express an opinion.
- 3.56 Six of the respondents who expressed concern did not agree with the proposal to treat transmission failures as imbalances. Another respondent believed that any interruption due to distribution or transmission faults must be treated as a deemed acceptance to be settled at whatever price had been bid (or offered).

- 3.57 One respondent who agreed with Ofgem's proposal emphasised the need for NGC to manage system curtailments in a non-discriminatory manner.

Ofgem's Conclusions

- 3.58 Ofgem has sought to define more clearly the circumstances in which NGC would not log a Bid-Offer Acceptance and the following definitions will be in place for the start of NETA:
- 3.59 the drafting of the Balancing Codes of the Grid Code define in broad terms the circumstances under which NGC will be able to issue Emergency Instructions that are necessary to preserve the integrity of the NGC Transmission system but are not Bid-Offer acceptances. Except for black start situations or circumstances in which parts of the transmission system are "islanded", the energy covered by the Emergency Instruction will be treated as a Bid-Offer Acceptance to the extent that relevant Bids or Offers have been submitted.
- 3.60 Desynchronisations of plant as a consequence of a transmission faults/failures will not be treated as Emergency Instructions and, where relevant, the party will be cashed out at the start of NETA at imbalance price.⁵⁰ Once the transmission fault/failure has cleared then, in accordance with the Grid Code, a BM Unit is entitled to return to its Final Physical Notification as amended by any previous Bid-Offer Acceptances in a manner consistent with its dynamic data and NGC will be required to issue a Bid-Offer Acceptance to the extent that it does not wish the BM Unit to return (in this manner) to its FPN.

⁵⁰ As an example of what this means in relation to transmission faults/failures, if a BM Unit is desynchronised from the transmission system as a result of a fault/failure of the transmission system, then the desynchronisation will not be treated as an Emergency Instruction. Furthermore, the change in output or input of the BM Unit resulting from the desynchronisation will not be covered by a Bid-Offer Acceptance.

Table 3.1 - List of directing actions to be settled at Bid/Offer Price and Imbalance Price

Action	Initial NETA Treatment	Discussion
BM Acceptance	BM trade @ bid/offer price	
Energy associated with delivery of Continuous frequency response	Imbalance	It is not proposed that frequency correction of accepted BM volumes will be implemented for initial NETA.
Energy associated with the delivery of Commercial low frequency (LF) frequency response	Imbalance. There may be an associated Balancing Services contract.	Treating as an imbalance would be consistent with the above.
'Back-stop' LF demand disconnections	Imbalance	These cover 60% of total system demand, and are initiated below 49 Hz.
Energy associated with the delivery of contracted reserve	Bid/Offer Price if purchased through BM. Imbalance otherwise – There may be an associated Balancing Services contract.	Treating as a BM Acceptance seems sensible, but may not be possible initially for some services (e.g. fast reserve / pump despatch).
Inter-trips	Bid/Offer Acceptance – there may be an associated balancing services contract	There are currently only a limited number of inter-trips.
Transmission faults/ Transmission System disturbance resulting in a trip.	Imbalance	Once the transmission fault/failure has cleared NGC will be required to purchase Bids or Offers to the extent that it does not wish the BM Unit to return (in this manner) to operating at it's FPN level Will need to further consideration as part of Transmission access review.
Distribution Constraints	Imbalance	
Distribution faults	Imbalance	
Rota disconnection of demand	Imbalance	
Emergency action outside dynamics (e.g. rapid post-fault 'drops')	BM trade @ bid/offer price	

3.61 Ofgem believes that the proposed treatment of transmission faults/failures under NETA is not an acceptable medium to long term solution. New transmission access and pricing arrangements offer the most appropriate solution to these issues and Ofgem will continue to work to develop solutions based on such arrangements. However, given that we do not expect new transmission arrangements to be in place before Autumn 2001, Ofgem will continue to consider other possible shorter term solutions. As part of this process, we have asked NGC to make available information on the frequency, duration and pattern of transmission failures in order that participants can, at least at the start

of NETA, assess, and perhaps hedge or insure against, the risks that they will face.

Conclusions

- 3.62 This chapter has considered five important issues with regard to the procurement and utilisation of balancing services. Our views on these issues are summarised below.
- 3.63 First, Ofgem is committed to reviewing the mandatory obligations for the provision of balancing services. However, for the start of NETA, to avoid unnecessary risks to system security, participants should continue to have the same obligations as they do now.
- 3.64 Second, Ofgem believes that the implementation of a frequency response market should be delayed until after the start of NETA.
- 3.65 Third, having carefully considered the responses to our various consultation documents, Ofgem continues to believe that NGC should be given discretion in procuring balancing services, including allowing it to trade energy forwards for the purpose of operating the system. This discretion will be balanced with:
- ◆ a new licence obligation on NGC to operate the transmission system in an efficient, economic and co-ordinated manner;
 - ◆ an effective incentive scheme;
 - ◆ an obligation to publish Procurement Guidelines and Balancing Principles; and
 - ◆ a licence prohibition on speculative trading.
- 3.66 These measures should ensure that the way in which NGC procures and utilises balancing services is both open and transparent. Ofgem believes that the latest drafts of NGC's Balancing Principles and Procurement Guidelines represent a substantial step forward in their development and are now close to being finalised. We are continuing to explore with NGC, how and what information on its balancing contracts should be published.

3.67 Fourth, Ofgem agrees with the proposals that:

- ◆ energy imbalances that NGC incurs through forward trading of energy should not be cashed out at imbalance prices;
- ◆ there should not be Deemed Bids or Offers; and
- ◆ Emergency Instructions will be treated as Acceptances in the majority of circumstances, and will be settled at Bid or Offer price when relevant bids and offers exist.

3.68 Finally, Ofgem accepts that in the absence of new transmission access and pricing arrangements at the start of NETA, participants that are forced into energy imbalance as a result of transmission or distribution failures will be exposed to imbalance charges. However, Ofgem will continue to consider whether some interim solution can be found based on incentivising network operators such as NGC on the costs of network failures.

4. Energy Imbalance Prices under NETA

Introduction

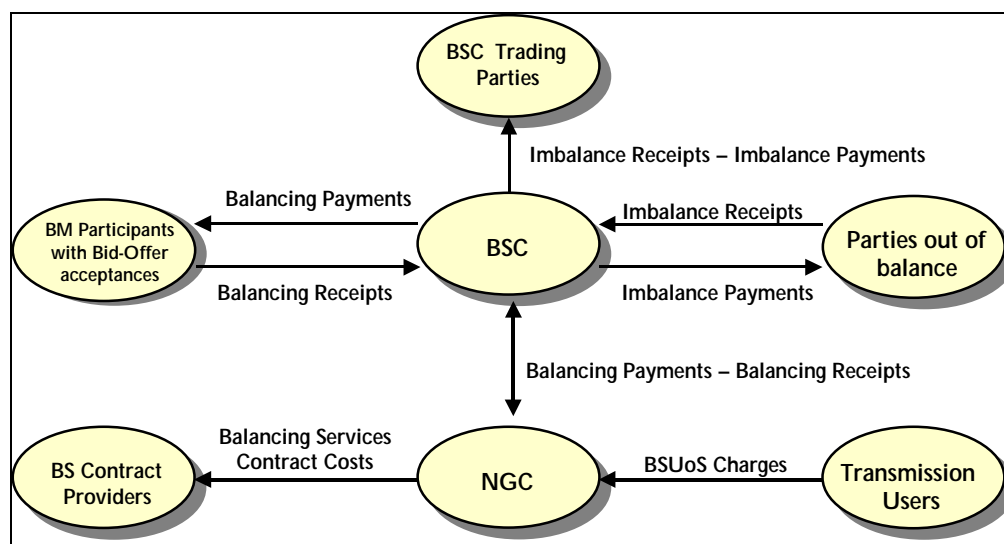
- 4.1 The July 1999 and October 1999 NETA documents described how energy imbalance prices would be calculated as the volume weighted average of all accepted Balancing Mechanism offers (in the case of the System Buy Price) and bids (in the case of the System Sell Price). Participants will be exposed to the relevant imbalance price on the basis of differences between their contract position at Gate Closure adjusted by any accepted bids and offers in the Balancing Mechanism and their metered volumes (adjusted for losses). Therefore, the actions the SO takes in the Balancing Mechanism naturally flow through to energy imbalance prices charged to out of balance participants.
- 4.2 In the December Consultation, Ofgem argued that participants who are out of energy balance should be exposed to all the costs incurred by the SO in achieving a gross energy balance (i.e. matching demand and generation at the half-hourly level). However, imbalance prices based solely on actions taken by the SO in the Balancing Mechanism are unlikely to reflect the total costs incurred by the SO in maintaining a gross energy balance. For example, they would not include the costs incurred by the SO in contracting ahead for reserve to meet energy imbalances. Furthermore, some Balancing Mechanism actions will be taken for system balancing reasons such as those taken to provide frequency response services or to relieve transmission constraints. Ofgem argued that system balancing actions taken by the SO should be recovered from all participants. We therefore proposed, in the April Consultation, that energy balancing contract costs should be included in energy imbalance prices and that “tagging” should be used to remove at least some system balancing costs from imbalance prices.

Costs Incurred by SO under NETA

- 4.3 Energy imbalance charges are not a cost recovery mechanism. The SO will derive a revenue in relation to balancing services costs through a charge across all BSC parties based on their share of total BM Unit Metered Volume – the

Balancing Services Use of System (BSUoS) charge.⁵¹ Figure 4.1 summarises the cash flows under NETA and the diagram differentiates between the cash flows under NETA for imbalance settlement (designed to price and settle imbalances based on the cost of balancing the system) and the recovery of all the costs of balancing services incurred by NGC.

Figure 4.1 - Cash Flows under NETA



Including Energy Balancing Contract Costs in Energy Imbalance Prices

Previous Consultations

4.4 Ofgem proposed that the costs of standing and regulating reserve contracts and forward energy contracts bought by NGC should be included in the calculation of System Buy Prices on the same basis as accepted Balancing Mechanism offers. Thus, participants who are short of energy⁵² would be exposed to System Buy Prices that reflect better the costs of energy balancing. Similarly, the costs of any “negative reserve” contracts and forward energy contracts sold by NGC should be included in System Sell Prices. We recognised that the boundary between energy and system balancing services can be difficult to define, but we believed

⁵¹ Ofgem and NGC, in consultation with participants, are currently discussing some of the more detailed aspects of how BSUoS charges will be calculated and charged to participants, with a view to NGC producing a LC10 Charging Statement to be approved by the Authority before Go Live. One of the key issues is whether costs to be aggregated over a day and allocated to half-hours should be recovered by NGC evenly across every settlement period in a day, or whether they should be allocated on a volume-weighted basis to specific settlement periods.

⁵² Generators who produce less than their contracted volume and customers/suppliers who consume more than their contract position are considered to be ‘short’ of energy.

that there were strong arguments for considering reserve and energy contracts as energy balancing services.

4.5 Specifically, Ofgem proposed that:

- ◆ the option (capability) fees of the contracts to be included should be spread uniformly over the core service periods specified in the contracts;
- ◆ any utilisation or difference payments should be targeted to the periods in which they were incurred; and
- ◆ the information on contract costs would, at least initially, be provided to the settlement system in the form of four aggregated numbers (BCA – Buy Price Cost Adjustment, BVA – Buy Price Volume Adjustment, SCA – Sell Price Cost Adjustment, SVA – Sell Price Volume Adjustment).

NGC's View

4.6 NGC acknowledged Ofgem's view that the cost of energy balancing contracts should be included in the calculation of imbalance prices and concurred with Ofgem's proposals regarding the contract types to be considered as energy balancing contracts. NGC agreed that it is desirable for the costs involved in energy balancing to affect imbalance prices in the settlement period for which the contracts apply and hence payments are made. Overall, it believed that the proposed methodology for including energy balancing contract costs in energy imbalance prices represents a pragmatic approach.

4.7 As part of the BSC consultation process, NGC presented a draft of the methodology for the inclusion of energy balancing contracts in energy imbalance prices that it would use at the start of NETA.

Respondents' Views

4.8 Seventeen respondents to the April Consultation commented on this issue. Fifteen broadly agreed with Ofgem's proposal that energy balancing contract costs should be included in energy imbalance prices. One respondent argued that the proposal was flawed and that it ran the risk of creating market failures. One other respondent provided comments but did not provide an opinion.

- 4.9 One of the respondents in favour of Ofgem's proposals believed NETA would not work if energy balancing contract costs were not allocated to the settlement period in which they occur and if the costs are not targeted to those out of balance.
- 4.10 Although the consensus amongst respondents was that the utilisation fees associated with energy balancing contracts should be included in energy imbalance prices, seven respondents were concerned with the proposal to include option fees in the calculation of energy imbalance prices. One respondent argued that since these are costs incurred in order to provide a stable system they benefit all participants. Another respondent argued that the purchase of option contracts would ensure that the SO has sufficient bids and offers from which to take energy balancing actions, and as such these are a benefit to the market as a whole, and hence they should be recovered from all participants.
- 4.11 One respondent was concerned with the proposal that option fees should be spread over some 'core services' periods which are to be defined in the contracts. This respondent was concerned that the SO may have to recover contract fees from a small volume of imbalances which could result in extremely high energy imbalance prices.
- 4.12 Respondents to the BSC consultation were concerned that the imbalance price adjustments should be calculated in an open, auditable and transparent manner. One argued that full information on all NGC's balancing contracts should be made available to participants before Gate Closure.

Ofgem/DTI conclusions on Licence Changes for NETA

- 4.13 In the June 2000 NETA Licence Changes document, Ofgem/DTI argued that a methodology for including the costs of energy balancing costs in energy imbalances prices needed to be established. This methodology was to be called the Balancing Services Adjustment Data (BSAD) methodology.
- 4.14 Ofgem/DTI stated that NGC would be responsible for producing and updating this methodology. A new condition in NGC's Transmission Licence (Condition

7B, Clause 6), was proposed that established the production, publication and governance of the BSAD methodology.

Ofgem's Conclusions

- 4.15 Ofgem has carefully considered respondents' views to the April Consultation. We have concluded that energy imbalance prices should, as far as possible, reflect the costs of all energy balancing costs whether incurred in the Balancing Mechanism or through energy balancing contracts purchased ahead of Gate Closure. We see no reason to change the methodology proposed in the April Consultation for including the costs of energy balancing contracts to be included in the calculation of energy imbalance prices.
- 4.16 Appendix 5 contains the methodology NGC proposes to employ at the start of NETA reflecting the conclusions in this document. Ofgem will reflect the views expressed by delegates at our recent industry forum in July 2000,⁵³ when we consult further with NGC on the form (including the level of detail) in which the BSAD methodology will be published. It is envisaged that the final version of the methodology will be published in October 2000 and will contain:
- ◆ further detailed calculations and formulae for the variables included within BSAD;⁵⁴
 - ◆ information on how the contract prices are derived;
 - ◆ an example of what the final methodology (calculations) will look like; and
 - ◆ a further breakdown of contract costs covering bundled services.
- 4.17 The BSAD methodology will need to be updated to reflect NGC signing additional types of contracts, where it is deemed that these new contract types should feed into energy imbalance prices. Ofgem continues to believe that NGC is the most appropriate body to have responsibility for producing and updating the methodology. As noted above, Ofgem/DTI proposed a licence

⁵³ Ofgem/NGC presentation on NGC's Balancing Principles, Procurement Guidelines and BSAD methodology under NETA.

⁵⁴ The BSAD is specified in Section Q, Paragraph 6.3 of the BSC.

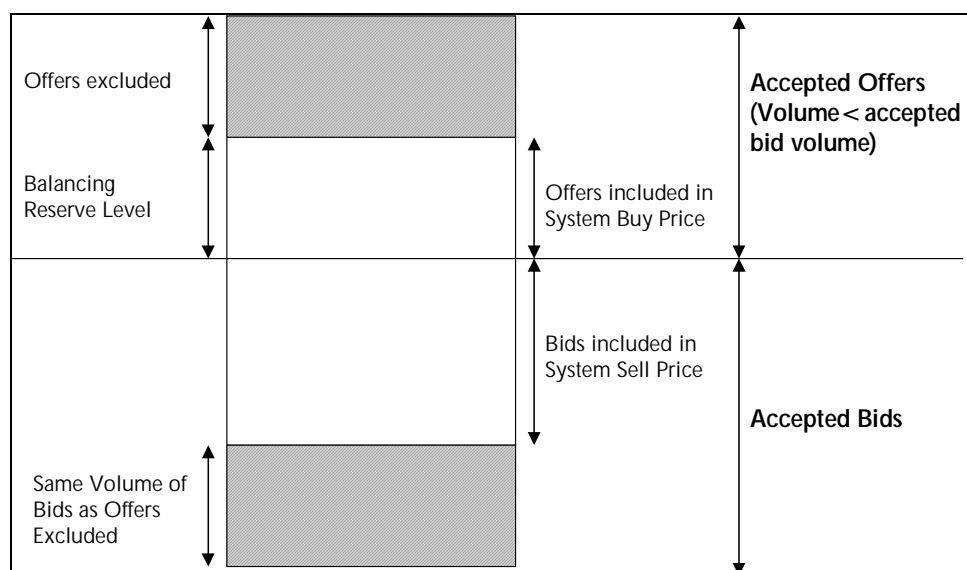
condition requiring NGC to publish and revise its BSAD methodology. The licence condition will be in place for the start of NETA.

Tagging

Previous Consultations

- 4.18 Ofgem has consistently suggested that it would be desirable to remove the costs of system balancing from the calculation of energy imbalance prices, since these costs should not be targeted only on participants who are out of energy balance.
- 4.19 The NETA programme (via the Balancing Settlements Expert Group and the DISG) developed a proposal for “tagging” Balancing Mechanism actions to exclude constraint costs from imbalance prices. This proposal may also remove some of the costs of frequency response and reactive power provision from energy imbalance prices. In the April Consultation, Ofgem accepted that any further removal was impractical for the introduction of NETA and that tagging represented a sensible interim solution (before the introduction of new transmission access and pricing arrangements).
- 4.20 Under the tagging proposal, after removing any arbitrage accepted offers or bids, matched volumes of the most expensive accepted offers and cheapest accepted bids would be removed from the calculation of energy imbalance prices until a ‘Balancing Reserve Level’ (discussed further below) is reached for either untagged offer or bid volumes. The Balancing Reserve Level (BRL) will apply to offer volumes if these are in aggregate smaller in magnitude than the accepted bid volumes, and vice versa. The remaining untagged bids and offers would then be used to determine imbalance prices. The volumes of bids and offers discarded will not be constrained by dynamics. Figure 4.2 illustrates how tagging would work for the case where the volume of accepted offers exceeds that of accepted bids. If the aggregate quantity of accepted offers, or of accepted bids is less than the BRL, no tagging will take place.

Figure 4.2 - Illustration of the tagging proposal



- 4.21 The BRL allows for the tagging process to be tuned (and potentially turned off). For example, if it is set to a value greater than the volume of accepted trades then no trades would be tagged and all costs will feed through to the imbalance prices. Alternatively, if it is set to a low value, more accepted bids and offers will be excluded from the price calculation process.

NGC's View

- 4.22 NGC stated that the trade tagging proposal provided a pragmatic way forward for the removal of response and constraint costs from energy imbalance prices.
- 4.23 It believed that setting the BRL was an important part of the tagging proposals. In order to provide a simple mechanism, and to provide certainty for market participants, NGC suggested that the BRL should be set in advance, based on average reserve requirements. This level could be agreed by the BSC panel, with advice and data provided by NGC.

Other Respondents' Views

- 4.24 Nineteen respondents to the April Consultation commented on this issue. Twelve respondents agreed that the proposed method seemed a practical way forward on this issue. Four respondents agreed with the principle of removing transmission constraints and other system balancing costs, but did not agree with the proposed method. The respondents were concerned about how, and at

what level, the BRL would be set. One respondent suggested it should be set using a defined formula before Gate Closure. Another respondent suggested it should be based on actual operational reserve requirements rather than some notional number. Three other respondents provided comments and requested further information but did not express an opinion.

Ofgem's Conclusions

- 4.25 Ofgem has carefully considered respondents' views on this issue and concluded that tagging represents an appropriate transitional arrangement for removing at least some of the costs of system balancing from the calculation of energy imbalance prices.
- 4.26 Having considered the views of respondents to our April Consultation, the July 2000 Policy Statement⁵⁵ and in the July 2000 BSC seminar,⁵⁶ Ofgem believe that the value of the BRL should be set so as to exclude balancing actions taken in relation to the alleviation of transmission constraints and in order to place BM Units in a position to provide frequency response and reactive power, but to include balancing actions for energy balancing reasons (including the provision of reserve). A number of respondents also argued that the BRL should be set ex-ante. Ofgem can see no reason why this should not be the case, and agree that the BRL should be set ex-ante.
- 4.27 Ofgem/DTI have also proposed the value of the BRL should be set annually (and thereafter updated) by the BSC Panel (as discussed during the BSC Consultation), subject to the approval of the Director General.⁵⁷ The initial value will be set during the period between Go Active and Go Live.⁵⁸ This governance arrangement proposed for BRL is felt to be necessary as the value or values of BRL are likely to require regular review, and this parameter is of particular importance because of the direct impact that it has on Energy Imbalance Prices. Thus, a non-prescriptive approach to the definition of BRL has been proposed to provide flexibility to the Panel in determining the parameter.

⁵⁵ 'The New Electricity Trading Arrangements and Related Transmission Issues. An Ofgem Policy Statement', July 2000.

⁵⁶ Seminar held by the PDO in relation to the level of Balancing Reserve under NETA.

⁵⁷ Once the Authority has been designated, it will be the Authority rather than the Director General who approves BSC modifications.

⁵⁸ It is envisaged that a further consultation will be undertaken by the BSC Panel (and in conjunction with Ofgem and NGC) before the final level is decided.

Conclusions

- 4.28 In conclusion, Ofgem continues to believe that reserve and energy contracts should be considered as energy balancing services and all the costs of such contracts should be included in the calculation of energy imbalance prices. In consultation with NGC, a detailed methodology has been developed which achieves some targeting of reserve and energy contract costs, and it is intended that this should be used from the beginning of NETA.
- 4.29 Ofgem also considers that the removal of system balancing costs from energy imbalance prices is desirable. However, for the start of NETA, Ofgem believes that it would not be practicable to remove fully the costs of frequency response and transmission constraints actions from energy imbalance prices. A tagging methodology has been developed that will remove at least some of these costs from energy imbalance prices, and Ofgem proposes that this methodology should be adopted for the start of NETA.

5. Form, Duration and Scope of the SO Incentive Scheme under NETA

Introduction

- 5.1 As discussed in previous chapters, NGC's role as SO requires it to purchase a range of services to ensure the efficient, economic and co-ordinated operation of the transmission system and hence it incurs substantial costs. NGC is currently incentivised to control the costs of purchasing these services via four profit-sharing (sliding scale) schemes. The incentive schemes on NGC to date have been a success in reducing the costs of balancing the system and have delivered significant cost savings to customers. NGC will need to purchase similar services under NETA and thus should face similar financial incentives to manage its costs.
- 5.2 This chapter and Chapter 6 discuss the development of the incentive scheme on NGC as SO to be introduced when NETA is implemented. The form, duration and scope of the incentive scheme are discussed in this chapter, which presents Ofgem's final proposals in these areas. Chapter 6 addresses the issues involved in setting the parameters for the scheme.

Background

Incentive Schemes on NGC under the Current Arrangements

- 5.3 Since 1994/95 NGC has been provided with financial incentives to control those costs that were judged to be under its influence. NGC is currently incentivised on three main elements of costs: Transmission Services Uplift (TSU), Reactive Power Uplift (RPU) and Energy Uplift (EU). In addition, NGC is incentivised to minimise the volume of transmission losses at a fixed price.
- 5.4 Table 5.1 presents the details of the current incentive schemes on NGC, that have been agreed between NGC and Ofgem⁵⁹ (in the case of TSU and RPU) and NGC and Suppliers (in the case of EU and transmission losses), that apply from 1 April 2000 to the introduction of NETA.

⁵⁹ See 'NGC Incentive Schemes from April 2000, Transmission Services Uplift and reactive power Uplift Schemes. A decision document', February 2000.

Table 5.1 - Incentive Schemes on NGC to Apply from 1 April 2000

	Target value	Upside sharing factor	Downside sharing factor	Cap on revenues to NGC	Collar on payments by NGC	Operational expenditure allowance
Transmission Services Uplift	£201.2m	50%	50%	£21m	£21m	£0.54m
Reactive Power Uplift	£46.5m	50%	50%	£2.5m	£2.5m	
Energy Uplift	£14m ⁶⁰	12%	5%	£3m	£2m	
Transmission losses	5.13 to 5.33 TWh at a price of £25/MWh	50%	25%	£4m	£2m	

Principles for an SO incentive scheme

5.5 The December Consultation highlighted a number of principles which Ofgem suggested should underlie the design of incentives on the SO under NETA. These principles were reiterated in the April Consultation. The principles are that the scheme(s) should:

- ◆ ensure that costs overall are at an efficient level, not just individual elements;
- ◆ recognise the interactions between NGC's roles as system balancer and energy balancer; and
- ◆ recognise and take account of the interactions between the roles of SO and TO performed by NGC.

⁶⁰ The target value will be reviewed in early October 2000 by looking at the value of capacity payments (calculated as PPP-SMP) from 1 April 2000 to end of September 2000. If capacity payments are in the range £15/kW to £20/kW the target value will be left untouched. Otherwise, the target value will be vary with different levels of capacity payments.

- 5.6 In the context of these principles, Ofgem proposed that the enduring SO incentive scheme under NETA should take the form of a single incentive scheme covering all energy and system balancing costs incurred by NGC (to incentivise NGC consistently across all cost categories) and should be aligned in duration with NGC's Transmission Price Control (to incentivise NGC consistently across its SO and TO activities). Ofgem suggested that the form of the incentive scheme should continue to be a sliding scale i.e. a profit sharing scheme. We further suggested that the incentivised target in an enduring incentive scheme should be based on a target volume of services costed at an appropriate reference price (possibly a price emerging from the forwards markets).
- 5.7 However, Ofgem recognised that it might not be practicable to implement an enduring SO incentive scheme from the inception of NETA. For example, there will be no data on Balancing Mechanism volumes on which to base such a scheme and it may take time for an appropriate reference price to emerge. Moreover, the incentive scheme will need to be revised when new transmission access and pricing arrangements are introduced. Consequently, Ofgem argued that it might be appropriate to establish an initial incentive scheme of a relatively short duration.

Form of the Incentive Scheme

- 5.8 Ofgem has argued that, in general, the form of an incentive scheme (whether economic purchasing, RPI-X, or profit sharing) should be determined by the extent to which NGC can control the costs covered by the scheme.
- 5.9 The current incentive schemes are based on a sliding scale or profit sharing design with incentive scheme payments determined by the difference between a cost forecast and outturn costs subject to sharing factors that determine the proportion of lower or higher costs against a target that are kept by or paid by NGC.

Previous Consultations

- 5.10 Ofgem has argued that we favour the continuation of a sliding scale form of incentive with appropriately set targets, caps, collars and sharing factors.

NGC's View

- 5.11 NGC commented that given the success of sliding scale in delivering savings to customers, it believed that Ofgem's decision to retain a sliding scale form of regulation for the initial scheme was appropriate.

Other Respondents' Views

- 5.12 Eighteen respondents to the April Consultation commented on this issue and they all agreed that the proposal to retain a sliding scale form of incentive was appropriate.

Ofgem's Conclusions

- 5.13 Ofgem has concluded that a sliding scale form of incentive with appropriate targets, caps, collars and sharing factors should provide an effective incentive on NGC to ensure that incentivised costs are maintained at an efficient level and where possible achieve further reductions. Ofgem is pleased that all respondents agree that the sliding scale incentive scheme is effective and transparent and thus we propose to retain a sliding scale form for the initial incentive scheme.⁶¹

Duration of the Incentive Scheme

- 5.14 Previous incentive schemes on NGC have lasted no more than two years. NGC has suggested in the past that it would be more appropriate to implement incentive schemes of a longer duration. This would encourage NGC to undertake activities that would have a progressive and longer term impact on the costs of energy and system balancing and recognise the interactions between its SO and TO functions.

Previous Consultations

- 5.15 Ofgem has argued that longer term incentive schemes would provide a more effective incentive on NGC. However, the drivers of energy and system

⁶¹ Whilst the sliding scale form will be retained for the direct costs of balancing the system, it remains for consideration how NGC's internal costs should be treated when all its SO costs are included in the incentive scheme. This is briefly discussed later in the chapter.

balancing costs under NETA will not be fully understood until after the new arrangements have been implemented. In addition, the introduction of new transmission access and pricing arrangements will require changes to the incentive schemes on NGC. Given this, Ofgem proposed introducing an initial SO incentive scheme of a relatively short duration. We suggested that the scheme might run for a year from the implementation of NETA but with specific provisions included for the wind-up of the scheme on the introduction of new transmission access and pricing arrangements.

NGC's View

- 5.16 NGC agreed with Ofgem that the initial scheme should be of relatively short duration given the initial uncertainty in costs. It believed that in the longer term, once the behaviour of market participants had become better understood, the incentive scheme should be of longer duration. However, NGC believed that there were practical problems with Ofgem's proposal that the initial incentive scheme should run for a year from the implementation of NETA to October 2001 relating to the timing of contracting rounds and accounting for its internal costs. It accepted that a scheme which only ran until 31 March 2001 might not provide sufficient time to draw any useful conclusions on the level of balancing costs under NETA for the purpose of putting in a place a new enduring scheme. Consequently, NGC proposed that the initial scheme should run from the implementation of NETA until 31 March 2002.

Other Respondents' Views

- 5.17 Eighteen other respondents to the April Consultation commented on this issue. Of these, thirteen respondents agreed with Ofgem's proposal of an initial scheme with a duration of one year to include wind-up provisions. Four respondents did not think that this was an appropriate proposal. One further respondent provided comments but did not express an opinion.
- 5.18 The four respondents who did not agree with Ofgem's proposal preferred an initial incentive scheme of a shorter duration, suggesting that the initial incentive scheme should end in March 2001, an enduring incentive scheme should then be established, to bring the duration in line with the NGC Price Control and the new transmission access arrangements. One respondent believed that a shorter

scheme would allow the enduring scheme to benefit from experience during the initial period of NETA.

Ofgem's Conclusions

- 5.19 Ofgem continues to believe that in the longer term the duration of the incentive scheme should become consistent with that of NGC's Transmission Price Control. However, we accept that the initial scheme under NETA could be of a shorter duration given the initial uncertainty in costs and the need for a comprehensive scheme when new access arrangements are implemented.
- 5.20 We accept the argument that it is desirable for the duration of the incentive scheme to be aligned with financial and contracting years, which end on 31 March and begin on 1 April of each year. We also accept that an initial SO incentive scheme under NETA, with a duration until 31 March 2001 (i.e. four to five months) might not provide sufficient time to draw useful conclusions on the level of balancing costs under NETA for the purpose of putting in a place a new enduring scheme.
- 5.21 Thus, we agree with NGC's proposal that the scheme should run until 31 March 2002. This will give time for the establishment of new arrangements and thus it will be more practicable at that point to introduce an enduring scheme, which takes account of new transmission access and pricing arrangements.

Scope of the SO Incentive Scheme

- 5.22 In order to develop an incentive scheme on the SO under NETA, it is necessary to consider which SO costs should be included in the scheme. The coverage should be determined by the functions that the SO carries out (namely energy and system balancing) and the extent to which the SO can control the costs of carrying out these functions.

Previous Consultations

- 5.23 After considering various options for the coverage of the initial incentive scheme, Ofgem proposed in the April Consultation that it should cover all energy and system balancing costs. However, noting the concerns that NGC has

expressed about its potential exposure to the Net Imbalance Volume,⁶² we have accepted that there is a case for reducing NGC's exposure to the Net Imbalance Volume. Thus, we effectively propose to remove from the total costs an allowance equal to the cost of purchasing the Net Imbalance Volume at a reference price to be determined before applying the incentive.

- 5.24 Ofgem noted that NGC would still remain exposed to the difference between the relevant imbalance price (System Buy Price if the system is short, System Sell Price if the system is long) and the reference price used to reduce its exposure to Net Imbalance Volume. Thus, to ensure that this approach does not provide NGC with perverse incentives, it will be necessary for the reference price to lie between the two imbalance prices. Under these circumstances, NGC will be incentivised to minimise the difference between imbalance prices and the reference price by minimising the differential between the price of bids and offers required to resolve imbalances i.e. accept the highest priced bids and cheapest offers.
- 5.25 The current TSU incentive scheme includes an allowance for Ancillary Services Overheads and some incremental TS costs that are not covered under the current Transmission Price Control. Until 31 March 2001, Ofgem proposed these costs would continue to be recovered in the same way under the initial incentive scheme. Ofgem has also acknowledged that it will be appropriate to allow NGC to recover the internal costs that it has incurred in preparing for NETA⁶³ via the SO incentive scheme providing that these costs have been incurred efficiently. From 1 April 2001, Ofgem proposes expanding the SO incentive scheme to cover all of NGC's internal SO costs. This issue of internal SO costs is discussed further in the next section.
- 5.26 In summary, Ofgem proposes that the scope of the initial incentive scheme should cover:

⁶² The Net Imbalance Volume is primarily a function of participants' contracting decisions. If participants are fully contracted the Net Imbalance Volume will only reflect unanticipated plant failures or demand changes.

⁶³ NGC's costs in relation to the central BSC systems will be recovered via the BSC.

- ◆ Balancing Mechanism Costs (CSOBM⁶⁴) but with an adjustment to reduce NGC's exposure to the Net Imbalance Volume;
- ◆ Balancing Services Contract Costs (BSCC);
- ◆ Balancing Services Indirect Costs (currently known as Ancillary Services Overheads);
- ◆ Incremental TS Costs until 31 March 2001;
- ◆ Internal SO costs which are currently under the Price Control from 1 April 2001; and
- ◆ Internal NETA development costs relating to NETA.

NGC's View

5.27 NGC, in its response to the April Consultation, agreed with Ofgem that the initial incentive scheme should cover all energy and system balancing costs incurred given that these will represent the direct costs incurred in operating the system. In addition to the cost categories proposed by Ofgem, NGC suggested two more:

- ◆ the additional SO operational costs as a result of working in a post-NETA environment; and
- ◆ the internal costs relating to the development and ongoing activity associated with the procurement and development of balancing services.

5.28 NGC welcomed Ofgem's recognition that a sharper incentive scheme can be developed for the initial incentive scheme by reducing its exposure to the Net Imbalance Volume at an appropriate reference price. It believed that this approach is appropriate given the initial uncertainty with regard to the magnitude and volatility of the Net Imbalance Volume. However, NGC agreed with Ofgem that in the longer term it might be appropriate to increase its

⁶⁴ These are the costs NGC will pay daily to the BSCCo. for accepting bids and offers in the Balancing Mechanism. CSOBM will include the costs of both system and energy balancing actions taken in the Balancing Mechanism.

exposure to these costs in establishing the scope and form of the enduring incentive scheme.

Other Respondents' Views

- 5.29 Eighteen respondents to the April Consultation commented on the scope of the incentive scheme. Of these, ten were in favour of Ofgem's proposals. Four respondents were against the idea of NGC being incentivised on all the costs of energy balancing. Four other respondents provided comments but did not proffer an opinion.
- 5.30 One respondent believed that NGC should be incentivised on all system and energy balancing costs, and added that any other approach would be detrimental to the interests of all participants. Another respondent, however, believed that incentivising the SO on both energy and system balancing costs was contradictory and that such an incentive scheme would result in lower imbalance volumes and significantly weaker incentives for participants to self-balance. This respondent also argued that there was no economic justification for transferring part of the costs of both losses and system balancing to generators.
- 5.31 Thirteen respondents provided views on the proposal to reduce NGC's exposure to the Net Imbalance Volume. Ten respondents agreed with Ofgem's proposal to reduce NGC's exposure to the Net Imbalance Volume for the initial scheme. Five of these respondents acknowledged the difficulty of setting a suitable reference price. Three respondents argued that the approach was unnecessary.

Ofgem's Conclusions

- 5.32 Ofgem continues to believe that NGC should be incentivised on all system and energy balancing costs for the initial SO incentive scheme under NETA. We have also concluded that, for this initial scheme, NGC's exposure to the Net Imbalance Volume should be reduced. Careful consideration will need to be given to the choice of reference price. This issue is covered in Chapter 6.
- 5.33 Finally, with respect to the Ancillary Business Overheads and incremental TSU costs allowed under the current TSU incentive scheme, Ofgem continues to

believe that these should be recovered pro-rata under the initial incentive scheme under NETA.

The Treatment of SO Internal Costs

5.34 Currently, two sets of internal system operator costs are included within the SO incentive schemes:

- ◆ an allowance of approximately £5.6 million has been made for Ancillary Business Overheads for the period 1 April 2000 to 31 March 2001; and
- ◆ incremental SO costs currently allowed in the SO incentive scheme. These costs are additional SO operational expenditure not foreseen at the time of the setting the current transmission price control. For the period 1 April 2000 to 31 March 2001, Ofgem has made an allowance of £540,000 for operational expenditure incurred by NGC in its SO activities.

5.35 A much larger amount (approximately £50 million) associated with the fixed costs of system operation (system management costs and the costs of central NGC overheads allocated to the SO) is currently included in the main NGC price control.

5.36 In addition, NGC has identified two new cost areas associated with the new trading arrangements.

- ◆ NGC's internal NETA development and operational costs incurred prior to 1 April 2001; and
- ◆ NGC's internal NETA development and operational costs incurred after 1 April 2001.

April Consultation

5.37 In relation to the internal SO costs allowed under the current SO incentive schemes, Ofgem proposed that a simple pro-rata approach should be followed to determine what proportion of these costs remain to be recovered when the current schemes are terminated on the implementation of NETA. These

remaining costs would be recovered under the initial NETA scheme in the period up to 31 March 2001.

- 5.38 Ofgem proposed expanding the scope of the incentive scheme to include all internal costs relating to its SO activities (i.e. all costs associated with procuring and settling balancing services, core system management costs and continuing operational systems development) and so removed from the Transmission Price Control. This would have to be co-ordinated with equivalent changes to the RPI-X based main price control. The March 2000 Price Control Consultation document⁶⁵ proposed the separate identification of SO and TO costs within the Transmission Price Control that will make this possible. However, Ofgem noted that it was for further consideration whether and how these costs could be incentivised. These costs could be included in the sliding scale formulation, subject to (RPI – X) regulation or incentivised via a combination of the two methods. This issue will be considered in greater detail in the SO Price Review document due to be published in September.

NGC's View

- 5.39 NGC agreed with Ofgem's proposal that Ancillary Business Overheads and incremental TS costs should be recovered pro-rata under the initial incentive scheme. It also agreed that all SO costs should be recovered under the incentive scheme from April 2001 and that this should be co-ordinated with changes to the main Price Control.
- 5.40 NGC welcomed Ofgem's confirmation that its internal NETA development and operational costs will be recovered under the incentive scheme.

Other Respondents' Views

- 5.41 Fifteen respondents to the April Consultation commented on this issue. Of these, nine respondents agreed that it is appropriate to include all internal costs relating to its SO activities. Three respondents were against this idea for the initial SO scheme whilst three other respondents provided further comments. One respondent welcomed the separation of SO costs since it would facilitate the creation of an independent SO, should this be desired in the future.

⁶⁵ 'The transmission price control review of the National Grid Company from 2001, Initial thoughts consultation document, Ofgem', March 2000.

- 5.42 One respondent urged caution on this issue, and suggested that these costs should remain in the transmission price control until after at least two years of market operation to allow NETA to be tested and allow more appropriate incentives.

Ofgem's Proposals

- 5.43 Ofgem will seek to make a clear separation between the recovery and incentivisation of SO costs and the recovery and incentivisation of TO costs. In preparation, NGC has completed a business plan questionnaire setting out its internal SO costs, which is being reviewed by Ofgem.
- 5.44 Ofgem intends to publish initial proposals on the recovery and incentivisation of internal SO costs in September 2000, to complement the Transmission Price Control final proposals. In addition, this consultation will also cover the additional cost areas relating to NETA that NGC has identified. Ofgem then expects to be able to publish final proposals on the SO Price Review in January 2001 with a view to implementing separate arrangements from April 2001.

Bundled versus Unbundled Incentive Schemes

- 5.45 The July 1999 NETA document discussed the evolution of the current incentive schemes on NGC and the way in which these schemes have focused on the progressive unbundling of cost categories, with each cost category having its own incentive scheme. To date the unbundling of services and costs on which NGC as SO has been incentivised has been successful, in so far as it has attempted to target the costs over which NGC has some control and which it can therefore reduce. It has enabled the costs of system operation to be reduced and the key drivers of these costs to be better understood. Under NETA, NGC will have greater discretion as to how it procures the services it requires as SO. Thus, it will be even more important that NGC is consistently incentivised across all its purchasing activities.

Previous Consultations

- 5.46 For some time,⁶⁶ Ofgem has been arguing that the use of separate incentive schemes inevitably means that NGC will take actions designed to maximise its returns under the various incentive schemes rather than to improve efficiency overall, by reducing the total system operator costs. Consequently, we have proposed that there should be a single i.e. bundled incentive scheme under NETA.
- 5.47 Ofgem acknowledges that any perverse incentives to reduce one category of costs rather than another, could be reduced with unbundled incentive schemes (but not removed), by ensuring that each of the unbundled incentive schemes have consistent sharing factors and caps and collars. However, we do not consider that consistent sharing factors would entirely remove the possibilities for arbitrage.

NGC's View

- 5.48 NGC maintained that the existing unbundled schemes offer little opportunity for arbitrage. NGC believed by designing incentives with a sufficiently wide incentivised range, the incentive to minimise the overall cost can be maintained, and so their interests would be fully aligned with their customers.
- 5.49 Nevertheless, NGC acknowledged that there may be merit in bundling the incentives on it together in the longer term when balancing costs become more certain, but stated that for the initial scheme separate incentives should be retained on reactive power and transmission losses. NGC claimed this would ensure that, as the costs of reactive power and transmission losses can be expected to remain reasonably stable during the transition to NETA, the sharp incentives currently applied to these costs could remain, whilst allowing the incentives on the remaining costs to reflect the greater uncertainty attached to them.

Other Respondents' Views

- 5.50 Twenty two respondents to the April Consultation commented on this issue. Eleven respondents were in favour of Ofgem's proposal of a single (bundled)

⁶⁶ This point was first raised in the July 1999 NETA document.

incentive scheme. Two of these respondents were in favour of having a bundled scheme initially, but favoured a move back to unbundled incentive schemes in the future. One other respondent provided comments but did not express an opinion.

- 5.51 Ten respondents were in favour of retaining the current separate (unbundled) incentive scheme for the start of NETA. Many of these respondents wanted to retain the current arrangements, as they believed that they provide a degree of transparency that a bundled scheme would not.

Ofgem's Conclusions

- 5.52 Having carefully considered respondents' views to the April Consultation, Ofgem has concluded that there should be a single bundled incentive scheme at the start of NETA. This will ensure that NGC is consistently incentivised across all cost categories such that overall system and energy balancing costs are maintained at an efficient level and that there are no perverse incentives on NGC to reduce one category of costs over another. Ultimately, this will ensure that NGC's incentives are aligned with customers' interests.

Approach to Setting the Incentive Scheme Target

- 5.53 Under the current incentive schemes, an ex-ante forecast of costs is used as the basis for the incentive scheme target and NGC is incentivised on the difference between this ex-ante target and actual outturn costs.

Previous Consultations

- 5.54 In the December Consultation, Ofgem described three possible options for setting the incentive scheme target:
- ◆ the incentive scheme target could be based on an ex-ante target of the total balancing costs NGC might be expected to incur over a given period;

- ◆ NGC could be incentivised on ensuring that the price of its balancing actions was as close as possible to a reference price (either pre-determined or a dynamic reference price emerging from a power exchange), which would be set to reflect market conditions on the day; and
- ◆ NGC could be incentivised to minimise the volume of services it purchased at a pre-determined price.

5.55 Ofgem expressed a preference for the third option but, as noted above, accepted that this might not be appropriate for the initial incentive scheme.

5.56 In the April Consultation, Ofgem noted that some of the costs faced by NGC (for example, reactive power and black start) are unlikely to change substantially with the introduction of NETA and thus the parameters Ofgem has agreed with NGC relating to the incentive schemes to apply from 1 April 2000 should be taken into consideration for the initial SO incentive scheme under NETA. For other costs, such as reserve and response, where the volume of services required is likely to change with NETA, the April 2000 parameters remain a good basis from which to start our considerations.⁶⁷ Thus, Ofgem proposed that for the initial scheme, the incentive target should continue to be based on an ex-ante forecast of costs.⁶⁸

5.57 Ofgem believed that an initial bundled SO incentive covering all energy and system balancing costs including reactive power and transmission losses could be achieved by adding a cost allowance for reactive power and transmission losses to that for other balancing costs. For reactive power, this should be relatively straightforward since, under the current incentive schemes, Ofgem and NGC, already agree a cost based target for reactive power. In order to incorporate transmission losses, one possible approach would be to agree a specific volume target (as opposed to the range in the current incentive scheme) and a fixed price for losses, which, in combination, would give a cost target.

⁶⁷ It should be noted that other costs such as unscheduled availability payments borne by customers under the current arrangements will not exist in their current form under NETA. Whilst other means of valuing availability might emerge, this will be in response to the needs of participants and not part of a centrally administered payment mechanism.

⁶⁸ Ofgem noted that further consideration might be given to whether the ex-ante forecast agreed for the period covered by the initial scheme should be profiled over months, weeks or days with monthly, weekly or daily sharing factors to give shorter term incentive schemes.

NGC's View

- 5.58 NGC agreed with Ofgem that the incentive scheme should be based on a forecast of total balancing costs, and that an ex-ante forecast would represent the most appropriate and straightforward approach for the enduring incentive scheme.
- 5.59 NGC believes that not only is there considerable uncertainty regarding the likely level of Balancing Mechanism costs but also that these costs may be very volatile. Given this, NGC argued it would be extremely difficult to set an overall ex-ante target. If, for example, balancing costs were to fall outside the incentivised range within a short time, this would diminish or remove the incentive properties of the scheme for the remainder of the scheme period. Consequently, NGC proposed the use of a daily incentive target, with daily caps and collars. NGC believed this approach would ensure that its incentive is maintained throughout the initial scheme.

Other Respondents' Views

- 5.60 Eighteen respondents to the April Consultation commented on this issue. Twelve respondents broadly agreed with the proposal that an ex-ante forecast should be used for the initial incentive scheme. Three respondents did not think that this would be an appropriate method to use, and three further respondents provided comments.
- 5.61 One respondent believed that an ex-ante forecast of costs was the method to use for the initial incentive scheme because of the difficulties of establishing a target by an alternative method. Another respondent thought that the forecast target should be based on historic and existing costs as far as possible.
- 5.62 One respondent argued that the use of an ex-ante forecast would result in an incentive scheme which owes more to the accuracy of the initial cost forecast than to NGC's activities in managing the system, and believed more consideration should be given to the issue. Another respondent commented that it would like to see more detailed analysis of the activities to be undertaken by the SO before any decision is taken on whether an ex-ante forecast of total balancing costs is appropriate.

Ofgem's Conclusions

- 5.63 Ofgem has concluded that the initial incentive scheme should continue to be based on an ex-ante forecast of costs.
- 5.64 Ofgem understands the arguments that NGC has made in favour of a daily target with a daily cap and collar, but are not convinced that this approach is appropriate. Ofgem believes that the risks and uncertainties to which NGC might be exposed can be mitigated by reducing NGC's exposure to the Net Imbalance Volume and by an appropriate choice of sharing factors, caps and collars. We understand that daily caps and collars would further reduce the risk to which NGC is exposed but believe that it could provide NGC with a reduced incentive to control costs across the duration of the incentive scheme given that the focus under such arrangements will be on daily targets and incentive scheme payments. For example, an analysis of the pay-offs to NGC under daily and annual targets suggest that daily targets tend to produce higher pay-offs for NGC than annual targets for the same overall level of costs.
- 5.65 Thus, Ofgem continues to believe that an ex-ante forecast of costs for the duration of an incentive scheme remains an appropriate basis for setting the incentive scheme target. The incentive scheme target will be transparent to all, it will provide some indication of the likely level of costs to those that will ultimately bear them, and will represent a clear baseline against which the performance of the SO can be judged. However, given that the scheme will run for over a year, Ofgem proposes (see below) that the use of Income Adjusting Events should be retained for the initial scheme to allow, if necessary, for both upwards and downwards adjustments to the target value to be made.

Income Adjusting Events

- 5.66 Under the current TSU and RPU schemes, NGC has the right to ask Ofgem to consider resetting the parameters of the incentive scheme should a particular event (or series of events) occur.⁶⁹ Such an event must be deemed to be outside of NGC's control and also an event which results in a greater than £2 million increase or decrease in TSU or RPU.

⁶⁹ LC A4(10) defines the circumstances under which NGC's income from the current TSU and RPU incentives schemes could be adjusted up or down.

April Consultation

5.67 In the April Consultation, Ofgem noted that the provision for Income Adjusting Events provides protection for both NGC and customers in the event that an unforeseen incident results in extreme costs or unforeseen benefits. Ofgem believed further consideration needed to be given as to whether these arrangements should be taken forward in the new incentive schemes under NETA.

NGC's View

5.68 In its response to the April Consultation, NGC argued that Income Adjusting Events allow the risk of a number of highly unlikely, but extremely costly events to be excluded when considering an appropriate target for the incentive scheme. It argued that the risk exposure to such events is effectively removed from the scheme, allowing a more challenging incentive scheme target to be set.

5.69 NGC argued that income adjusting provisions are an essential part of the incentive scheme design given that significant costs or windfall savings can arise from events outside its control and hence that they should be retained for the initial SO incentive scheme under NETA.

Other Respondents' Views

5.70 Fourteen respondents to the April Consultation commented on this issue. Of these, only four respondents thought provisions should be made for Income Adjusting Events. Nine respondents believed that they were unnecessary and one other respondent commented but did not express an opinion.

5.71 One respondent agreed with Ofgem's view and further stated that the number of events able to trigger an income adjustment should be as few as possible and limited only to extreme situations.

5.72 Two respondents thought that appropriate sharing factors, caps and collars and the correct target should enable NGC to mitigate its risk. One respondent said that it did not support the provision for Income Adjusting Events, although emergencies should continue to be accommodated.

Ofgem's Proposal

- 5.73 Ofgem believes that, given the uncertainties inherent in setting an incentive scheme before the start of NETA, the provision for Income Adjusting Events continues to be appropriate and proposes that it is retained for the start of NETA. However, we continue to believe that an enduring incentive scheme should contain no provisions for Income Adjusting Events and the provision for Income Adjusting Events will be reviewed when we consider the enduring SO incentive scheme under NETA.
- 5.74 Ofgem will continue to examine the drafting of the licence conditions related to Income Adjusting Events to ensure that the scope of the provisions is appropriate and that it offers sufficient scope for both NGC and the Director General (on behalf of other participants) to call an Income Adjusting Event.
- 5.75 Ofgem's preliminary view is that the current threshold of £2 million be retained in a post-NETA environment.

Conclusions and Views Invited

- 5.76 In conclusion, Ofgem believes that the initial SO incentive scheme under NETA should cover all energy and system balancing costs including reactive power and transmission losses, subject to reducing NGC's exposure to the Net Imbalance Volume at a reference price. Ofgem proposes that there should be one bundled incentive scheme and the incentive scheme target should be based on an ex-ante forecast of total balancing costs. The initial SO incentive scheme should continue to take a sliding scale form and it should have a duration from the introduction of NETA to the 31 March 2002. The draft changes to NGC's Transmission Licence required to effect the form, scope and duration of the initial SO incentive scheme under NETA are presented in Appendix 6.
- 5.77 Although Ofgem has reached final views on many of the issues covered in this chapter, we invite views on:
- ◆ the treatment of SO internal costs; and
 - ◆ Income Adjusting Events.

6. Parameters of the SO Incentive Scheme under NETA

Introduction

- 6.1 This chapter presents Ofgem's initial proposals on the following parameters for the initial SO incentive scheme under NETA:
- ◆ the target cost;
 - ◆ the sharing factors, cap and collar;
 - ◆ the reference price to be used in reducing NGC's exposure to the Net Imbalance Volume; and
 - ◆ the treatment of SO operational expenditure.
- 6.2 NGC has provided us with its views on what balancing costs may be under NETA and hence its proposals for the incentive scheme parameters. Our views have been developed in the context of NGC's submission.
- 6.3 The parameters discussed in this chapter need to be considered in relation to the decisions that Ofgem has reached on the form, duration and scope of the initial SO incentive scheme (presented in Chapter 5). We have concluded that the initial SO incentive scheme should:
- ◆ cover all energy and system balancing costs;
 - ◆ be a single bundled incentive scheme;
 - ◆ have an incentive scheme target set ex-ante for the duration of the scheme;
 - ◆ take a sliding scale or profit sharing form; and
 - ◆ begin on the introduction of NETA and end on 31 March 2002.
- 6.4 Given our decision on the scope of the incentive scheme, the target cost will need to incorporate a forecast of the costs of the following energy and system balancing services:

- ◆ energy (including forward energy contracts);
- ◆ reserve;
- ◆ frequency response;
- ◆ transmission constraints;
- ◆ black start;
- ◆ reactive power; and
- ◆ transmission losses. Although this is not a cost to which NGC is exposed, NGC will be incentivised to minimise the volume of transmission losses at a reference price.

6.5 The costs incurred in procuring and utilising these services will fall into two main categories:

- ◆ **Balancing Services Contract Costs (BSCC):** These are the costs of the payments that NGC will make to the providers under contract of the balancing services listed above, excluding any costs paid through the Balancing Mechanism.⁷⁰
- ◆ **Balancing Mechanism Costs (CSOBM):** These are the costs NGC will pay daily in accordance with the Balancing and Settlement Code for accepting bids and offers in the Balancing Mechanism.

The Impact of NETA on the Volume and Price of Balancing Services – the April Consultation

NGC's View

6.6 In the April Consultation, we presented some initial views that NGC has developed on its likely requirements for balancing services and the key drivers of its costs. Since then, NGC has slightly revised its view of the volumes of

⁷⁰ NGC may, from time to time, purchase energy in forward markets under NETA for the purpose of balancing the system. The cost of these purchases will also be a balancing service contract cost.

balancing services it will require (see section on Incentivised Target below) but its views of the drivers of volumes and costs have not changed.

6.7 NGC argued that there are three main drivers of the volumes of reserve and response that it will be necessary to hold:

- ◆ **Intra half-hour adjustments:** Under NETA, generator bids and offers will be firm so there will be financial incentives for participants to balance at the half-hourly level. NGC argues that this creates an incentive for intra half-hour adjustments in order to achieve balance by the end of the half-hour period. NGC believes that this will mean the minute-by-minute balance of demand and generation will be made more difficult. In order to counteract this effect, NGC argues it will have to increase the level of dynamic frequency response it holds;
- ◆ **NGC's demand forecasting error:** The standard deviation of NGC's demand forecast error at 3 ½ hours ahead of real time is currently 1%. It expects this will increase under NETA due to increased demand side responsiveness to price signals. This will have to be managed by holding more regulating reserve; and
- ◆ **Profiling uncertainty:** NGC expects high levels of energy imbalances to occur during shoulder periods when demand changes rapidly with considerable daily variations in profile. NGC expects this to continue until market participants gain experience under NETA and this will also require it to hold additional regulating reserve during these periods.

6.8 NGC told Ofgem that NETA would not influence the volume of black start capability or reactive power that it needed to procure. It also did not believe that NETA would have a significant impact on the volume of transmission constraints. In addition, NGC argued that the volume of energy balancing that would be required was very uncertain.

6.9 NGC told Ofgem that the price of balancing services under NETA would depend on two factors: the pattern of bid and offers in the Balancing Mechanism and balancing services contract prices.

6.10 In relation to bid and offer structures, NGC believed that the following factors would be relevant considerations:

- ◆ participants will be able to offer different prices in different markets i.e. Balancing Mechanism bids and offers could be different from prices seen in forward energy markets;
- ◆ participants will be able to change the price of bids and offers submitted in the Balancing Mechanism from period to period to reflect changing system conditions; and
- ◆ there will be no cap on the price of bids or offers submitted in the Balancing Mechanism.

6.11 In relation to the costs of balancing services contracts, NGC believed that three effects would influence the prices offered for the provision of such services:

- ◆ the higher volume of reserve that NGC expects to require could increase its price;
- ◆ prices for frequency response could increase as participants internalise their expected exposure to imbalance prices as a result of providing response via their bids and offers; and
- ◆ greater transparency in the prices paid by NGC for balancing services could lead to participants extracting the maximum value for the service they offer by bidding up to the price of the most expensive service provider.

6.12 In addition, NGC believed that the removal of the capacity payments mechanism and hence unscheduled availability (USAV) payments could lead to an increase in energy prices overall as participants internalise their fixed costs in the bids/offers submitted to the various markets.

6.13 Overall, NGC believed that both the price and volume of balancing services required under NETA will increase. NGC acknowledges that an increase in competition may offset these trends to an extent, but considered that there would still be upward pressure on balancing costs.

Ofgem's Initial View

- 6.14 Ofgem agreed with NGC and other participants that, at least initially under NETA, there may be a need to hold some additional response and reserve. Ofgem believed that it should be possible to reduce any additional holding of reserve and response for the introduction of NETA over time, as experience of trading under NETA is achieved. Ofgem thought that the volume drivers under NETA warranted further consideration to ensure that the additional requirements were justified, and that there was no double counting between drivers.
- 6.15 In relation to the drivers of prices under NETA, Ofgem's initial view was that whilst generators and demand would naturally try to extract the highest possible value for the service they provide, there are, equally, drivers that are working to reduce wholesale prices across the range of services that generators and demand offer. Ofgem believed increasing competition across the supply curve could lead to falling prices for utilising response and reserve. Ofgem stated that given recent experience of prices under the Pool, it is apparent that the shape of the supply curve needs to be taken into consideration when determining a target for the incentive scheme.

Respondents' Views

- 6.16 Eighteen respondents to the April Consultation commented on this issue. All of the respondents believed that initially under NETA, an increase in the volume of balancing services procured by NGC would be acceptable. Of these, thirteen respondents believed the initial estimates of the increase in volume of balancing services required was too large. Two further respondents suggested that more information would be required before any proposed volume increases could be agreed. Three further respondents commented that they agreed with NGC's views on the volume of balancing services required.
- 6.17 Five respondents commented that although initially under NETA, the volume of reserve and response required should increase, the volume procured initially under NETA should be reduced once experience of operating under the new trading arrangements has been gained. One of these respondents believed there were no grounds for certainty that prices charged by generators and demand for balancing services will increase under NETA. One respondent thought that

NGC's forecasts should be seen as a worst case scenario, whilst another believed the proposed requirement greatly exaggerated the actual requirement, and so should be appraised critically.

- 6.18 One respondent commented that any sustained increase in the cost of balancing services should lead to a review of the way in which balancing services are procured. Another respondent argued that balancing services costs may also rise as the operators of flexible plant seek appropriate remuneration for the services they provide, although competitive pressure will mean this should be a short term phenomenon.
- 6.19 One respondent was sceptical that NGC's demand forecast will become less reliable under NETA and argued that the SO should have a good idea of total demand well before Gate Closure and with a great deal of certainty once FPNs are submitted 3 ½ hours before real time. Another respondent added that it would expect NGC's demand forecasting techniques to adapt to the new environment as NGC becomes accustomed to the accuracy of the FPNs.
- 6.20 One respondent believed that the overall costs of system balancing will increase under NETA, which is partly due to a function of the removal of the Pool (which it believed cross subsidises system balancing costs) and partly due to the lower efficiency of participants self-balancing. Another stated that the increase in costs reflected the increase in risk of procuring these services under the new environment.
- 6.21 Lastly, two other respondents argued that one of the advantages of NETA is to encourage, and reward, a much greater amount of genuine demand participation in the wholesale market, thereby reducing the need for reserve.

Incentive Scheme Target

- 6.22 NGC has presented Ofgem with a forecast of balancing costs under NETA and its proposals for the incentive scheme target. This section presents the assumptions behind NGC's forecast of balancing costs and its key results.
- 6.23 NGC has developed new forecasting tools and models to analyse the Balancing Mechanism and other NETA markets. Inevitably, the absence of historic data makes forecasting balancing costs under NETA a difficult and uncertain task.

NGC's projections have a very wide range associated with them, given the uncertainty. Ofgem recognises the uncertainties under which NGC's modelling has been undertaken. Ofgem's sensitivities on NGC's analysis give very different cost forecasts.

NGC's Forecast of Balancing Services Costs under NETA

- 6.24 For the reasons outlined above, NGC believes that the volumes of response and reserve that it holds will need to increase at least initially under NETA whilst it and participants gain experience.
- 6.25 In relation to the three main drivers of the volumes of reserve and response that NGC has identified, NGC has estimated that following additional volumes of balancing services will be required initially:
- ◆ **Intra half-hour adjustments:** NGC considers that it will need to increase the level of dynamic frequency response it holds by 22% or 200MW (from 8 TWh/year to 9.8 TWh/year).
 - ◆ **NGC's demand forecasting error:** NGC expects the standard deviation of its demand forecast error at 3 ½ hours ahead of real time to increase from 1% to 1.3%. It proposes to manage this by holding between 60MW and 150MW more regulating reserve.
 - ◆ **Profiling uncertainty:** To counter this, NGC expects to hold a further 500MW to 1000MW of additional regulating reserve during these periods.
- 6.26 Overall, NGC expects to increase regulating reserve holding by 33% to cater for the increased uncertainty under initial NETA. As a result of these increases in reserve and response holdings, it also expects to increase the level of contingency reserve by approximately 17% (500 MW). NGC expects to require additional holdings at these levels for the first four months of NETA i.e to 31 March 2001, thereafter it considers it will be possible to reduce its reserve holdings broadly back to current levels over the remaining 12 months. On an average basis across the period 1 April 2001 to 31 March 2002, this profiling corresponds to holding about half the additional volume of contingency reserve

and a third of the additional regulating reserve originally proposed by NGC.

However, NGC does not anticipate reducing its response holdings.

6.27 Table 6.1 summarises NGC's views on the volumes of balancing services it will need to hold initially under NETA.

Table 6.1. Balancing Service Volumes under NETA

Service	Current Holding	Initial Increase in Service	Conversion of Initial Increase to Annual Equivalent	% Increase to 31 March 2001	% Increase from 1 April 2001 to 31 March 2002
Response	8 TWh	+ 200MW of response	$200\text{MW} \times 8760\text{hr} = +1.8 \text{ TWh}$	+ 22%	+ 22%
Regulating Reserve	6 TWh	+ 60-150MW of regulating reserve	$90\text{MW (av.)} \times 8760\text{hr} = +0.8 \text{ TWh}$	+ 33%	+ 11%
		+ 500-1000MW of regulating reserve at shoulders	$3\text{hr} \times 500\text{MW} = +1.5\text{GWh /day}$ $2\text{hr} \times 1000\text{MW} = +2\text{GWh /day}$ so $+3.5\text{GWh} \times 365\text{days} = +1.2\text{TWh}$		
Fast Reserve	3 TWh	None		0%	0%
Standing Reserve	7 TWh	None		0%	0%
Contingency Reserve	3000 MW /day	+ 500 MW /day	n/a	+ 15%	+ 8%
Black Start		None	n/a	0%	0%
Reactive Power	Approx. 33 TVARH	None	n/a	0%	0%

Balancing Services Contract Costs

6.28 Based on its estimates of the necessary volumes of balancing services contracts and the drivers of prices of balancing services contract costs (discussed in the previous section), NGC has created an overall forecast of these contract costs.

NGC has told Ofgem that it expects the contract costs of the following balancing services to be affected by NETA:⁷¹

- 6.29 **Reactive Power:** NGC has assumed that there will be no change in the cost of reactive power under NETA.
- 6.30 **Response:** NGC is expecting to increase the volume of total response holding by 22%. NGC expects NETA to increase energy market liquidity. Firm response contracts are normally backed by energy contracts, and NGC expects NETA to allow it to purchase contracts that better meet its requirements.
- 6.31 **Refund of Response Imbalance Charges:** The provision of mandatory frequency response and intertrip services will result, under NETA, in the service provider being exposed to imbalance charges. This is because delivery of the service results in the BM Unit moving away from its FPN without the acceptance of a bid or offer.
- 6.32 NGC has agreed to refund imbalance charges arising due to the provision of response. To estimate the imbalance refund NGC has estimated the difference between the System Buy Price (SBP) and the System Sell Price (SSP). NGC's initial estimate is that the response imbalance refund could be between £11k/day and £55k/day depending on the range of SBP minus SSP as estimated by NGC in its forecast of Balancing Mechanism costs.
- 6.33 **Standing Reserve:** The closing date for standing reserve tenders for the first months of NETA was 30 June 2000. NGC has now concluded its standing reserve tender assessment. NGC has told Ofgem that tender prices were higher than anticipated, and NGC has only offered contracts for around 1000MW of plant (compared to 1900MW in the current year) with the rejection of a number of uneconomic tenders. Taking account of higher utilisation prices for plant that has been offered contracts, and the plant without contracts that will need to be procured via the Balancing Mechanism, NGC now expects costs for standing reserve to increase on average by £21k per day. This represents a 60% increase over the current cost of this service but with only half the contracted volume. It

⁷¹ Under NETA, Regulating Reserve will be delivered by the acceptance of Bids and Offers in the BM. The change in volume of Regulating Reserve impacts on the costs of the BM, but has no direct impact on balancing services contract costs.

believes this will also have a consequential impact on regulating reserve volumes.

- 6.34 **OCGT Fast Start:** NGC has assumed there will be no change in the costs of the contracts that it holds with OCGTs.
- 6.35 **Contingency Reserve:** contingency reserve is currently provided by the cancelled start and hot standby services. Under NETA, NGC expects the same functionality to be delivered by the warming service. At least initially, NGC is planning to increase its holding of this service by 17%. NGC also argues that a proportion of its existing contingency reserve has a notice to deviate from zero time (NDZ) greater than 3½ hours and hence it will have to re-contract with participants who have shorter NDZs, probably at a higher price. At present, NGC has only discussed with service providers the form of contracts under NETA and not prices or service enhancement. However, it is NGC's expectation that the enhanced service requirement, combined with the extra holding may result in cost increases.
- 6.36 **Constraint Contracts:** As at present, NGC does not intend to enter into any constraint contracts.
- 6.37 **Black Start:** It is NGC's current view that participants negotiating black start contracts will attempt to recover some of the loss of capacity and USAV payments under NETA.
- 6.38 Overall, NGC's forecast of Balancing Services Contract Costs is shown in Table 6.2.

Table 6.2: Forecast Daily Balancing Services Contract Costs

Cost Category	Current Daily Cost	NGC Forecasts		
£k/day		Low Forecast	High Forecast	Mean Forecast
Reactive Power	127	127	127	127
Reserve ⁷²	100	111	150	131
Response	129	130	151	142
Other Balancing Services	37	48	97	73
Total	393	416	525	472
Total (£m)	0.39	0.42	0.53	0.47

Balancing Mechanism Costs

- 6.39 NGC has constructed a simulation model of the Balancing Mechanism (Simulation Assessment and Review of Balances or SARB), that it used to construct a probability distribution for Balancing Mechanism costs, based on simulation of the behaviour of participants in the NETA markets. In broad terms, SARB models Balancing Mechanism costs based on a snapshot of the system at given times of the year, modelled to a genset level and based around a number of sensitivities and scenarios designed to capture the inherent uncertainty associated with many of the Balancing Mechanism cost drivers.
- 6.40 NGC has attempted to capture all the information required to calculate the Balancing Mechanism cost. The balancing services contract volume drivers, outlined earlier, are an input into this model, but the costs of balancing services contracts are additive to forecast Balancing Mechanism costs discussed below. In addition, inputs to SARB include estimates of the imbalance volumes, the shape of the bid and offer supply curves and a number of other uncertainties.
- 6.41 The outputs of the model include estimates for the daily volume of bids and offers purchased, the imbalance prices and a distribution of costs incurred in the Balancing Mechanism. NGC has used scenarios and random sampling to develop a distribution of Balancing Mechanism costs.

⁷² This represented NGC's estimate before the recent Standing Reserve tender.

6.42 NGC has modelled four main Balancing Mechanism volume and price drivers:

- ◆ price scenarios covering drivers of bid and offer prices in the Balancing Mechanism;
- ◆ imbalance volume scenarios – voluntary imbalance positions taken by participants in the Balancing Mechanism i.e. how much energy is left to be traded in the Balancing Mechanism or settled at imbalance prices;
- ◆ post Gate Closure volume variables; and
- ◆ additional factors.

6.43 Each of these is considered in turn below.

Price Scenarios

6.44 NGC has identified seven key factors that it believes capture the interactions between behaviour in the Balancing Mechanism and other markets under NETA:

- ◆ **Energy Market Prices:** Prices in forwards markets which influence the prices that participants wish to achieve in the Balancing Mechanism i.e. the extent to which they seek to recover their fixed costs;
- ◆ **Balancing Mechanism Pricing Strategy:** The level of costs that NGC has assumed will be recovered through Balancing Mechanism bids/offers;
- ◆ **Plant Operation:** The way in which generators spread running (operation) across the units within a station and across stations. For example, with two units a generator could either contract for the output of one unit and bid the other into the Balancing Mechanism (unstraddled) or the contract could be spread across both units, with half the capacity of each participating in the Balancing Mechanism (straddled). Similarly, different approaches can be adopted for recovering fixed costs across units. This influences the level of costs generators seek to recover in the Balancing Mechanism and the spread of bids and offers they submit;

- ◆ **Balancing Mechanism Liquidity:** Number of participants actively submitting bids/offers in the Balancing Mechanism, which NGC assumes will influence the shape of supply curve;
- ◆ **Market Player Forecast Ability:** Relates to the sophistication of Balancing Mechanism participants and manifests itself as a risk premium on top of cost based bids/offers;
- ◆ **Balancing Mechanism Price Volatility:** NGC believes that price volatility in the Balancing Mechanism will be linked to liquidity in the Balancing Mechanism i.e. low liquidity would result in more volatile prices and
- ◆ **Sleeper Bids:** NGC believes that the submission of "Sleeper Bids" - very high bids/offers – will also relate to liquidity in the Balancing Mechanism. For example, non-active participants might choose to submit such sleeper bids.

6.45 On the basis of these drivers, NGC has developed four price scenarios. In each, NGC assumes there is little or no demand side participation in the Balancing Mechanism. NGC's scenarios are summarised in Table 6.3.

Table 6.3: Balancing Mechanism Price Scenarios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Energy Market Prices	Very Low	Low	Low	Very Low
BM Pricing Strategy	Recover pure short run marginal costs	Recover short run marginal costs & residual fixed costs	Recover short run marginal costs & pro-rated fixed costs	Recover short run marginal costs, residual fixed costs & contribution to corporate overheads
Plant Operation	Highly straddled	Partially straddled	Marginal plant unstraddled	Marginal plant unstraddled
BM Liquidity	Very Competitive	Fairly Competitive	Fairly Competitive	Limited Competition
BM Price Volatility	<i>Low Volatility</i>	<i>Volatile</i>	<i>Volatile</i>	<i>Very Volatile</i>
Sleeper Bids (exc. Nuclear)	<i>None</i>	<i>Few</i>	<i>Few</i>	<i>Many</i>
Market Player Forecast Ability	All perceptive and accurate	Some perceptive and accurate	Few perceptive and accurate	Few perceptive and accurate
Probability	5%	45%	40%	10%

- 6.46 Scenario 1 represents a situation where there is intense competition and bids and offers in all the NETA markets reflect only short run marginal costs. NGC believes extreme competition would cause significant increases in Balancing Mechanism volumes and in the long term would force out excess market capacity. NGC believes that this scenario is unlikely and could only be sustainable in the short term.
- 6.47 Scenarios 2 and 3 both model less extreme market conditions, with bids and offers reflecting marginal costs, start up and no-load costs and a proportion of station fixed costs. The scenarios differ in the extent of generator straddling and the sophistication used by participants in seeking to recover their fixed costs (scenario 2 assumes greater sophistication than scenario 3). NGC believes both scenarios are sustainable in the long term.
- 6.48 Scenario 4 represents a market in which there are few active Balancing Mechanism participants, due in part to the overheads of trading and the cost of developing systems to operate in tight time-scales. As a result, many participants are able to factor corporate costs, as well as variable and fixed costs, into their bid and offer prices. NGC believes this is unlikely to be sustainable in the long term, but is credible initially under NETA.

Imbalance Volume Scenarios

- 6.49 Table 6.4 below, summarises the assumptions made by NGC on the voluntary imbalance positions taken by participants in settlement under NETA. NGC has assumed that voluntary imbalances will at most amount to 2% of total demand and has assigned probabilities to whether the system overall will be long, short or balanced. NGC considers that the financial consequences of being under-contracted and exposed to the SBP are likely to be greater than those from being over-contracted. Consequently, it has assumed that the chance that the system will be over-contracted (i.e. long) is greater than it being under-contracted (i.e. short).

Table 6.4: Imbalance Volume Scenarios

Scenario	Imbalance Volume (Percentage of Demand)	Probability
1 Long	-2%	40%
2 Balanced	0	40%
3 Short	+2%	20%

Post Gate Closure Volume Variables

6.50 NGC has modelled three other drivers of volumes in the Balancing Mechanism, reflecting uncertainties it perceives will exist after Gate Closure, as shown in Table 6.5. The values for plant breakdown and under/over generation (against despatch schedules) have been taken from analysis of historic Pool data whilst the demand forecasting error reflects NGC's view, discussed above, that greater demand-side responsiveness to price signals will lead to greater uncertainty over the level of demand.

Table 6.5: Post Gate Closure Variables

Variable	Value
Plant Breakdown	450 MW
Demand forecasting error	1.3%
Under/Over generation	80 MW

Additional Factors

6.51 At the start of NETA, transmission constraints will be resolved by NGC through the acceptance of Balancing Mechanism bids and offers. NGC has modelled additional constraint volumes in the Balancing Mechanism and prices these using a national merit order i.e. it takes no account of participants behind constraints adjusting their bids or offers to increase their revenues. NGC believes that this form of modelling underestimates the locational cost of constraints. NGC has estimated the additional constraint-related costs that need to be included in the forecast of Balancing Mechanism costs by estimating the difference between forecast prices associated with plant it has forecast to be constrained on/off in the Balancing Mechanism and its national prices.

6.52 NGC has assumed that 450 MW of plant will breakdown after Gate Closure and thus be unavailable for participation in the Balancing Mechanism. However, plant breakdown before Gate Closure has not been captured within the central features of NGC modelling. This is due to the modelling difficulty of ensuring consistency between assumed contracted energy positions and plant availability. NGC has argued that historically unplanned outages before Gate Closure run at approximately 8% and it believes that unplanned outages provide an upward driver of costs since it increases the bid and offer merit order. This impact of unplanned outages (before Gate Closure) has been modelled by reducing all genset registered capacities (and stable export limits) by their average unplanned outage rate.

NGC's Forecast of Balancing Mechanism Costs

6.53 Taking the assumptions discussed above, NGC has produced a forecast of Balancing Mechanism costs based on the mean of the probability distributions that it has created, as shown in Table 6.6.

Table 6.6: Forecast Daily Balancing Mechanism Costs (£m/day)

£m/day	NGC Forecast	
	Stan.Dev	Mean
SARB Modelled BM Costs		1.08
Constraint Locational Pricing		0.03
Unplanned outages		0.11
Total	0.71	1.23

6.54 Overall, NGC estimates that it will incur mean costs in the Balancing Mechanism amounting to some £1.23 million per day. NGC believes that the distribution of these costs has a standard deviation of £0.71 million but that the distribution is significantly skewed. The 90% confidence interval associated with the distribution is £0.52 million/day and £2.52 million/day. This indicates that a 1% increase in the probability of costs exceeding any given level equates to a much large change in absolute costs than a 1% decrease in probability.

Adjustment for Net Imbalance Volume

- 6.55 Ofgem has proposed reducing NGC's exposure to the Net Imbalance Volume. In order to set an incentive scheme target, the cost of the Net Imbalance Volume at a reference price must be deducted from the total Balancing Mechanism costs presented in Table 6.6.
- 6.56 NGC has proposed that the reference price should be set to the SBP when the system is short of energy and to the SSP when the system is long on energy. Using this assumption, NGC has calculated a mean Net Imbalance Volume adjustment of £0.54 million/day leading to incentivised Balancing Mechanism costs of £0.69 million/day.⁷³

Treatment of Transmission Losses

- 6.57 As under the current incentive arrangements, NGC will also be incentivised to minimise the volume of transmission losses by the use of a target cost constructed from a volume target and a reference price. NGC has taken its forecasts for both the volume and the reference price from the Pool scheme parameters. The Pool scheme has monthly profiling factors, which are derived directly from the historic outturns of the previous 3 years, and NGC has taken the factors for the winter months in combination with the mid-point of the target range (5.23 TWh) to give a daily target volume of transmission losses of 16.06 GWh (which equates to 5.84 TWh on an annual basis).
- 6.58 Multiplying this volume by £25/MWh, the price in the Pool scheme, gives a daily target for transmission losses of £0.40 million.

Summary of NGC's Proposal

- 6.59 Table 6.7 summarises NGC's estimate for the total daily incentivised costs.

⁷³ It should be noted that the incentivised Balancing Mechanism cost for NGC will need to be considered in the light of the reference price that is ultimately chosen. For example, a reference price of £20/MWh across the period as opposed to a reference price based on SBP and SSP would increase NGC's forecast of incentivised Balancing Mechanism costs from £0.69 m/day to £0.94 m/day.

Table 6.7: Forecast of total incentivised costs

Cost Category		Mean Forecast Cost
Incentivised Balancing Mechanism	£m/day	0.69
Balancing services contract cost	£m/day	0.47
Transmission Losses	£m/day	0.40
Total Daily Incentivised Costs	£m/day	1.56
Total Annual Incentivised Costs	£m/annum	569

6.60 Overall, NGC has proposed an incentive scheme target of £1.56 million/day or £569 million per year for the initial SO incentive scheme under NETA.

Ofgem's Initial Proposals

6.61 Ofgem believes that the work NGC has undertaken to model balancing services costs under NETA has been useful and instructive. However, we believe that there are a number of areas in which NGC has been overly pessimistic in the assumptions it has made and where a target based on NGC's forecast would not represent an appropriate balance between risk and reward i.e. the likelihood that costs could be higher or lower would not be equal.

Balancing Services Contract Costs

6.62 With respect to NGC's explanation of its forecast of balancing services contract costs, Ofgem believes that there are four main areas in which NGC's forecast of balancing services costs has been overly pessimistic.

6.63 First, although we accept NGC's proposals for additional volume for the period between NETA Go Live and 31 March 2002, we consider thereafter there may be scope for more rapid reductions than NGC has proposed:

- ◆ on intra-half hour adjustments and profiling uncertainty, we consider that individual adjustments made by participants will net-off, to an extent, at a system level resulting in the overall impact of these drivers being lower than NGC suggests. Furthermore, Grid Code obligations prevent participants from deliberately deviating from FPNs in order to minimise intra-half hour imbalances;

- ◆ the increase in expected demand forecasting errors due to additional demand side participation seems incompatible with NGC's assumption that there will be little increase in demand side participation. For example, if the demand side is more responsive to price signals then it is more likely to participate in the Balancing Mechanism rather than attempting unilaterally to respond to price signals after Gate Closure;
- ◆ a large increase in the volume of response and reserve could result in a reduced incentive for participants to self balance due to the combined effects of the smearing of reserve contract costs and tagging on dampening energy imbalance prices; and
- ◆ with regard to contingency reserve, Ofgem expects that market participants, will want to warm plant of their own accord in order to ensure that they are able to participate in short term energy markets in a flexible manner. If plant do not do this then they will be unable to sell their electricity anywhere other than in the Balancing Mechanism. Thus, there may be no need for NGC to pay plant to warm in timescales longer than 3 ½ hours.

6.64 Thus, Ofgem proposes to allow NGC the increased volumes of response and reserve it has suggested initially (from Go Live to 31 March 2001). For the period 1 April 2001 to 31 March 2002, we believe that the balancing performance of participants should have improved and that NGC will then have had four to five months of experience in operating under NETA. Thus, we suggest that a low estimate would be that no additional holdings of response or reserve should be allowed with a high estimate equal to NGC's proposals (see Table 6.9).

6.65 To the extent NGC chooses to hold more response and reserve in this second period, then it will need to look at the trade-off between the increase in balancing services contract costs as a result of doing this versus the potentially lower costs incurred in the Balancing Mechanism through contracting for reserve and response ahead of Gate Closure.

Table 6.9: Ofgem’s Initial Views on the Volume of Response and Reserve – averages across periods

	NGC Proposed Increase		Ofgem’s Initial Proposal	
	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Go Live to 31 March 2001	1 April 2001 to 31 March 2002 ⁷⁴
Response	+22%	+22%	+22%	+0 - 22%
Regulating Reserve	+33%	+11%	+33%	+0 - 11%
Contingency Reserve	+15%	+8%	+15%	+0 - 8%

6.66 Second, Ofgem believes that NGC has been overly pessimistic concerning increases in the prices of balancing services under NETA. Whilst it is inevitable that service providers will attempt to extract the highest price possible for the service provided, Ofgem believes that the cost target should incentivise NGC to reduce the effect of upward price drivers (through contract negotiations and adopting a range of contracting strategies). Indeed, it is for precisely this reason that NGC has been given discretion in how it balances the system. Furthermore, whilst participants might attempt to recover revenues lost as a result of the removal of USAV and indeed, to compensate more generally for the fall in prices indicated by Electricity Forward Agreement (EFA) prices, we believe that NGC has overestimated the potential for participants to recover these costs given increasing competition. In addition, there is an inconsistency between assuming that it is economic for NGC to purchase a large quantity of reserve and assuming that all plant bidding into the Balancing Mechanism attempt to recover all their fixed costs from Balancing Mechanism acceptances. Thus, we consider that NGC may have overestimated the prices of fast reserve, standing reserve, contingency reserve and firm response.

6.67 Third, NGC has forecast a range of £11k to £55k per day for the costs of response imbalance refunds. This is significantly at variance with earlier indications from NGC that the response imbalance refund was likely to be

⁷⁴ The higher values correspond to an increase in response of 100 MW, for regulating reserve it should be 100 MW across all periods plus 500 MW for shoulder periods and that for Contingency Reserve 250 MW. This corresponds, broadly, to the average of NGC’s profiling of its additional reserve holding.

relatively small. Ofgem believes an allowance for these costs towards the low end of this range might be appropriate.

6.68 Fourth, in relation to the costs of black start, under the TSU incentive scheme for 2000/01, Ofgem made an allowance of £10 million or £27k/day. NGC's mean forecast for the costs of black start is £38k/day. Whilst, this is consistent with a rise of up to £5k/day assumed by NGC over its estimate of the current costs of black start (£35k/day), Ofgem believes that any rise in the costs of black start should be against the allowance made by Ofgem for the TSU incentive scheme.

6.69 In summary, Ofgem believes that given the initial uncertainty under NETA it would be prudent to include an allowance for NGC to hold some additional response and reserve. However, whilst accepting NGC's figures for additional response and reserve in the period to 31 March 2001, we do not agree that it is necessarily the case that the increase in volume of response and reserve should be as large as NGC has suggested beyond 31 March 2001 and at the low end of our range we assume no additional volumes will need to be held after 1 April 2001. Ofgem is also not convinced by NGC's arguments over the price of balancing services. Overall, we propose alternative views for the allowance for balancing services contract costs as in Table 6.10 below. They represent a reduction of up to 13% until 31 March 2001 and a 7-17% reduction thereafter.

Table 6.10: Ofgem's Initial View on Balancing Services Contract Costs

	NGC's View		Ofgem's Initial View	
	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Go Live to 31 March 2001	1 April 2001 to 31 March 2002
Balancing Contract Cost Allowance £m/day	0.47	0.47	0.41 – 0.47	0.39 – 0.44
Total (£m)	61	173	54 – 61	143 – 161

Balancing Mechanism Costs

- 6.70 With respect to NGC's forecast of Balancing Mechanism costs, Ofgem believes that there are four main areas in which NGC's forecast of Balancing Mechanism costs is overly pessimistic.
- 6.71 First, as noted above, Ofgem believes that the volume of regulating reserve that NGC is proposing to procure under NETA is too high for the period after 31 March 2001. Since regulating reserve will be purchased via the Balancing Mechanism, lowering its assumed volume reduces Balancing Mechanism costs. Given the way in which NGC's forecasts of Balancing Mechanism costs have been constructed, it is difficult at this stage to make an accurate adjustment for this effect. Nevertheless, NGC has told Ofgem that broadly speaking a 5% reduction in the volume of reserve and response held would lead to a £0.02 million/day (£7.5 million per annum) reduction in its forecast of Balancing Mechanism costs, whilst a 10% reduction in the volume of reserve and response held would lead to a £0.04 million/day reduction (£15 million per annum).
- 6.72 In the period to 31 March 2001, we have suggested that the total volume of response and reserve held should not be reduced from the level suggested by NGC. Hence, no adjustment to forecast Balancing Mechanism costs is required. For the period thereafter, we have suggested that the volume of response and reserve held could fall back to current levels. Accordingly, we propose reducing NGC's target Balancing Mechanism cost by a maximum of £0.12 million /day.
- 6.73 Second, it is not clear that the probabilities NGC has assigned to its Balancing Mechanism price scenarios are consistent. For example, it is not clear that the differences between Scenario 2 and Scenario 3 are so great that the probabilities assigned to them should be different. In addition, it is not clear to Ofgem that prices in the Balancing Mechanism are more likely to be very high than very low (scenario 4 versus scenario 1). We asked NGC to examine the impact of two sensitivities to its Balancing Mechanism cost modelling based on changes to the probabilities assigned in the four price scenarios. NGC's estimates of the results of these sensitivities are shown in Table 6.11.

Table 6.11: Estimated Impact of Sensitivities on Probabilities assigned to NGC Price Scenarios⁷⁵

	Probability of Scenario				BM Costs	
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Mean (£m)	Std (£m)
NGC Assumptions	5%	45%	40%	10%	1.23	0.71
Sensitivity 1	10%	40%	40%	10%	1.20	0.73
Sensitivity 2	5%	45%	45%	5%	1.16	0.61

- 6.74 The sensitivity analysis shows that relatively small changes in the probabilities assigned to NGC's price scenarios can have a significant impact on NGC's forecasts of Balancing Mechanism costs. Whilst we recognise that other sensitivities could be constructed under which forecast costs could be higher or lower, we believe that a symmetric set of probabilities (sensitivity 2) is at least as likely as NGC's assumptions and therefore have included this range of costs in our proposals.
- 6.75 Third, NGC has assumed an unplanned outage rate of 8%, which increases Balancing Mechanism costs by £0.11 million/day. NGC's key point is that on any given day, some plant will be unavailable and this we accept. However, we are unconvinced that the effect of this will be to increase the bid-offer slope i.e. the supply curve in the Balancing Mechanism by as much as NGC believes. In addition, we question the use of a single unplanned outage rate since we would expect this to vary significantly between plant types.
- 6.76 We are also concerned that there may be some element of double-counting in the separate allowance for post Gate Closure failures. More generally, we do not consider that NGC has taken sufficient account of the stronger incentives under NETA on participants to minimise unplanned outages and commercial decisions taken not to generate. Taking these factors together, we consider that it is likely that NGC has significantly over-estimated the impact of unplanned

⁷⁵ NGC has told Ofgem that it has estimated the impact of these sensitivities by using sampling and analytical techniques to generate an estimate of the mean and standard deviation for the distribution associated with the price sensitivities.

outages and suggest that an allowance of between £0.06 million/day and £0.09 million/day for unplanned outages might be more appropriate.

- 6.77 Lastly, Ofgem is also concerned by NGC's decision to take the mean of its distribution as its proposed target value. Ofgem has previously sought to establish the use of the median of NGC's forecast when setting the incentive scheme targets.⁷⁶ This is because when the underlying cost distribution is skewed, the use of the mean of a distribution, coupled with symmetric sharing factors, distorts the balance between risks and rewards and increases the expected returns under an incentive scheme. The difference between the mean and median of NGC's forecast of incentivised balancing costs is some £0.06 million/day (£22 million/annum).

Transmission Losses

- 6.78 Ofgem believes that NGC's assumptions on transmission losses require amendment. As discussed above, NGC has used a daily target based on the use of winter transmission losses. On an annual basis, this equates to target losses of 5.9 TWh compared to the mid-point of the current target range of 5.2 TWh and we do not believe this is appropriate.
- 6.79 In addition, NGC has used a reference price for transmission losses of £25/MWh. Time-weighted Pool Purchase Price (PPP) for 1999/00 was £22.9/MWh and recent EFA prices suggest a market expectation that prices overall will be lower this year. Given this recent history, we believe a reference price in the range of £20/MWh to £23/MWh could be more appropriate. Ofgem also believes that further consideration should be given to the use of a reference price that better reflects actual energy prices across the period under consideration. The use of a reference price set ex-ante could result in perverse incentives on NGC when it is looking at decisions that affect incentivised costs across several categories.

⁷⁶ 'Transmission Services Incentives Scheme, Proposals', OFFER, February 1998 and 'NGC Incentive Schemes from April 2000, Transmission Services Uplift and Reactive Power Uplift Schemes, A Decision Document', Ofgem, February 2000.

Summary of Ofgem's Initial View

6.80 Given the views expressed above, we have developed a range for the incentive scheme target based on an allowance for each element of the incentivised costs under NETA, as shown in Tables 6.12 and 6.13. NGC presented Ofgem with its information on the profiling of response and reserve volumes over the duration of the scheme shortly before the publication of this document. Thus, the implications of this for NGC's forecast of incentivised costs and Ofgem's initial views have not been explored at this stage. In developing our final proposals, we will make appropriate adjustments in this and other areas.

Table 6.12: NGC's Proposals and Ofgem's Initial View (£m/day)

Cost Category	NGC's Proposal	Ofgem's Initial View	
		Go Live to 31 March 2001	1 April 2001 to 31 March 2002
Balancing Mechanism cost	0.69	0.51 – 0.60	0.39 – 0.62
Balancing services contract cost (inc. reactive power)	0.47	0.41 – 0.47	0.39 – 0.44
Transmission Losses	0.4	0.29 – 0.33	0.29 – 0.33
Total Daily Incentivised Costs	1.56	1.20 – 1.41	1.06 – 1.39

Table 6.13: NGC's Incentive Scheme Target Proposal and Ofgem's Initial View (£m)

Cost Category	NGC's Proposal			Ofgem's Initial View		
	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Total Go Live to 31 March 2002	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Total Go Live to 31 March 2002
Balancing Mechanism cost	90	252	342	66 – 78	141 – 227	206 – 306
Balancing services contract cost (inc. reactive power)	61	172	233	54 – 61	143 – 161	197 – 223
Transmission Losses	52	146	198	37 – 43	105 – 120	142 – 163
Total Incentivised Costs for Period	203	569	774	156 - 183	388 - 509	545 – 692

6.81 Across the whole of the incentive scheme, Ofgem suggest that the incentive scheme target (including losses) could be lower than NGC's proposal by between 11% and 30% from around £774 million to between £545 million and £692 million (corresponding to a 10-23% reduction for the period to 31 March 2001 and a 11-32% reduction thereafter).

6.82 Table 6.14 compares the historic costs of system operation with NGC's forecast of balancing costs and Ofgem's initial views.

Table 6.14: Summary of Forecast Incentivised Costs and Ofgem's Initial View – Go Live to 31 March 2002 (£m)

	Range of Outturn Costs 1996/97 to 1999/00⁷⁷	1999/00 Costs⁷⁸	NGC Mean Forecast	Ofgem's Initial Proposals
Balancing Mechanism costs			342	206 – 306
Balancing services contract cost (inc. reactive power)			233	197 – 223
TSU	233 to 361	233		
EU	-10 to 84	-10		
Reactive Power	59 to 74	59		
Transmission Losses	178 to 198	178	198	142 – 163
Total Incentivised Costs for Period	460 to 698	460	774	545 – 692
Unscheduled Availability (USAV)	109 to 376	327 (122 ⁷⁹)		
Total Costs (with USAV)	683 to 1074	787 (582)	774	545 – 692

6.83 Looking across the period shown in Table 6.14, NGC's forecast of £774 million for incentivised balancing services costs is substantially higher than outturn incentivised costs over the last four years (£460 million to £698 million). Taking into account USAV payments to generators, NGC's forecast is higher than the low end of the range of outturn costs over the last four years but lower than outturn costs in 1999/00 (£787 million). However, given the substantial problems experienced with the capacity payments mechanism in 1999/00, outturn costs for 1999/00 may not represent a useful benchmark. USAV payments for the previous two years were in the order of £122 million. Using

⁷⁷ To obtain a like for like comparison with forecast costs under NETA, 1999/00 outturn costs have been pro rated to obtain equivalent costs for 495 days reflecting the expected number of days between Go Live and 31 March 2002.

⁷⁸ To obtain a like for like comparison with forecast costs under NETA, 1999/00 outturn costs have been pro rated to obtain equivalent costs for 495 days reflecting the expected number of days between Go Live and 31 March 2002.

⁷⁹ Figure in bracket is USAV based on average over the previous two years.

this figure as a benchmark for USAV payments, total incentivised costs plus USAV would have in 1999/00 been in the region of £582 million.

Incentive Scheme Sharing Factors

- 6.84 In the course of discussions between Ofgem and NGC on the revised Transmission Services Uplift and Reactive Power Uplift incentive schemes to apply from 1 April 2000, Ofgem and NGC agreed that symmetric sharing factors of 50% should be applied in order to determine incentive scheme payments. Thus, NGC and customers would share equally the costs or benefits, of better or worse than expected performance.

April Consultation

- 6.85 Ofgem argued in the April Consultation that there is some uncertainty in terms of both system and energy balancing costs under NETA and also in moving to a bundled incentive scheme. Thus, Ofgem suggested there might be merit in reducing the sharing factors in the initial SO incentive scheme. An alternative would be to leave sharing factors at 50% but to reduce the cap and collar.

NGC's View

- 6.86 NGC stressed that there is considerable uncertainty with regard to Balancing Mechanism costs under NETA, the principle source of this uncertainty being the price of bids and offers that participants will submit rather than the actions taken by NGC. Thus, NGC agreed that the sharing factors should be lower than the current 50%. It believed that the sharing factors could be increased back to current levels for an enduring scheme and as the drivers of balancing costs become better understood.
- 6.87 Since the April Consultation, NGC has proposed that the initial SO incentive scheme under NETA should incorporate sharing factors of 12.5% when outturn costs are below the incentive scheme target and 7.5% when outturn costs are

above the incentive scheme target.⁸⁰ NGC argued that given the risks of costs being higher than its central forecast are greater than costs being lower, such asymmetric sharing factors are appropriate.

Other Respondents' Views

- 6.88 Fifteen respondents to the April Consultation commented on this issue. Of these, thirteen agreed with Ofgem's proposal that the sharing factors should be symmetric, whilst two respondents were in favour of asymmetric sharing factors. Two respondents suggested a sharing factor of 50% was appropriate, whilst five respondents suggested that a lower sharing factor would be more appropriate for the initial scheme.
- 6.89 One respondent believed that the precise level of sharing factors (and caps and collars) should follow from a detailed analysis of the likely costs that NGC can be expected to incur and NGC's ability to influence these costs, and so these parameters should not be pre-determined via a consultation but should be part of the negotiation between Ofgem and NGC.
- 6.90 One respondent commented that asymmetric sharing factors would provide a greater incentive to NGC to reduce costs.

Ofgem's Initial Proposal

- 6.91 Ofgem remains committed to the principle of symmetric sharing factors and continues to believe that they reflect an appropriate balance between the interests of customers and NGC. Thus, we propose that for the initial SO incentive scheme under NETA, the incentive scheme sharing factors should remain symmetric.

⁸⁰ NGC argued that given a cap/collar of £26 million, it believed sharing factors needed to be set that incentivised it across a 90% range of likely outturn costs. Given this NGC forecast an upside sharing factor of 14.5% and a downside sharing factor of 8.6%. The asymmetric sharing factors reflect NGC's asymmetric forecast of costs i.e. it believes that there is a higher probability of costs being higher than its mean forecast than costs being lower. NGC argues that if symmetric sharing factors are used then there will be a much greater likelihood of hitting the collar on losses than hitting the cap on profits. This, it argued, can be overcome by setting very low sharing factors (below 8.6%). However, in order to sharpen its incentives and reflect the inherent asymmetry in costs, NGC proposed to establish sharing factors of 12.5% (upside) and 7.5% (downside).

- 6.92 Further consideration needs to be given to the precise level of the sharing factors. Ofgem suggests that for the initial SO incentive scheme under NETA, it might be appropriate to reduce the exposure faced by NGC and proposes that a sharing factor of between 10% and 30% should be considered. This would be broadly consistent with the sharing factors under the first incentive scheme on NGC (the Uplift Management Incentive Scheme or UMIS) introduced in 1994/95.⁸¹ It is for further consideration whether different sharing factors should be applied for the period up to 31 March 2001 and the period thereafter (1 April 2001 to 31 March 2002). For example, a sharing factor towards the lower end of the range presented above could apply for the initial period and a sharing factor towards the high end of the range above for the second period.
- 6.93 Over time, Ofgem expects to be able to increase the sharing factor of the incentive schemes under NETA. For example, the enduring SO incentive scheme under NETA might have a higher sharing factor.

Incentive Scheme Cap and Collar

- 6.94 The current TSU and RPU incentive schemes cap the payments that can be made to NGC and collar the payments made by NGC. Both the cap and collar are currently set at approximately £23 million per annum. Given both the uncertainties embodied within any incentive scheme target and the need for an incentive scheme to reflect a balance between risk and reward, Ofgem believes that the use of a cap and collar continues to be appropriate.

April Consultation

- 6.95 Ofgem's view was that the simplest arrangement would be a cap and collar that could be linked to the incentive scheme target. For example, the cap and collar could be set as percentages (for example, 10%) of the total cost target.
- 6.96 Ofgem also noted that consideration of the appropriate value for the cap and collar should be linked to the treatment of Income Adjusting Events (discussed in Chapter 5). In general, Ofgem believed that it would be sensible to limit NGC's exposure through a suitable combination of sharing factors, caps and collars, and possible provisions for Income Adjusting Events.

⁸¹ Under UMIS, the upside sharing factor was set to 30% whilst the downside sharing factor was set to 20%.

NGC's View

- 6.97 NGC explained that translating the current caps and collars to a bundled scheme would yield a value of +/-£26 million, or £70k a day. It believed that a cap and collar at this level might be appropriate for an enduring scheme, but for the initial scheme this should be reduced. It explained that a reduction would reflect the uncertainty in setting an ex-ante target and the likely volatility of Balancing Mechanism prices during the initial period of NETA. It stated that this could be increased for a subsequent enduring scheme.
- 6.98 Nonetheless, NGC has since indicated to Ofgem that it would be willing to accept a cap/collar of £26 million for the initial SO incentive scheme.

Other Respondents' Views

- 6.99 Fifteen other respondents to the April Consultation commented on this issue. Thirteen respondents agreed that payments to or by NGC should continue to be subject to a cap and collar, whilst one respondent disagreed. Of the respondents in favour of a cap and collar, two supported absolute values for the cap/collar (values of £20 million, £10 million and £5 million were suggested by some respondents), whilst two suggested that a percentage cap/collar would be more appropriate. Three respondents believed that the cap and collar for the initial scheme should be lower than at present.

Ofgem's Initial Proposal

- 6.100 Ofgem continues to believe that a cap on payments to NGC and collar on payments by NGC under the initial SO incentive scheme is appropriate. Ofgem also continues to believe that symmetric sharing factors and symmetric caps and collars are appropriate.
- 6.101 Under the current arrangements, the sum of the maximum gain or loss attainable by NGC across all its incentive schemes is approximately £26 million in a given financial year. A cap/collar based on 10% of the incentive scheme target for the initial SO incentive scheme would yield a cap/collar of around £40 million. Having carefully considered the views of all respondents to the April Consultation, Ofgem suggests that for the initial SO incentive scheme under NETA, a cap/collar in the range £25 million/year to £50 million/year would be

appropriate given that we have proposed a low sharing factor and proposed to retain provisions for Income Adjusting Events for the initial SO incentive scheme under NETA. It is for further consideration whether different caps and collars should be applied for the period up to 31 March 2001 and the period from 1 April 2001 to 31 March 2002. For example, a cap/collar towards the lower end of the range presented above could apply for the initial period and a cap/collar towards the high end of the range above for the second period (appropriately adjusted for the different lengths of the two periods).

6.102 Whilst Ofgem continues to believe that symmetric caps/collars are appropriate, we understand NGC's concerns with regard to the uncertainties and risks it faces under NETA. Ofgem believes that the low sharing factors we have proposed and the retention of Income Adjusting Events for this incentive scheme provide NGC with adequate protection at the start of NETA. Nevertheless, we are continuing to consider whether an asymmetric cap and collar (with a larger cap than collar) might be appropriate for the initial SO incentive scheme given that Ofgem has proposed symmetric sharing factors.

6.103 Over time, Ofgem expects to be able to increase the cap/collar of the incentive schemes under NETA. For example, the enduring SO incentive scheme under NETA might have a cap/collar of between £40 million and £100 million.

Reference Prices for the Net Imbalance Volume

6.104 As discussed above, Ofgem has concluded that NGC should be incentivised on all energy and system balancing costs subject to reducing its exposure to the Net Imbalance Volume in the Balancing Mechanism by use of a reference price. Ofgem noted in the April Consultation that the reference price would have to lie between the SBP and SSP to provide NGC with the correct incentives. We also believe it is important that the reference price should be transparent and not be open to manipulation by any party, including NGC.

April Consultation

6.105 In the April Consultation Ofgem suggested three possible options for how the reference price could be set:

- ◆ a dynamic reference price that changed daily or even half-hourly taken from a liquid and transparent power exchange;
- ◆ a pre-determined fixed price or matrix of prices; or
- ◆ a reference price linked directly to energy imbalance prices. For example, the reference price could represent an average of the two energy imbalance prices or it could be based on proportion of the SBP and the SSP.

6.106 Ofgem argued that a dynamic reference price emerging from forwards markets is likely to reflect best the price of energy traded by market participants. However, Ofgem recognised that at least initially a suitable reference price from a power exchange or other market may not have emerged at the start of NETA.

Furthermore, whilst prices in the forwards markets and bids and offers in the Balancing Mechanism will have some common drivers, the drivers of prices in each market will not be identical. If the reference price were to fall outside the range represented by the SBP and the SSP, the effectiveness of NGC's incentives would be significantly reduced. One possibility might be to bound the reference price to ensure that it remains in the right range.

6.107 Similar considerations also apply to the pre-determined reference price approach. In addition, there is likely to be considerable debate as to the appropriate value(s) for a pre-determined reference price. One possibility would be the average EFA price for winter peak/baseload contracts at the start of NETA.

6.108 A reference price linked to outturn energy imbalance prices could be set to ensure that the reference price always lies between SBP and SSP. However, this option could provide NGC with a perverse incentive. For example we will need to explore further whether, by taking certain actions in the Balancing Mechanism, NGC could influence energy imbalance prices to maintain a differential between SBP and SSP in order to obtain a pay-off under its incentive scheme.

NGC's View

6.109 As discussed above, NGC has proposed that the reference price should be set to the SBP when the system is short and to the SSP when the system is long.

Other Respondents' Views

- 6.110 Twenty one respondents to the April Consultation commented on this issue. One respondent believed that a reference price would be unnecessary if the incentive schemes were unbundled.
- 6.111 Seven respondents expressed a preference for a dynamic or 'floating' reference price. One of these respondents suggested that a fixed price be used initially before moving towards a price based on the forwards markets, another simply highlighted that prices in forwards markets may be extremely volatile during the early days of NETA.
- 6.112 Many respondents emphasised the need for the reference price to lie between SBP and SSP, to ensure NGC had the correct incentive. One respondent commented that the reference price must at least be varied according to the demand level or else, for much of the year, it will not fall between SBP and SSP leading to distorted market incentives and a mis-valuation of the cost of imbalances.
- 6.113 Two respondents thought the reference price should be linked to energy imbalance prices as these will be transparent. One respondent suggested that if the reference price was set to the average of SBP and SSP, this would at least have the merit of simplicity and transparency.

Ofgem's Views

- 6.114 Having carefully considered respondents' views to the April Consultation, and following further consideration, Ofgem believes that there are two main options for setting the reference price to reduce NGC's exposure to the Net Imbalance Volume which need further exploration.
- 6.115 First, it would be possible, as NGC suggests to set the reference price to be equal or linked to the SBP or the SSP depending on the direction of the net imbalance in any given half hour. However, Ofgem is not convinced that this option would appropriately incentivise NGC, as far as possible, to minimise the Net Imbalance Volume and/or accept the most economic bids and offers.

- 6.116 Second, it would be possible, to combine a floating price approach with a cap and collar set to SBP and SSP respectively. Thus, the incentive properties of using a reference that reflects energy prices in forwards markets could be maintained whilst providing the assurance that the SBP/SSP cap/collar would ensure that the reference price would always be within the range given by the SBP and SSP. One possibility would be to use a floating price based on EFA prices for month-ahead contracts.
- 6.117 Ofgem believes further consideration should be given to this issue, but has an initial preference for the second option outlined above. It should further be noted that the allowable revenues for NGC will need to be considered in the light of the price that is ultimately chosen.⁸²

Threshold Price Adjustment

NGC's View

- 6.118 In its most recent submission, NGC has suggested that the possible existence of very highly-priced sleeper bids and offers could result in the costs of balancing the system moving outside the incentivised range as a result of a very small number of acceptances of such offers or bids. Accordingly, NGC has proposed that the costs of all accepted offers with prices higher than £500/MWh should be excluded from the incentivised cost calculation.

Ofgem's View

- 6.119 Whilst Ofgem accepts that NGC's hypothesis is possible, we do not agree with NGC's solution since we consider that it would only encourage the placing of sleeper offers. To the extent that any such bids or offers are accepted, we believe that NGC should call an Income Adjusting Event if, as a result of accepting such a sleeper bid or offer, its incentivised costs move outside the incentivised range. It will then be for the Director General to decide whether an event called by NGC actually constitutes an income adjusting event. This will maintain the balance between risk and reward that the incentive scheme should aim to achieve.

⁸² For example, a reference price of £20/MWh across the period as opposed to a reference price based on SBP and SSP would increase NGC's forecast of incentivised BM costs from £0.69 million/day to £0.94 million/day.

- 6.120 The draft modifications to NGC's Transmission Licence presented in Appendix 6 include provisions for the recovery of these costs.

The Treatment of SO Internal Costs

- 6.121 The treatment of SO internal costs has been extensively discussed in Chapter 5. With regard to the parameters of the initial incentive scheme, only two issues can be resolved at this stage. First the treatment of the Ancillary Services Overheads and TS incremental costs that are not recovered under the current scheme (likely to be around £2.2 million based on NETA implementation in mid November). Second, the treatment of NGC's internal NETA related costs incurred before 1 April 2001 (around £3.9 million).

Ofgem's Views

- 6.122 With respect to the Ancillary Business Overheads and incremental TS costs allowed under the current TSU incentive scheme, Ofgem continues to believe that these should be recovered pro-rata under the initial incentive scheme under NETA. For 2000/01, NGC was given an allowance under the TSU incentive scheme of £5.6 million for Ancillary Service Business Overheads and £0.5 million for Incremental Transmission Services Costs. Based on a "Go Live" date for NETA sometime around the middle of November 2000, NGC would be allowed to recover £2.2 million of these costs under the initial SO incentive scheme.
- 6.123 Ofgem proposes that NGC should be allowed to recover £3.9 million of its NETA related costs during the period from the introduction of NETA to 31 March 2001. However, this in no way commits Ofgem to agreement on the overall level of NETA related costs NGC should be allowed to recover. It should be noted that the draft licence conditions (included in Appendix 6) related to SO internal costs are at an initial stage and should not be taken to imply a methodology for the incentivisation or otherwise of SO internal costs. The level of internal SO costs and their incentivisation will be considered as part of the separate SO Price Review.

Summary and Views Invited

6.124 In summary, Ofgem believes that NGC has been unduly pessimistic in its forecast of balancing costs under NETA and thus its proposed target for the initial SO incentive scheme under NETA. Based on the factors identified above, we have developed some initial estimates of the savings that should be possible to achieve against the forecast of costs provided by NGC. Ofgem's initial proposals are summarised in table 6.15 below.

Table 6.15: Ofgem's Initial Proposal (£m)

Cost Category	NGC's Proposal			Ofgem's Initial View		
	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Total Go Live to 31 March 2002	Go Live to 31 March 2001	1 April 2001 to 31 March 2002	Total Go Live to 31 March 2002
Balancing Mechanism cost	90	252	342	66 – 78	141 – 227	206 – 306
Balancing services contract cost (inc. reactive power)	61	172	233	54 – 61	143 – 161	197 – 223
Transmission Losses	52	146	198	37 – 43	105 – 120	142 – 163
Total Incentivised Costs for Period	203	569	774	156 - 183	388 - 509	545 – 692

6.125 Further consideration needs to be given to the precise level of the sharing factors for the initial SO incentive scheme under NETA. Ofgem believes that it might be appropriate to significantly reduce the exposure faced by NGC and proposes that a sharing factor of between 10% and 30% should be considered. Ofgem continues to believe that a cap on payments to NGC and a collar on payments by NGC under the initial SO incentive scheme is appropriate. Ofgem also continues to believe that symmetric sharing factors and symmetric caps and collars are appropriate. Ofgem believes that a cap/collar between £25 million and £50 million (on an annualised basis) for incentive scheme payments should be considered for the initial SO incentive scheme under NETA.

- 6.126 Ofgem is not convinced that the reference price used to reduce NGC's exposure to the Net Imbalance Volume should be linked only to energy imbalance prices. Ofgem believes further consideration should be given to this issue, but has an initial preference for a reference price that combines a floating price approach with a cap and collar set to SBP and SSP respectively.
- 6.127 In addition, Ofgem does not believe that the costs of all accepted offers with prices higher than £500/MWh (so called sleeper bids/offers) should be excluded from the incentivised cost calculation.
- 6.128 Finally, Ofgem proposes that NGC should be allowed to recover £3.9 million of its NETA related costs and £2.2 million⁸³ in Ancillary Services Overheads and TS incremental costs that are not recovered under the current scheme during the period from the introduction of NETA to 31 March 2001. However, this in no way commits Ofgem to agreement on the overall level of NETA related costs NGC should be allowed to recover.
- 6.129 Views are invited on all the issues covered in this chapter. In particular views are invited on:
- ◆ the drivers affecting the volume and price of balancing services under NETA;
 - ◆ the appropriate volume allowance for Balancing Services Contract costs within the incentive scheme target;
 - ◆ the appropriate allowance for Balancing Mechanism costs within the incentive scheme target;
 - ◆ the appropriate allowance for transmission losses within the incentive scheme target;
 - ◆ the appropriate reference price to be used to price transmission losses including whether it should be fixed or floating;
 - ◆ the appropriate sharing factors for the initial SO incentive scheme;

⁸³ Assuming a Go Live date around the middle of November 2000.

- ◆ the appropriate cap/collar for the initial SO incentive scheme;
- ◆ the appropriate method for determining a reference price to be used to reduce NGC's exposure to the Net Imbalance Volume;
- ◆ Ofgem's proposal not to allow a threshold price adjustment; and
- ◆ the recovery of NGC's internal SO costs.

7. The Treatment of Transmission Losses under NETA

7.1 Ofgem's April Consultation addressed the issue of transitional arrangements for the treatment of transmission losses to be in place for the implementation of NETA. This chapter presents Ofgem's conclusions on these transitional arrangements.

Background

7.2 Transmission losses in England and Wales are currently charged on a uniform basis across all electricity purchased in the Pool. The metered demand of all suppliers, in each settlement period, is scaled up such that the total demand through the Pool is equal to total metered generation. Thus, the cost of actual losses is currently recovered only from suppliers.

7.3 In accordance with Schedule 12 of the P&SA, set up at Vesting, the Pool's Transmission Steering Group, in March 1996, considered the issue of locational charging for losses and suggested a more cost reflective zonal approach to charging for losses on both generators and suppliers. Subsequent to Pool member approval and the Director General upholding the Pool's resolution in an appeal for determination, the Pool Executive Committee set out in July 1996 a timetable to implement a differential Transmission Loss Factor (TLF) scheme in November 1997. A challenge by Teesside Power and Humber Power led to a judicial review, which has so far prevented the proposals from being implemented.

December Consultation

7.4 The December Consultation presented several specific objectives for the treatment and charging of transmission losses, as well as raising a number of specific issues to be considered in the design and application of any transmission loss charging regime:

- ◆ whether charges for transmission losses should be defined on a zonal or nodal basis;

- ◆ whether predetermined or actual flows should be used to calculate loss factors;
 - ◆ whether marginal or average losses should be used to determine charges; and
 - ◆ whether responsibility for purchasing losses should be with participants or NGC, as SO.
- 7.5 Ofgem proposed that losses should be charged by scaling the metered volumes of both generators and suppliers, prior to settlement, on the basis of pre-determined (ex-ante) locational marginal loss factors, and that the surplus revenues accruing from the use of marginal loss factors should be retained by the SO to offset against other transmission charges.
- 7.6 NGC was generally supportive of the objective of establishing an efficient regime for the treatment and charging of transmission losses, though it raised a number of points associated with the interaction between the treatment and charging of transmission losses and any new transmission access and pricing arrangements. In subsequent discussions, NGC has proposed that at the inception of NETA, NGC should be responsible for the purchase of actual average losses, with costs incurred being recovered through a smeared charge across all participants.
- 7.7 Thirty respondents to the December Consultation commented on issues related to the treatment of transmission losses under NETA. Of these, the majority supported the need for reform to the treatment of transmission losses, though reservations were expressed concerning the introduction of marginal losses at the same time as NETA.

April Consultation

- 7.8 In the April Consultation, Ofgem recognised respondents' concerns regarding attempts to implement a full zonal marginal loss factor scheme in time for the start of NETA. For example, the calculation of ex-ante loss factors to be used in a losses scheme for the introduction of NETA would have had to be based on data for electricity flows prior to the introduction of NETA. It is uncertain at this

stage whether pre-NETA patterns of generation and demand will be a good indication of energy flows, and hence of transmission losses under NETA. Given these uncertainties, Ofgem agreed that it would not be appropriate, at the outset of NETA, to expose participants to the sharper signals provided by locational and marginal loss factors.

7.9 Instead, the April Consultation proposed interim arrangements for the treatment of transmission losses. The key features of the proposed interim losses regime were:

- ◆ adjustments for transmission losses should be based on national, actual (i.e. average) losses and should be uniformly recovered on the basis of metered volumes;
- ◆ both generation and demand should be exposed to the costs and benefits of transmission losses; and
- ◆ participants would be responsible for purchasing losses in the sense that their imbalance volumes would be adjusted for losses.

7.10 Ofgem believed that the use of actual losses rather than an ex-ante forecast of marginal loss factors would help, in the absence of information on the pattern of flows under NETA, to avoid the uncertainties and risks involved in using pre-NETA data to determine loss factors to be applied to generation and demand under NETA.

7.11 In order to expose participants to the costs and benefits of transmission losses, transmission loss volumes (adjustments to metered volumes) determined for each settlement period should be allocated across all BM Units. Ofgem proposed that for the start of NETA, 40% of the total volume of losses should be allocated to generators while 60% should be allocated to the demand side. The rationale for this 40:60 split (as opposed to a 50:50 split), was that broadly speaking, the Defined Meter Point for generation (under the Metering Codes of Practice) is the high voltage side of the generator transformer, whereas that for demand is the low voltage side of the supergrid transformer. Therefore, the loss volumes calculated do not take into account the supergrid transformer losses

already incurred by generators, but do include the supergrid transformer losses on the demand side.

- 7.12 The adjustment of metered volumes in the imbalance settlement process means that participants would ultimately be responsible for purchasing losses under the initial NETA arrangements. Participants could choose to provide for losses themselves by adjusting their contractual position accordingly. Alternatively, participants could choose to buy their losses at the appropriate imbalance price. Some uncertainty would be faced by participants through the adjustment of metered volumes in the settlement process on the basis of actual ex-post losses, as it may be difficult to predict accurately, and thereby contract for, the level of losses that will actually be applied, but this uncertainty is less than that faced by demand side participants under the current treatment of losses (due to the wider charging base over which losses will be spread).
- 7.13 The proposals set out in the April Consultation were designed to minimise the effect on participants at the start of NETA. The only significant difference from the current losses charging arrangements is that generation will be allocated a portion of the losses and all participants will have a range of options for purchasing their loss obligations.

NGC's View

- 7.14 In its response to the April Consultation, NGC supported Ofgem's objective of establishing an efficient regime for the treatment of and charging for transmission losses. However, NGC did express reservations over the scheme proposed by Ofgem as, in its view, the interim losses regime proposed for NETA is inconsistent with moving towards the introduction of a more cost reflective treatment of transmission losses in the future. For example, NGC argued that under Ofgem's proposal, participants will need to adjust their contract volumes to account for the ex-post adjustment of their metered volumes. Given the uncertainty over the volumes of losses under NETA, NGC argued that the process of individual participants contracting for losses would be ambiguous and that this would add to the risks faced by individual parties and therefore result in higher costs. In addition, NGC also claimed that there is a risk that the SO, acting in accordance with the incentive scheme, could make decisions that are

not entirely consistent with economic despatch if participants have already internalised the effects of loss volume adjustments in their prices.

- 7.15 Although no specific comments were made with respect to the three main issues in the April Consultation on which views were invited, NGC continued to put forward its alternative proposal that transmission losses should be treated as a Balancing Service. Under this proposal, all losses would be purchased by NGC, with a separate charge levied across all participants to recover the cost of purchasing losses. The regime would fall under the incentive scheme, and in NGC's view, this would avoid any ambiguous effects of scaling metered volumes.

Other Respondents' Views

- 7.16 Twenty six respondents to the April Consultation commented on issues relating to the treatment of transmission losses under NETA. Most respondents were supportive of Ofgem's proposals for a transitional losses regime for the start of NETA.
- 7.17 Strong support existed for using ex-post actual losses to adjust participants' metered volumes, as opposed to the use of ex-ante losses. Only three participants disagreed with the use of ex-post losses. Of these three respondents, one argued that the economics of the system would not be significantly affected by NETA and thus the determination of ex-ante loss factors should not be difficult. Another respondent argued that the ex-post method exposes participants to an imbalance volume over which they have less control and less ability to forecast.
- 7.18 Twenty one respondents to the April Consultation commented on the issue of sharing total losses between generation and demand on a 40:60 basis. Seven respondents were strongly in favour of the proposed 40:60 split. A further eight respondents agreed with the principle of sharing losses between generation and demand but expressed concern regarding the specific split of 40:60 proposed. Four of these eight respondents argued that a 50:50 sharing factor was more appropriate. Six further (five generators and one vertically integrated company) disagreed with the principle of sharing costs between generators and suppliers,

the key reason cited being that the proposal imposed an unnecessary increase in administrative complexity and would only serve to raise transaction costs.

- 7.19 There was widespread support for the proposal that participants themselves should be responsible for purchasing their own losses. Many respondents agreed that this proposal was consistent with the philosophy and principles underlying NETA. One participant argued that making participants responsible for purchasing losses only made economic sense if locational transmission loss factors were used.
- 7.20 Several respondents to the April Consultation argued that NGC's forecasts of losses should be made transparent to the rest of the market and that the Balancing Mechanism Reporting System (BMRS) could be used by NGC to publish its forecasts of transmission losses.

Ofgem's Conclusions

- 7.21 Ofgem has concluded that the treatment of losses outlined in the April Consultation remains the most appropriate transitional arrangement. Whilst the use of ex-post transmission loss factors in making loss adjustments may not be an appropriate long term solution, it provides a simple and convenient interim measure, which is not seen as problematic by the majority of participants.
- 7.22 Thus, the metered volumes of all participants in imbalance settlement will be adjusted at the start of NETA by national, average loss factors determined ex-post. However, following the consultation on the BSC, Ofgem has accepted that the split of transmission losses between generators and suppliers should be in the ratio 45:55 rather than 40:60. This 45:55 ratio, which is included in the draft BSC, will better reflect the impact of the different ways in which transformer losses are treated for generation and demand.
- 7.23 In terms of the enduring treatment of transmission losses, Ofgem, in the December Consultation, presented some potential options and is in the process of considering a number of alternative approaches that would be consistent with new transmission access and pricing arrangements. The way forward on transmission access and pricing arrangements was discussed in Chapter 1.

Conclusions

- 7.24 In summary, Ofgem proposes, with widespread support from respondents, to introduce for the start of NETA an interim regime for the allocation and pricing of transmission losses. Under the transitional regime, ex-post losses will be used to scale the metered volume of generation and demand participants on a 45:55 basis to account for actual transmission losses. This will incentivise participants to adapt their contractual positions to reflect their expected allocation of losses.

Appendix 1 Current Definitions of Ancillary Services

NGC is required, under Condition 6 of its Transmission Licence, to procure sufficient “Ancillary Services” as is appropriate to enable it to discharge its obligations under the Electricity Act 1989 and Transmission Licence. This requirement is couched in terms of the provision of services specified in the Grid Code and the MCUSA. The Ancillary Services Business, currently a separate business (under the Transmission Licence) within NGC, is currently responsible for procuring these Ancillary Services and there is an economic purchasing obligation on NGC in contracting for Ancillary Services.

There are two categories of Ancillary Services: System Services and Commercial Services. System Services are services that NGC requires to operate the system safely and reliably. Part 1 System Services are services that all licensed generators must be capable of providing in accordance with the terms of the Grid Code and the MCUSA.⁸⁴ They are restricted to specified capabilities for frequency response and reactive power. Should a generator fail to provide them, NGC has the right to refuse to connect the generator to the transmission system. Part 2 System Services (such as black start services) are not required from every generator and their provision is agreed on a site by site basis. However, if NGC requests the provision of a Part 2 System Service, a participant must provide terms (technical and commercial) for its supply. Commercial Services are services that are essential but not mandatory and generators can refuse to provide them. NGC makes payments for both System and Commercial Services under a variety of arrangements.

Four main Ancillary Services are defined: reactive power; reserve; frequency response and black start capability. In addition, NGC has, on occasion, signed Ancillary Services contracts to assist in the alleviation of constraints and it has contracts for emergency assistance from the French and Scottish transmission systems. It is Ofgem’s view that reserve is primarily associated with achieving an energy balance whilst reactive power and black start are used for system balancing. Frequency response is generally a System Service but to the extent that, at longer timescales, it merges with reserve it can also be considered partly as an energy balancing service.

⁸⁴Unlicensed generators may also provide Ancillary Services but are not obliged to under the terms of the Grid Code.

Reactive power flows are required to control the voltage of the system. NGC uses the reactive power capabilities of generators and some consumers to provide real-time control of the voltage on a locational basis. In addition, NGC can use its own transmission assets to control flows. The way the transmission network itself is configured and operated also affects reactive power flows and NGC owns and utilises specialist equipment, such as Static VAR Compensators, the capital costs of which are remunerated under NGC's Transmission Price Control.

A number of different types of reserve are defined. Scheduled reserve (also known as spinning reserve) is provided by part loading generating units able to increase output rapidly. There are two elements to scheduled reserve, frequency response as detailed below, and regulating reserve available over a 5-30 minute timescale. Standing reserve is provided under contract by generating plant and load managers able to respond in less than 20 minutes and maintain a service for at least two hours (repeatable within 20 hours). Contingency reserve is provided over longer timescales (5 to 24 hours). It is typically provided by NGC instructing plant with long notice to synchronisation times to start-up or to remain on hot standby.

Frequency response can be viewed as short term reserve that is provided automatically i.e. without explicit instruction and is used to contain and reduce or recover frequency changes before reserve can be instructed. Frequency response is divided between the continuous service provided by generating units and the occasional service provided by parties that respond to large frequency changes (e.g. using a low frequency relay) and comprises different forms of response (primary, secondary and high frequency).

Black start is the capability of a power station to start-up at least one of its generating units without an external power supply and is called on by NGC as a means of restoring supplies following a major failure on all or part of the network.

Appendix 2 Current Procurement of Ancillary Services

Currently, Ancillary Services are typically procured under bilateral contracts between NGC and individual service providers. The length of these contracts varies between one year and effectively the lifetime of the asset (for Part 1 System Services). Remuneration for the service can either be cost or value based. Initially, cost-based remuneration was considered appropriate for mandatory services. However, progress is continuing to be made towards introducing competition (particularly from the demand-side) and market-based mechanisms for procurement and value-based remuneration.

NGC currently holds two tender rounds each year to meet its reactive power requirements. Any eligible service provider⁸⁵ can submit bids to NGC to provide reactive power services. NGC makes information available, in the public domain, on these tender rounds to aid transparency. This includes details on the tender evaluation, the number and type of tenders, details on the proportion of successful bids and the aggregate payments and volumes that have been made. Since reactive power is a Part 1 System Service, there are default arrangements to provide remuneration to generators that do not participate or are unsuccessful in the auction. The default payments are geographically differentiated and the basis for remuneration is changing from a split between capability and utilisation payments to pure utilisation payments from 1 April 2000.

In the last tender round, for contracts from 1 April 1999 to 31 March 2000, 102 tenders were received from centrally despatched generating sets (67% of eligible sets) at 39 power stations owned by 11 generators. No tender offered services above the minimum obligatory services.⁸⁶ Agreements were offered to 75 sets and signed with 57 sets (11 generators) or approximately 40% of the market. During the first year of reactive power tenders (April 1998 to March 1999), approximately 27% of total reactive power payments were under contract with the remaining 73% being made under the default arrangements.

⁸⁵ Eligible service providers are defined in Master Connection Use of System Agreement (MCUSA) but include centrally despatched generators, embedded generators, non-centrally despatched providers and large demand users.

⁸⁶ The Grid Code connection conditions specify "All Generating Units must be capable of supplying rated power output (MW) at any point between the limits 0.85 power factor lagging and 0.95 power factor leading at the Generating Unit terminals. The short circuit ration of Generating Units shall be not less than 0.5."

Additional services above the mandatory conditions include Commercial Services such as synchronous compensation and extended power factor ability.

The different types of reserve are procured and remunerated in different ways. Scheduled reserve is procured and paid for through the Pool with the costs appearing in Transport Uplift. Contingency reserve is procured through bilateral contracts. The costs of contingency reserve are captured through cancelled start and hot standby payments if the cancellation occurs within the plant's notice to synchronise period. If a plant is ordered and subsequently cancelled outside its notice to synchronise time then the service is provided free. If the plant is subsequently called to provide energy (not whilst being called to provide contingency reserve) then these costs appear in Operational Outturn.

Standing reserve is provided under contract via an annual tender process conducted by NGC. In assessing an individual tender, NGC calculates the effective expected cost of the reserve offered, taking into account the split between capability and utilisation prices, and a probabilistic assessment of the expected utilisation of the reserve contract.⁸⁷ NGC will enter into a reserve contract with a participant if the expected cost of each MWh of a tender is less than the Value of Lost Load (VoLL), on the basis that VoLL is intended to represent the maximum price that customers are willing to pay to ensure security of supply. Information on the standing reserve tender, including offered and accepted volumes and successful tender prices has been made available in an NGC report available on their website.⁸⁸ The total new volume of standing reserve options for 1998/99 was 1174 MW bringing the total volume, including existing contracts, to 2120 MW. It is estimated that the standing reserve agreements entered into for the 1998/9 financial year will amount to an "Average Equivalent Cost" of around £9.8/kW per annum for approximately 4,500 service hours.

Cost based payments cover approximately half the required level of frequency response services, with the remainder being provided through commercial arrangements that provide value based remuneration. In addition, there have been discussions on the development of a frequency response market. Since the level of frequency response required is based on NGC's judgement of the maximum infeed loss that could occur, NGC can make a trade-off between constraint payments (to limit the infeed loss possible) and frequency response payments.⁸⁹ Similar tradeoffs can be made between

⁸⁷ The probabilistic assessment takes into account plant loss statistics, reserve contracts (including scheduled reserve) already accepted and demand forecast errors.

⁸⁸ NGC's web address is www.ngc.co.uk

⁸⁹ There are also strong trade-offs between constraints and other Ancillary Services including reactive power and reserve.

other Ancillary Services, notably reserve and reactive power. In addition, deloading plant for constraints can also be used to provide frequency response, reserve and reactive power.

Black start capability is procured under long term contracts that are subject to commercial negotiations between NGC and the service providers. Payments for black start facilities are based on three main components – staged payments reflecting the investment costs of installing new black start facilities, availability payments (£/hr) and utilisation payments (£/MWh).

Ancillary Service constraint contracts are also the result of bilateral negotiations.

Table A2.1 provides a breakdown of the annual average costs of Ancillary Services in England and Wales over the period 1996 to 1998.

Table A2.1 – Approximate Breakdown of Annual Ancillary Services Costs (£ million)

Service	Contract costs	Pool costs	Notes
Reactive Power	50	Small	The costs of voltage constraints are included within constraints below.
Frequency Response	35	40	
Regulating Reserve	10	70	Regulating reserve covers all categories of reserve held on synchronised plant, excluding frequency response.
Standing Reserve	5	10	The contract costs are option fees minus exercise rebates. The balance between contract and Pool costs is dominated by exercise rebates.
Constraints	< 1	35	In any year, there are very few ancillary constraint contracts.
Black Start	10	< 1	

Note: Costs are rounded to the nearest £5m. Overhead and Miscellaneous costs have been excluded from this breakdown.

Source: 'The New Electricity Trading Arrangements, Volume 2, An Ofgem decision document', October 1999.

Procurement Guidelines

Draft Version Date: 13 July 2000

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1. General Provisions

PART A: INTRODUCTION

1. Purpose of Document

This document sets out the Procurement Guidelines (“Guidelines”) which The National Grid Company plc is required to establish in accordance with Licence Condition 7B of its Transmission Licence. The purpose of these Guidelines is to set out the kinds of Balancing Services which we may be interested in purchasing, together with the mechanisms by which we envisage purchasing them.

The Guidelines are not prescriptive of every possible situation that we are likely to encounter, but rather represent a generic statement of procurement principles we expect to follow.

The remainder of this document is structured in four parts. Part B sets out the broad definitions of Balancing Services, together with the general principles we intend to follow in procuring them. Part C describes the kinds of Balancing Services we expect to procure, with Part D setting out the procurement mechanisms we expect to utilise in procuring such Balancing Services. Part E describes the information we will provide to ensure that appropriate signals are available to the marketplace.

In the event that it is necessary to modify these Guidelines in advance of issuing an updated version of this document, then this will be done by issuing a supplement to these Guidelines.

We have developed the Guidelines in consultation with the Authority/Director. The Guidelines may be modified in accordance with the processes set out in Transmission Licence Condition 7B. We will continuously monitor the validity of these Guidelines and intend, in

discussion with the Authority/Director, to periodically review the form of these Guidelines and, where appropriate, make such revisions as necessary.

The Guidelines make reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary to modify the Guidelines in order that they remain consistent with the Grid Code or Balancing and Settlement Code.

In any event, where the provisions of the Grid Code and/or the Balancing and Settlement Code are considered inconsistent with any part of these Guidelines, then the Grid Code or Balancing and Settlement Code provision will take precedence.

PART B: GENERAL PRINCIPLES

1. Balancing Services

The services we need to procure to operate the transmission system constitute Balancing Services.

The Transmission Licence defines Balancing Services as:

- “(a) Ancillary Services;
- (b) offers and bids made in the Balancing Mechanism; and
- (c) other services available to the Licensee which serve to assist the Licensee in operating the Licensee’s Transmission System in accordance with the Act or the Conditions and/or in doing so efficiently and economically.”

Ancillary Services:

These services are described in the Grid Code Connection Condition 8 and are services procured from Authorised Electricity Operators (AEOs) or persons that make Interconnector transfers. These services can be mandatory or commercial in nature. They are not procured from electricity consumers.

Balancing Mechanism offers and bids:

These are commercial services, offered by generators and suppliers, procured through arrangements set out in the Balancing and Settlement Code. They represent a willingness to increase or decrease the energy output from Balancing Mechanism Units in exchange for payment. Accepted services are used to control the national and local balance of generation and demand.

Other Services:

These are commercial services, that can be entered into with any party, which are classified neither as Ancillary Services nor as Balancing Mechanism offers and bids. This category would include any service provided by parties that are not signatories to the Balancing and Settlement Code. Other services may also include the procurement of energy for balancing purposes.

2. Procurement Principles

When procuring Balancing Services, we will apply the following principles.

- In contracting for the provision of Balancing Services we will purchase from the most economical sources available to us having regard to the quality, quantity and nature of such services at that time available for purchase.
- Without prejudice to the factors above and after having taken relevant price and technical differences into account, we shall contract for Balancing Services in a non-discriminatory manner.
- Where there is, or is likely to be, sufficient competition in the provision of a Balancing Service we will seek to procure that service via an appropriate competitive process or market mechanism. In such instances we shall provide a statement indicating the processes and terms under which contracts shall be awarded.
- If we consider that there is insufficient competition in the provision of a Balancing Service (e.g. where there is some form of local monopoly) we shall contract for such provision on a negotiated bilateral basis.

- If Balancing Services are required over a relatively long term, we shall advertise that requirement as appropriate through the communication media set out in Part D of this document.
- If a third party requires Balancing Services, and if we secure provision of such services on their behalf, the associated costs of provision will be fully recharged to the party requiring such services.

3. **Balancing Services Relationships**

Both Ancillary Services and Other Services will be procured against the principles set out in this statement. It should be recognised that the volume of services procured will be constrained by economic and technical factors, including the level and nature of services delivered through Balancing Mechanism offers and bids.

Offers and bids within the Balancing Mechanism will be accepted in economic order, taking account of system technical limitations and dynamic parameters associated with the offers and bids. Taking account of these constraints, when all available offers/bids that can be accepted have been exhausted, emergency action may need to be initiated.

Ancillary Services and Other Services can be considered collectively as services procured outside the Balancing Mechanism. We will need to procure Ancillary Services and Other Services for:

- System Security - Services may be procured outside the Balancing Mechanism if we consider that there will be insufficient offers and bids available within the Balancing Mechanism to balance the system and maintain security of supply.

- Cost - Services may be procured outside the Balancing Mechanism if we consider that it would provide an economic alternative to purchasing services through the Balancing Mechanism.
- Differentiation – Services may be procured outside the Balancing Mechanism if the required technical characteristics are not available through Balancing Mechanism offers and bids.

4. **Taking Actions Outside the Balancing Mechanism**

Our consideration of whether to undertake actions within or outside the Balancing Mechanism will be based on a forecast of the level and cost of services expected to be available within the Balancing Mechanism.

Contracts will be entered into outside the Balancing Mechanism when we anticipate a shortage of appropriate offers and bids in the Balancing Mechanism to meet system security requirements, or if we consider that such contracts will lead to a reduction in overall cost.

PART C: BALANCING SERVICES REQUIRED

1. Types of Balancing Services

We are interested in procuring the following types of Balancing Services:

Ancillary Services

- System Ancillary Services (Part 1), the mandatory services, required from all licensed generators, of:
 - Reactive Power; and
 - Frequency Response.

- System Ancillary Services (Part 2), the necessary services, required from some generators, of:
 - Black Start Capability; and
 - Fast Start Capability.

- Commercial Ancillary Services. The following services, required from some generators, of:
 - Enhanced Reactive Service;
 - Commercial Frequency Response Service;
 - Reserve Services; comprising of:
 - Fast Reserve
 - Standing Reserve
 - Warming;
 - Commercial Intertrips; and
 - Emergency Assistance.

Other Services

Other Services, other than those provided as an Ancillary Service, comprise of:

- Reactive Power
- Frequency Response
- Standing Reserve
- Demand Intertrip

Energy Related Products.

2. Description of Balancing Services

2.1 Ancillary Services

There are two broad types of Ancillary Service, as defined in the Grid Code. System Ancillary Services, which are divided into two parts: Part 1 System Ancillary Services are mandatory services required from all licensed generators; Part 2 System Ancillary Services are necessary services provided by some generators, on a site by site basis, to meet specific system requirements. Any Ancillary Service, which is not a System Ancillary Service, and which is provided by an AEO is termed a Commercial Ancillary Service.

System Ancillary Services comprise the services as set out in and described in Grid Code Connection Condition 8.1:

- Part 1 System Ancillary Services - All licensed generators are required to provide these mandatory services, which ensure the provision of a minimum technical capability to deliver voltage and frequency response services.
- Part 2 System Ancillary Services - Some generators are required to provide black start capability and/or fast start capability service. Our additional requirements for these services depend on the actual and expected provision of such services by existing providers.

We are interested in discussing arrangements with potential new providers of the Black Start Service. However, there is no requirement for any additional Fast Start Capability beyond the current provision from all existing providers.

Commercial Ancillary Services comprise the services as set out in Grid Code Connection Condition 8.2. Commercial Ancillary Services are not defined in the Grid Code as an exhaustive list of the services that we may contract for. The services we expect to procure are:

- Enhanced Reactive Service - which exceeds the minimum technical requirement set out in Grid Code Connection Condition 6.3.2. We will contract for such services as described in the relevant reactive power market arrangements (see Part D).
- Commercial Frequency Response Service - which provides for combinations of different technical characteristics (compared to mandatory frequency response services), together with alternative pricing arrangements. We contract for such services when the anticipated cost is lower than the alternative service provision.
- Reserve Services - these are instructed services required over a variety of time frames to deal with the matching of generation with demand. The services we expect to procure can be broken down into the following components:
 - Fast Reserve - which is a fast acting dynamic service, provided by synchronised plant, capable of delivery within 2 - 5 minutes, required to provide a load correction and frequency following service.

- Standing Reserve - which is provided by plant that is not synchronised but which can start within a defined time period. The details of this service will be described in the detailed statements associated with its procurement via tender (see Part D).
- Warming - which is required prior to Gate Closure. This may be required to ensure that there is sufficient flexible plant available at Gate Closure. It involves contracting with plant to reduce its notice to deviate from zero and be available to submit a Balancing Mechanism offer. This service may be required where there is a reasonable expectation that the plant dynamics are likely to exceed the timing of Gate Closure.
- Commercial Intertrip - this service is required to reduce the output of a generator following the tripping of a transmission line when a fault occurs. There is very limited and localised requirement for such a service.
- Emergency Assistance - this service provides for mutual support of the transmission system with other interconnected systems. These services are only required via Interconnectors.

2.2 Other Services

As indicated in Part B, “Other Services” include services which are not classified as “Ancillary Services”, but technically can provide the same effect from different service providers. Other Services may also include the purchase of energy in connection with operating the transmission system and/or doing so economically and efficiently. Purchases via bilateral forward contracts or through a recognised exchange will fall within this category.

2.3 Prohibited Activities

We are prohibited from speculative trading. Ofgem has defined this as 'actions taken in order to profit from the specific directional price move of a futures or options contract, or energy contract'. Therefore, any energy purchases (or sales) that we undertake will comply with this restriction.

2.4 Buying Energy or Selling Energy Related Contracts

Reasons why we may buy or sell energy or energy related contracts forward include:

- To meet our mean forecast requirement for balancing energy.
- To provide options to meet potential variations from the mean forecast. The Reserve Services described above may fulfil this requirement.
- To reduce the total cost of balancing the system using the Balancing Mechanism. For example, if a certain volume of offers are forecast to be required in the Balancing Mechanism (e.g. for the purposes of establishing spinning reserve), it may be economic to purchase a volume of energy forward such that a reduced volume of offers and bids are required.
- Direct Arbitrage between different balancing instruments in order to yield a lower overall balancing cost. In order not to breach the restriction on speculative trading, this would only be valid if an immediate cost saving can be obtained by directly replacing one balancing instrument to fulfil a specific requirement with another which replaces the same requirement.

PART D: PROCUREMENT MECHANISMS

1. Procurement Process

As indicated in Part B of these Guidelines, where sufficient competition exists, we will seek to contract for Balancing Services via some form of market mechanism. In other circumstances, Bilateral contracts will be entered into the service providers.

Market mechanism

This will normally be a tender based process for the selection and award of service contracts. In each case, the mechanism will include:

- a statement of our service requirements;
- the issuing of Invitation To Tender documentation, providing sufficient information to allow the provision of a service offer to be made, including standard contract terms and conditions;
- arrangements for governance of the process;
- a statement of principles and criteria that we will consider when evaluating the awarding of contracts; and
- a report providing information on previous tenders.

Bilateral Contracts

Bilateral contracts may be required where limited competition exists in the supply of a service (taking into account locational factors). This may be due to special technical requirements of the desired service, where some form of monopoly exists or the unique characteristics of certain individual providers.

Where we consider there to be a limited degree of competition, we will

- contact those service providers we believe to be capable of providing the required service or who have expressed an interest in providing the service in order to establish whether they wish to enter into a contract for the service in question; and
- offer non-discriminatory terms for the acquisition of the service.

However, if there is insufficient time to identify and contact other providers, we reserve the right to contract as appropriate to meet system security requirements.

Where we consider that no competition exists (such as the provision of a locational service), we will offer non-discriminatory terms for the acquisition of the required service.

2. Procurement Communication Media

We shall communicate any service requirement by contacting those parties that we believe may be interested in providing the service, including any existing or past service providers, and anyone that has expressed a prior interest in providing such services for the future. In addition, notification of tenders will normally be advertised in trade magazines, Financial Times and via the Internet.

3. Procurement Summary

This summary sets out the procurement mechanisms by which we expect or intend to procure those Balancing Services, set out in Part C, section 1 of these Guidelines.

BALANCING SERVICE	MEANS OF PROCUREMENT
<p>ANCILLARY SERVICES</p> <p>Mandatory Services (i.e. Part 1 services)</p> <ul style="list-style-type: none"> • Reactive Power • Frequency Response <p>Necessary Services (i.e. Part 2 services)</p> <ul style="list-style-type: none"> • Black Start • Fast Start <p>Commercial Ancillary Services</p> <p>Enhanced Reactive Services</p> <p>Commercial Frequency Response Reserve</p> <ul style="list-style-type: none"> • Fast Reserves • Standing Reserve • Warming <p>Commercial Intertrip</p> <p>Emergency Assistance</p> <p>OTHER SERVICES</p> <p>Reactive Power</p> <p>Frequency Response</p> <p>Standing Reserve</p> <p>Demand Intertrip</p> <p>Energy Related Products</p>	<p>Contracts derived from Market tenders and Bilateral contracts [see MCUSA Schedule 5]</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Contracts derived from Market tenders [see MCUSA Schedule 5]</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Contracts derived from Market tenders</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Bilateral contracts</p> <p>Contracts derived from Market tenders [see MCUSA Schedule 5]</p> <p>Bilateral contracts</p> <p>Market tenders</p> <p>Bilateral contracts</p> <p>Procured via Markets/Bilateral contracts</p>
<p>BALANCING SERVICE</p> <p>BALANCING MECHANISM OFFERS AND BIDS</p>	<p>MEANS OF PROCUREMENT</p> <p>Services are procured under the provisions of the Balancing and Settlement Code</p>

PART E: INFORMATION PROVISION

1. General Provisions

We shall publish information on the balancing services we procure. In doing so we seek to provide market participants with sufficient information without compromising the commercial position of any contracting party.

As part of the provision of information we will provide Balancing Services Adjustment Data (BSAD). The calculation methodology used is set out in a separate document.

2. Information Provision Detail

We have agreed the detail of the information provided within these Procurement Guidelines with the Director. In the circumstances where tenders are held we publish information on the outcome of these processes via market reports. This is currently the case for reactive power and standing reserve. In other cases we publish some aggregated cost and volume information on the NGC Website.

The provision of other information by NGC is contained within the BSAD Calculation Methodology.

Balancing Principles Statement

Version Date: 13 July 2000

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PART A: INTRODUCTION

1. Purpose of Document

This document sets out the Balancing Principles Statement, which we are required to establish in accordance with condition 7B of the Transmission Licence. The purpose of this Statement is to define the broad principles (the Balancing Principles) by which we will determine, at different times and in different circumstances, which Balancing Services we will use to assist in the operation of the transmission system.

This document is designed to indicate the broad framework against which we will make balancing action decisions.

Part B sets out a number of general principles relating to the development and application of this Balancing Principles Statement and Part C describes the broad principles by which we will utilise balancing measures. Part D describes the broad principles by which we undertake both the management of transmission constraints and response/reserve services and Part E sets out the processes that we will normally undertake at the day ahead and on the day to achieve system balance. Part F summarises our operational security standards that effectively define the requirements for balancing measures. In Part H we have catalogued the number of occurrences of Emergency Actions, Involuntary Reductions and other significant events over recent years.

In the event that it is necessary to modify this Balancing Principles Statement in advance of us issuing an updated version of the document, then this will be done by issuing a supplement to the Balancing Principles Statement.

This Balancing Principles Statement has been developed and approved by the Authority/Director. This Statement may only be modified in accordance with the processes set out in Condition 7B. We will review this Statement in accordance with paragraph 7(a) and provide the Authority/Director with relevant information in relation to such review in accordance with paragraph 7(b). In addition the Authority/Director will be provided with the relevant reports and statements in accordance with paragraphs (6) (a) and (b) of the Condition 7B of the Transmission Licence.

This Statement makes reference to a number of provisions contained in the Grid and Balancing and Settlement Codes. In the event that any of the relevant provisions in the Grid or Balancing and Settlement Codes are amended it may become necessary for us to seek to modify the Statement in order that it remains consistent with the Grid or Balancing and/or Settlement Codes.

In any event where our statutory obligations, provisions of the Grid Code and/or the Balancing and Settlement Code are considered inconsistent with any part of this Statement, then the relevant statutory obligation, Grid Code or Balancing and Settlement Code provisions will take precedence.

PART B: GENERAL PRINCIPLES

1 Licence Duties

The Balancing Principle Statement is written to be consistent with and to satisfy our licence obligation to “operate the Licensee’s Transmission System in an efficient, economic and co-ordinated manner” and our duty under the Transmission Licence not to discriminate in our procurement or use of Balancing Services.

Compliance with the Balancing Principles Statement by us is measured by two processes. Periodically delivering to the Director/Authority a report on the manner in which and extent to which we have, in using Balancing Services, complied with the Balancing Principles Statement. In addition we will be subject to an external audit to determine the extent to which we have, in using Balancing Services, complied with the Balancing Principles Statement. The audit statement will be made available to the Director/Authority.

2 Information Sources

We will determine what balancing measures will be employed by taking account of Balancing Mechanism Unit data, NGC’s forecast total system demand, the Transmission Outage Plan (our co-ordinated schedule of transmission plant outages) and actual system conditions (including weather conditions) and any other relevant information (where relevant is as specified in the Grid Code).

3 Balancing Measures

The balancing measures available to us constitute both Balancing Services and other actions defined in the Grid Code required for the maintenance of system security.

The Transmission Licence defines Balancing Services as:

- “(i) Ancillary Services
- (ii) offers and bids made in the Balancing Mechanism; and
- (iii) other services available to the Licensee which serve to assist the Licensee in operating the Licensee’s Transmission System in accordance with the Act or the Conditions and/or in doing so efficiently and economically”.

4 Emergency Instructions

In certain circumstances it will be necessary, in order to preserve the integrity of our transmission system and any synchronously connected external system, for us to issue ‘Emergency Instructions’. In such circumstances it may be necessary to depart from normal Balancing Mechanism (BM) operation in accordance with Balancing Code 2 (BC2.9) of the Grid Code. Examples of such circumstances that may require the issue of Emergency Instructions include:

(a) Events

Events on our transmission system or the system of another user that leads or could potentially lead to insecure system operation and for which insufficient relevant bid-offers are available to restore system security. The Grid Code defines an ‘Event’ as:

*An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a **System** (including **Embedded Power Stations**) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.*

(b) Demand Control (detailed in OC6.5, 6.6, 6.7 and 6.8)

Operating Code No. 6 (OC6) is concerned with the provisions to be made by Network Operators, and in relation to Non-

Embedded Customers by us, to permit the reduction of demand in the event of insufficient active power generation being available to meet demand, or in the event of breakdown or operating problems (such as in respect of system frequency, system voltage levels or system thermal overloads) on any part of our transmission system.

(c) **System and Localised Negative Reserve Active Power Margin** (detailed in BC2.9.4).

BC2.9.4 details the actions that we can undertake in ensuring that:

- the sum of synchronised gensets at all times are capable of reducing output sufficient to offset the loss of the largest secured demand on the system and
- synchronised gensets at all times are capable of reducing output to allow transfers to and from system constraint groups to be contained within the required limits.

In both cases this action must be sustainable.

It should be noted that if the System Negative Reserve Active Power Margin is not met then the resulting high frequency following the loss of the largest secured demand would not be abated. Similarly if Localised Negative Reserve Active Power Margins are not maintained then it may not be possible to alleviate incidences of thermal overloading, system instability and voltage problems following transmission system faults.

Where we are unable to satisfy the required System NRAPM we will select (and instruct) Gensets for De-synchronising on the basis of Bid-Offer Data submitted to us. In the case of Localised NRAPM we will select and instruct Gensets for De-

synchronising on the basis of Bid-Offer Data submitted to us and their effectiveness in restoring the Localised Negative Reserve Active Power Margin to the required level.

In the event that we are unable to differentiate between Gensets according to Bid-Offer Data and/or their effectiveness in restoring any Localised Negative Reserve Active Power Margin, we will, where time permits, select gensets taking into account their:

- effect on power flows (resulting in the minimisation of transmission losses) – Gensets that would lead to the greatest reduction in transmission losses being selected first.
- Reserve/Response capability - Gensets with a lower response/reserve capability being selected in preference to Gensets with a higher capability;
- Reactive Power contribution - Gensets with a lower reactive power capability being selected in preference to Gensets with a higher capability;
- Dynamic Parameters – Gensets with more flexible dynamic parameters being selected in preference to those with less flexible parameters;

(d) **Black Start** (Detailed in OC9)

The need to invoke the Black Start process or the Re-Synchronisation of De-Synchronised Island process in accordance with OC9.

(e) **Frequency Sensitivity** (Detailed in BC2.9.5)

The need to maintain adequate frequency sensitive Generating Units in accordance with BC2.9.5.

(f) **Communication Failure**

Where unplanned outages of the electronic data communication facilities or NGC's associated computing facilities has occurred preventing normal Balancing Mechanism operation.

Where we identify the requirement to issue Emergency Instructions, and time permits, we will do so with due regard to the following principles:

- (a) we will instruct those BMUs that are most effective in relieving the system problem;
- (b) where BMUs have a similar level of effectiveness in relieving the system problem we will select on the basis of submitted Bid-Offer Data;
- (c) where it is not possible to differentiate between the effectiveness or cost of BMUs we will instruct on the basis of:
 - effect on power flows (resulting in the minimisation of transmission losses) – BMUs that would lead to the greatest reduction in transmission losses being instructed first.
 - Reserve/Response capability - BMUs with a lower response/reserve capability being instructed in preference to Gensets with a higher capability;
 - Reactive Power contribution - BMUs with a lower reactive power capability being instructed in preference to BMUs with a higher capability.
- (d) where several BMUs have been instructed in response to an incident we will restore those units, where dynamic parameters and system conditions allow, in the reverse order of their instruction.

In the case of a Balancing Mechanism Unit (BMU), Emergency Instructions may include an instruction for the BMU to operate in a way that is not consistent with the dynamic parameters, QPNs and/or export and import limits. In all cases (with the exception of the need to invoke the Black Start process or the Re-Synchronisation of De-Synchronised Island process in accordance with OC9) where we have issued an Emergency Instruction to a BM Participant and a valid and relevant bid or offer has been submitted, then we shall log a Bid-Offer Acceptance.

5 Involuntary Reductions

Under certain, mainly exceptional, circumstances we may need to take actions that will involve the involuntary reduction of generation or demand before all valid and **relevant** Balancing Mechanism offers have been accepted. Relevant Balancing Mechanism offers are defined as those being located in the correct geographic location and/or having the required dynamic parameters to resolve the system problem in question. Reasons for such actions include:

- (i) where the call off of available offers would lead to an erosion of the system response holding below the required level. (It should be noted that an instantaneous generation loss occurring at a time of depleted response holding could lead to a frequency deviation outside of statutory limits. In the extreme case the system frequency could fall below the trigger point for automatic low frequency demand disconnection – a minimum level of 6% of total system demand)
- (ii) where automatic curtailment measures have been initiated in response to an incident

- (iii) where the acceptance of relevant offers would lead to the depletion of reactive reserves below the required levels
- (iv) where communication problems preclude the instruction of relevant bid/offers

Involuntary Reductions can arise either through our instruction (either manually or automatically) or following a system fault. Where we identify the requirement to call involuntary reductions, and time permits, we will do so with due regard to the following principles:

- (a) we will instruct Network Operators whose demand is most effective in relieving the system problem; or
- (b) we will instruct those BMUs that are most effective in relieving the system problem;
- (c) where it is not possible to differentiate between the effectiveness of Network Operators' demand (or BMUs) we will instruct those that will lead to the greatest reduction in transmission losses; and
- (d) where several Network Operators (or BMUs) have been instructed in response to an incident we will instruct the restoration of demand (or BMUs), where dynamic parameters and system conditions allow, in the reverse order of their instruction.

PART C: PRINCIPLES UNDERLYING BALANCING MEASURES

- 1 We shall be responsible for making a forecast of the transmission system demand (including transmission losses) and the periodic release of these forecasts to 'the Market' in accordance with the timetable specified in the Grid Code/Balancing and Settlement Code.

- 2 Having regard to information provided to us by BSC Parties (including their forecast levels of electricity demand and availability of generation capacity) and to the requirements of the licensed transmission system security standards, we shall undertake operational planning for the timescales year ahead to day ahead:-
 - (a) for the matching of generation output (including, if achievable, a reserve of Balancing Mechanism Units to provide a security margin sufficient to maintain an acceptable level of short term supply security) with forecast demand after taking into account:
 - (i) Balancing Mechanism Unit availability and flexibility;
 - (ii) transmission system capability;
 - (iii) electricity delivered to the transmission system from generation which is not required to submit Physical Notification (PN) data;
 - (iv) any other relevant information.

 - (b) to enable maintenance on parts of the transmission system.

- 3 We will undertake balancing measures to maintain system security at all times.

- 4 We will achieve balancing measures through the:

- (i) acceptance of offers submitted by generation and demand to the Balancing Mechanism;
- (ii) call off of ancillary service contracts;
- (iii) call off of other services which serve to assist us in operating the transmission system; and
- (iv) instruction of Emergency Actions and other Involuntary Reductions.

5 We shall call off balancing measures defined in 4(i), 4(ii) and 4(iii) in an economic order to maintain system balance. Under certain circumstances however this may not be possible. These circumstances include:

- (i) technical constraints on the transmission system;
- (ii) the dynamic operating characteristics of available generation and demand Balancing Services;
- (iii) other matters provided for in the Grid Code; and
- (iv) failure of communication links.

6 Rarely, following transmission system faults, BMUs may become instantaneously disconnected from the 'total transmission system'. Under such circumstances we would only issue a bid/offer acceptance to the affected BMU if the trade provides immediate assistance to us in controlling the total transmission system.

Following a transmission system fault which has caused disconnection a BMU can assist us in controlling the total transmission system when it can be reconnected to any part of the transmission system and is available to reconnect and return to its expected operating position in accordance with its submitted dynamics.

PART D: TRANSMISSION CONSTRAINT MANAGEMENT AND RESPONSE/RESERVE PRINCIPLES

The broad principles that we will normally employ for the management of transmission constraints and response/reserve holdings are detailed below. It should be noted that transmission constraint management involves an iterative process over all planning timescales with, where possible, continued optimisation of the system as updates to relevant information is received.

It should be further noted that an indication of the extent to which the transmission system is constrained can be gained from the margin information that we are required to release under BC1 of the Grid Code.

1 Transmission Constraint Management Principles

- Outage planning for the period year ahead to day ahead will be undertaken. In developing the outage plan for the transmission system co-ordination is required with other Network Operators.
- We will endeavour to place outages coincident with relevant generation outages in order to minimise constraint costs.
- Security analysis studies are undertaken as appropriate to confirm system security and identify constraints.
- Forecasts of constraint costs are made and the outage plan re-optimised to minimise these where possible.

- Significant changes to forecast BMU availability and/or the transmission system may trigger a reassessment of the outage plan and where possible the outage plan will be re-optimised.
- We may negotiate Balancing Services contracts to manage the financial risks associated with potential high cost outages.
- In calculating constraints we will take account of any pre and post fault actions available in order to minimise restrictions of generation capacity.
- In resolving constraints we will call off Balancing Services on an economic basis. Where services can not be differentiated on cost or flexibility the service that delivers the greatest reduction in transmission losses will be called.
- During periods of system difficulties (for example severe weather conditions) we may modify constraint limits in accordance with level of system risk. In so doing consideration of the following criteria will be given:
 - (i) the likely duration of the system difficulties;
 - (ii) the likely increase in probability of system faults arising from the system difficulties; and
 - (iii) the impact on system security of faults deemed likely to arise as a result of the system difficulties.

2 Constraint Management Processes

Transmission constraints are calculated and optimised in the following timescales: year ahead, 13 week ahead, 2 week ahead, day ahead and in the pre Gate Closure control phase. Furthermore constraints are continually monitored and optimised in real time.

2.1 Year Ahead

At the year ahead stage our Transmission Outage Plan (TOP) is developed with the following objectives:

- (i) our required maintenance and construction programme is accommodated;
- (ii) system security is achievable at all times; and
- (iii) transmission constraint costs are minimised through the co-ordinated placement of transmission outages both with other transmission outages and with generation outages.

2.2 13 Week Ahead / 2 Week Ahead / Day Ahead

The following process is undertaken in each of the above timescales the objective being to ensure system security is achieved at minimum cost whilst meeting our system maintenance and construction requirements:

- Step 1- Using our forecast of demand, BMU availability/running, BMU prices and the transmission outage plan security analysis studies are undertaken. These studies involve the running of system analysis models that can determine system voltage, thermal and stability conditions.
- Step 2 - From the output of these studies system security is assessed. If security can not be achieved then the outage plan will be reviewed and revised accordingly.
- Step 3 - Transmission constraint boundaries will be identified and further studies will be undertaken to calculate the limiting power flows across these boundaries.

Step 4 - At the day ahead stage, following receipt of PN data warming contracts may be called where appropriate to maintain system security.

Step 5 - The forecast costs of these constraints are then calculated and where necessary and possible the transmission outage plan will be revised.

2.3 Control Phase – Pre Gate Closure

In light of actual system conditions and revisions to our day-ahead forecasts, further security analysis studies will be undertaken to assess our transmission constraint requirements. Our requirements for plant warming will also be re-assessed with units being ordered to synchronised or stand down depending on the outcome of this assessment.

2.4 Control Phase – Real Time

System security will be continually monitored in real time through the use of 'on-line' security analysis studies based on actual system conditions. In light of these studies and actual BMU bidding, all transmission constraints will be continually reviewed and optimised to ensure balancing costs are minimised.

3 Response/Reserve Holding Principles

The objectives of our response/reserve holding policy shall be to provide assurance, in so far as we are able, that reasonably foreseeable levels of generation failure, shortfall and demand forecast error do not cause us to invoke involuntary demand disconnection. In so doing we shall endeavour to adopt a response/reserve holding

strategy that maintains the pre NETA level of short-term supply security.

Initially we will use pre-NETA supply security standards as a benchmark for our reserve and response policies. However we recognise that these policies may develop in the light of market circumstances and experience.

3.1 Reserve

Reserve is used to cover longer term imbalance between supply and demand caused by demand forecast error, plant failure, and the uncertainty associated with periods of rapid demand change. Reserve is also used to restore system frequency and response capability following a short-term loss. We have four categories for system reserve which are detailed below:

(a) Contingency Reserve

This will be delivered primarily through 'warming contracts' to ensure sufficient generation is available at gate-closure to meet system demand, system security and our response and reserve holding requirements. It effectively covers for longer-term (i.e. pre gate closure) plant losses and demand forecasting errors.

The initial assessment for contingency requirements will be made at the day ahead and revised through out the control phase as certainty in both demand forecasting and generation availability increases.

The requirements for contingency reserve will be based on longer-term plant loss statistics, demand forecast error and demand BMU offers.

(b) Regulating Reserve

Regulating reserve is required to cover for short-term (i.e. post gate closure) generation losses and demand forecasting errors. Regulating reserve is normally carried on part-loaded synchronised generation that is either contracted for the provision of regulating reserve or voluntarily submitting offers to the BM. In addition it may be allocated to demand BM units where they are submitting suitable offers into the BM.

(c) Standing Reserve

Standing reserve is carried by contracted short notice generation (with a delivery time of less than 20 minutes) and contracted demand that can be shut down within 20 minutes. As with regulating reserve, it is required to cover for post gate closure plant loss and demand forecasting errors.

Regulating and Standing reserves make up the total requirement dictated by post gate closure plant loss statistics and demand forecasting errors. The actual split between standing and regulating reserves will be dictated by the economics of the provision of these services from the available sources.

(d) Fast Reserves

Fast reserve is a subset of regulating/standing reserve and is required for the maintenance of system frequency within operational limits. It is provided primarily by contracted generation that is capable of significantly increasing output within 2 to 5 minutes notice.

The volumes of fast reserves are determined by our operational standard to limit the number of frequency excursions outside operational limits (lasting greater than 10 seconds) below 1500 per annum.

3.2 Response

Response is provided by sources that automatically react to frequency deviations and is required to manage instantaneous imbalances between generation and demand. There are three categories of response that we will contract for and these are detailed below:

(a) **Primary Response**

This is the automatic response to a decrease in system frequency which is increasingly effective with time over the period 0 to 10 seconds from the time of the frequency change (and fully available by the latter) and which must be sustainable for at least a further 20 seconds. In the event of a system infeed loss, primary response acts to contain the falling frequency.

(b) **Secondary Response**

This is the automatic response to a decrease in system frequency which is fully available 30 seconds from the time of the frequency change and sustainable for at least 30 minutes. In the event of a system infeed loss secondary response acts to restore the system frequency to operational limits.

(c) **High Frequency Response**

This is the automatic response (of reducing output from generation) to an increase in system frequency which is increasingly effective with time over the period 0 to 10 seconds from the time of the frequency change (and fully available by the

latter) and which must be maintained (at no lesser reduction) thereafter.

The primary and secondary response requirement will be determined by the magnitude of the largest generation infeed and the level of system inertia. [*System inertia is generally proportional to system demand and the higher the inertia (demand) the less response is required to contain a generation loss*].

Similarly the high frequency response requirement will be determined by the magnitude of the largest secured demand and the level of system inertia.

Response can be delivered by both dynamic (or continuous) and non-dynamic (or occasional) sources. Dynamic response is delivered continuously as system frequency deviates from target and is provided by part loaded generation. Non-dynamic response is delivered only when the system frequency reaches a set trigger point and is predominantly provided by contracted demand armed with low frequency relays.

In order that frequency can be contained within operational limits, and thereby minimise the risk of frequency falling outside of statutory limits, a minimum dynamic response requirement exists. The actual level of this minimum dynamic requirement is determined by our operational requirement to maintain the standard deviation of 5 minute spot frequency to 0.07Hz.

3.3 Principles Relating to Response and Reserve Holding.

- We will calculate response and reserve holding levels based on the following criteria:
 - (i) BMU loss statistics
 - (ii) the largest generation infeed being covered

- (iii) the largest secured system demand
 - (iv) demand forecast statistics
 - (v) system characteristics such as inertia and load response
 - (vi) judgement of levels of demand volatility/uncertainty
 - (vii) judgement of levels of generation uncertainty
- We will allocate response and reserve holding with due regard to:
 - (i) cost
 - (ii) dynamics of delivery
 - (iii) transmission constraints
 - We will not allocate response/reserve to constrained BMUs if the delivery of that response/reserve would result in violation of the constraint.
 - During system difficulties (caused for example by severe weather conditions) we may strategically allocate response/reserve on a geographic basis to manage system risk. In so doing consideration will be given to the following criteria:
 - (i) the likely duration of the system difficulties
 - (ii) the parts of the system affected by the system difficulties
 - (iii) the likely increase in probability of response/reserve holding being affected by the system difficulties
 - At all times we will endeavour to maintain sufficient levels of response on the system in order that the loss of the largest generation infeed would not result in a violation of the security standards.
 - Following an event that leads to the delivery of response we will, as soon as is practical, take action to regain the level of response holding on the system such that system security standards would not be violated following a further generation infeed loss. Such

action includes the instructing of standing reserve such that responsive BMUs can be brought back to their respective response holding levels.

- We will hold sufficient high frequency response on the system to ensure that security standards are not compromised should the largest secured demand on the system trip.
- In achieving the above we will ensure that there is a suitable level of generation capable of reducing output on the system at all times.

PART E: DAY AHEAD AND WITHIN DAY BALANCING

1. Day Ahead Balancing Process – Scheduling Phase

- Step 1 - By 09:00 hours each day we will publish our day ahead demand forecast covering the period 05:00 hours day ahead to 05:00 hours day ahead + 1.
- Step 2 - By 11:00 hours we will receive Physical Notification (PN) and other data from all Balancing Mechanism Units (BMUs) covering the period 05:00 hours day ahead to 05:00 hours day ahead + 1 and default such data as is necessary.
- Step 3 - Using the submitted PN (and other BMU) data and NGC's demand forecast we will calculate the available national plant margin or shortfall (accounting for the reserve of BMUs to provide the required security margin) for each half hour period.
- Step 4 - Using the submitted PN data, demand forecast and planned transmission outage information we will undertake security analysis studies to verify system security (Part F refers).
- Step 5 - By 12:00 hours each day we will issue the total system plant margin data to the market for the period 05:00 hours day ahead to 05:00 hours day ahead + 1.
- Step 6 - We will forecast constraint costs based on the submitted indicative PN (and other BMU) data and our estimation of Final Physical Notification (FPN) levels and bid/offer prices and volumes. Depending on the forecast the levels of these costs

we will give consideration to the cancellation/deferral of transmission system outages.

- Step 7 - Where judged necessary we will call off the most economic Balancing Services contracts to ensure, inter alia, that BMUs required to maintain system security are available for selection in the Balancing Mechanism.
- Step 8 - Following 11:00 hours we will continue to receive updated PNs from BMUs.
- Step 9 - Using this updated data we will revise the national plant margin data and publish this together with zonal margin data by 16:00 hrs.

2. Within Day Balancing Process – Control Phase

- Step 1 - At defined times, prior to gate closure, we will revise and publish half-hourly averaged demand forecasts for a defined period.
- Step 2 - As participants become aware of changes to their physical position they will be expected to advise us.
- Step 3 - At defined times, using the latest demand forecast, PN and other BMU data, the zonal and national margins will be reassessed and provided to the market.
- Step 4 - Using the revised data we will undertake security analysis studies and reassess the requirements for the call off of Balancing Services contracts.

Step 5 - At gate closure the PN data will become FPN data and we will have received Bid/Offer prices and volumes for those BMUs wishing to actively participate in the Balancing Mechanism.

Step 6 - In the Balancing Mechanism, using the revised demand forecast and validated FPN and Bid/Offer data, we will seek to balance the system (on a minute by minute basis) through the purchase of Balancing Services on an economic basis taking into account:

- (i) technical constraint imposed on the system from time to time;
- (ii) the dynamic operating characteristics of available generation and demand balancing services;
- (iii) uncertainty in demand at timescales within the Balancing Mechanism window;
- (iv) other matters provided for in the Grid Code

In extreme situations this may require the instruction of Emergency Instructions and/or Involuntary Reductions as defined in Part B Sections 3 and 4.

PART F: SUMMARY OF OPERATIONAL SECURITY STANDARDS

1 Overview

We shall economically maintain security on the transmission system such that for normal and outage conditions, for a **secured event** there shall not be:-

- a loss of supply,
- a violation of the **system frequency control standard**,
- a violation of the **system voltage control standard**,
- system instability,
- unacceptable overloading of apparatus.

Excluding the exceptions below a **secured event** is defined as the fault outage of:-

- a single circuit overhead line,
- a double circuit overhead line,
- a designated pair of single circuit overhead lines concurrently during the defined winter season,
- a single circuit cable,
- a section of busbars or mesh corner,
- a supergrid transformer,
- a reactive compensator,
- the most onerous single system infeed.

For demand groups with a net import of up to 1500MW a **secured event** is defined as the fault outage of:-

- a single circuit overhead line,
- a single circuit cable,

- a supergrid or grid transformer or reactor,
- the most onerous single system infeed.

1.1 Exceptions

The standards may be relaxed for connections for which a derogation (approved by the Director/Authority) to Condition 12 of the Transmission Licence is in force.

For demand groups with a net import of less than 300MW and under outage conditions then for a **secured event** a loss of supply is acceptable.

Loss of supply for a **secured event** is also acceptable under planned outage conditions subject to a restoration strategy agreed between the SO and the relevant party.

2 System Frequency Control Standard

We shall economically purchase and schedule sufficient MW reserve and response such that:

For a **significant event i.e.** any **secured event** which could result in sudden change between total mechanical power input and actual system demand which is in the range 300MW to 1000MW the system frequency shall not deviate by more than 0.5Hz and that for;

An **abnormal event i.e.** any **secured event** which could result in a sudden change between total mechanical power input and actual system demand which is in the range 1000MW to 1320MW the system frequency should not deviate by more than 0.8Hz.

For either significant or abnormal events any frequency deviation below 49.5Hz should not persist for more than 60 seconds, and system frequency should return to between operational limits

within 10 minutes. If necessary we shall achieve, in exceptional circumstances, frequency control by demand control – as required by the British Grid Systems Agreement and as specified in the Grid Code.

3 Voltage Control Standard

Under normal system conditions we shall purchase and economically schedule sufficient Mvar reserves in order to maintain steady state voltage levels such that:-

On the 400kV system each user connection site will normally remain within +/- 5% of the nominal value with a minimum/maximum range of +/-10% however voltages between +5% and +10% should not last longer than 15 minutes.

On the 275kV and 132kV system each user connection site will normally remain within +/- 10%.

Below 132kV the limits are +/- 6%.

In addition for any **secured event** we shall purchase and economically schedule sufficient Mvar reserves in order to limit voltage step change to:-

+/-6% at the user connection site after a **secured event**, relaxed to +/-12% for loss of a double circuit, busbar or mesh corner. This voltage step change relates to a period about 5 seconds after fault clearance. It must be possible for us to restore voltage at GSPs to 95% following automatic and manual action within 20 minutes.

+/- 3% at the user connection site for planned switch operations.

PART G: EXCEPTIONS TO THE BALANCING PRINCIPLES STATEMENT

Infrequently circumstances may arise which require us to operate outside the principles detailed in this statement. Such circumstances are listed below:

- (i) Black Start events,
- (ii) where parts of the transmission system have become islanded
- (iii) when emergency evacuation procedures have been invoked at our control centres or wide spread communication problems are experienced,
- (iv) where circumstances exist where not to do so would prejudice the safe and secure operation of the transmission system or would be in breach of statutory obligations,
- (v) where operational information indicates insufficient time is available to employ particular measures in accordance with the Statement if balancing is to be achieved; and
- (vi) where the Statement has been shown to be inappropriate and the Balancing Principles Statement modification procedures have been implemented but not completed.

For parts (i) to (iii) above we would issue the appropriate system warning in accordance with the Grid Code and occurrences of any of the circumstances above would be reported in our annual statement of performance against the Balancing Principles.

**PART H: INCIDENCES OF EMERGENCY INSTRUCTIONS,
INVOLUNTARY REDUCTIONS AND OTHER SIGNIFICANT
EVENTS**

Event	1997/1998	1998/1999	1999/2000
Emergency Instructions	TBA	TBA	TBA
Involuntary Reductions	TBA	TBA	TBA
Generator Disconnection following a system fault	TBA	TBA	TBA
Black Starts	TBA	TBA	TBA

TBA – To Be Advised

'END'

**Appendix 5 Draft Balancing Services Adjustment Data
Methodology**

**BALANCING SERVICES
ADJUSTMENT DATA**

CALCULATION METHODOLOGY

Draft Version Date: 13 July 2000

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PART A: INTRODUCTION

1. Purpose of Document

This document sets out the Balancing Services Adjustment Data - Calculation Methodology ("Calculation Methodology") which The National Grid Company plc is required to establish in accordance with Licence Condition 7B of its Transmission Licence. The purpose of this Calculation Methodology is to set out the information on Relevant Balancing Services contracts that will feed into the calculation of imbalance cash out prices.

In the event that it is necessary to modify this Calculation Methodology in advance of issuing an updated version of this document, then this will be done by issuing a supplement to this Calculation Methodology.

We have developed the Calculation Methodology in consultation with the Authority/Director. The Calculation Methodology may be modified in accordance with the processes set out in Transmission Licence Condition 7B. Where we intend to buy or acquire any Relevant Balancing Services of a kind or under a mechanism which is not covered by this Calculation Methodology then the Calculation Methodology shall be revised in accordance with the relevant provisions of Transmission Licence Condition 7B.

The Calculation Methodology makes reference to a number of definitions contained in the Grid Code and Balancing and Settlement Code. In the event that any of the relevant provisions in the Grid Code or Balancing and Settlement Code are amended it may become necessary to modify the Calculation Methodology in order that it remains consistent with the Grid Code or Balancing and Settlement Code.

In any event, where the provisions of the Grid Code and/or the Balancing and Settlement Code are considered inconsistent with any part of this Calculation Methodology, then the Grid Code or Balancing and Settlement Code provision will take precedence.

PART B: BALANCING SERVICES ADJUSTMENT DATA

1. Calculation Methodology

1.1 Variables included in the BSAD

The BSAD is specified in Section Q, Paragraph 6.3 of the Balancing and Settlement Code and includes:

- (i) BCA – Buy Price Cost Adjustment;
- (ii) SCA – Sell Price Cost Adjustment;
- (iii) BVA – Buy Price Volume Adjustment; and
- (iv) SVA – Sell Price Volume Adjustment.

This data is used in the calculation of the System Sell Price and the System Buy Price as specified in Section T, Paragraph 4.4 of the Balancing and Settlement Code.

1.2 Balancing Services contract costs for inclusion in the BSAD

The following Balancing Services contracts will be included in the calculation of the BSAD:

- **Standing Reserve** – Includes any option fees (£) for service availability during specific half-hour periods. The calculation will include option fees paid to all service providers regardless of whether or not they participate in the Balancing Mechanism.
- **Regulating Reserve** – Includes any option fees (£) for firm service availability for regulating reserve services.

Standing and Regulating Reserve options for increasing generation or reducing demand will feed into the calculation of the BCA

Standing and Regulating Reserve options for reducing generation or increasing demand will feed into the calculation of the SCA

- **Forward energy contracts** – Both the costs and volumes of any forward energy contracts will be included in the calculations. Where the:
 - costs and volumes of any energy purchases feed into BCA and BVA respectively; and
 - costs and volumes of any energy sales feed into SCA and SVA respectively.

All costs and volumes will be targeted to the half-hours in which they are incurred/utilised.

For contracts covering bundled services, we will attempt to accurately identify the costs associated with each particular service. If this cannot be achieved then we will allocate the costs equally to each of the contracted services.

1.3 Data Provision

Data will be submitted to the Balancing Mechanism Reporting Agent (BMRA) at or before 5pm each day to cover the 24 hour period from half-hour ending 00:30 to half-hour ending 24:00 for the following day.

1.4 Basis of Data

The calculation of the BSAD will be performed on the following basis:

- Reserve availability will be calculated on the basis of week ahead submissions of availability from service providers;
- If no week ahead submission is received then maximum availability will be assumed; and
- Any forward energy contracts struck prior to the submission of BSAD at 5pm at the day-ahead stage will be included.

1.5 Re-submission of Data

The BSAD will be re-submitted, if required, post event to cover:

- The correction of any manifest errors in the original submission;
- Adjustments to any of the variables to account for any forward energy contracts entered into between the day ahead and real time that were not included in the original submission; and
- Inclusion of any changes caused by the utilisation of contracts with 'difference' payments. This may result in revisions to BCA and SCA.

The re-submission will be made in sufficient time to enable the incorporation of the revised BSAD into the calculation of SSP and SBP in the interim settlement run.

Appendix 6 Draft Proposed Modifications to Condition 4A and Schedule 3 Part B of NGC's Transmission Licence

[The content of this licence condition is subject to further consultation as discussed in chapters five and six of this document.]

CONDITION 4F: REVISED RESTRICTIONS ON REVENUE

The Restrictions on Revenue

GENERAL

1. (a) In this Condition, any cost, charge, payment or amount may be either positive or negative.

(b) Any algebraic term defined in any paragraph of the Condition shall have that meaning in any other paragraph of this Condition.

(c) For the purposes of paragraph [15] and Part B of Schedule 3, the relevant year commencing on 1 April 2000 shall be deemed to be a period commencing on that date and ending on (and including) the day on which the Effective Time occurs, and the relevant year ending on 31 March 2002 shall be deemed to be a period commencing on (and including) the day on which the Effective Time occurs and ending on 31 March 2002.

PART 1

2. Transmission Network Revenue Restriction

The licensee shall use its best endeavours to ensure that in any relevant year the revenue from the Transmission Business (other than the revenue from the Balancing Services Activity and excluded services) shall not exceed the maximum revenue, which shall be calculated in accordance with the following formula:

$$M_t = \left[1 + \frac{RPI_t - X_g}{100} \right] P_{t-1} - D_t - K_t$$

Where:

M_t means the maximum revenue in relevant year t.

RPI_t means the percentage change (whether of a positive or a negative value) in the arithmetic average of the Retail Price Index published or determined with respect to each of the six months from May to October (both inclusive) in relevant year t-1 and that published or determined with respect to the same months in relevant year t-2.

X_g means four percent.

P_{t-1} means the amount derived from the following formula:

$$P_{t-1} = P_{t-2} \left[1 + \frac{RPI_{t-1} - X_g}{100} \right]$$

[but in relation to the relevant year commencing on 1 April 1997 P_{t-1} shall have a value equal to [£ 868 100 000], and in relation to the relevant year commencing on 1 April 1998 P_{t-2} shall have that value.]⁹⁰

D_t means a correction factor to be applied to transmission network revenue and is equal to the value of user maintenance in relevant year t.

K_t means the correction factor (whether of a positive or negative value) which is derived from the formula at paragraph [3], [but in relation to the relevant year commencing on 1 April 1997 K_t shall, subject to paragraph 3 of Condition 4B, be equal to an amount derived from the formula set out in paragraph 3 less [£ 36 800 000].]⁹¹

⁹⁰ This drafting is now seen to be superfluous and may be removed from the final draft.

⁹¹ This drafting is now seen to be superfluous and may be removed from the final draft.

3. For the purpose of paragraph [2], the term K_t (being the correction factor to be applied to transmission network revenue for the relevant year t) shall be derived from the following formula:

$$K_t = (C_{t-1} - M_{t-1}) \left(1 + \frac{I_t}{100} \right)$$

Where:

C_{t-1} means, subject to paragraph 3 of Condition 4B, the transmission network revenue in relevant year $t-1$.

M_{t-1} means the maximum revenue in relevant year $t-1$.

I_t means the interest rate in relevant year t which is equal to, where K_t (taking no account of I for this purpose) has a positive value and the transmission network revenue in relevant year $t-1$ exceeds the maximum revenue in relevant year $t-1$ by more than 2 per cent, the average specified rate plus 4 or, where K_t (taking no account of I for this purpose) has a negative value or the transmission network revenue in relevant year $t-1$ does not exceed the maximum revenue year $t-1$ by more than 2 per cent, the average specified rate.

PART 2

Balancing Services Activity Revenue

4. The licensee shall use its best endeavours to ensure that in any relevant year, the total revenue from the Balancing Services Activity shall not exceed an amount calculated in accordance with the following formula:

$$BX_t = CSOBM_t + BSCC_t + ET_t + NRC_t + RT_t - OM_t + Incpay_t$$

Where

BX_t is the total revenue from the Balancing Services Activity for relevant year t ;

- CSOBM_t means the cost to the licensee of bids and offers in the Balancing Mechanism accepted by the licensee in relevant year t, and is the sum of the values of CSOBM_j (as contemplated in the BSC) across the relevant year t` ;
- BSCC_t means the costs to the licensee of contracts for the availability or use of Balancing Services in relevant year t, excluding costs within CSOBM_t but including charges made by the licensee for the provision of Balancing Services to itself in relevant year;
- ET_t means the amount of any adjustment to be made in the relevant year t in respect of a previous relevant year as provided in paragraph [14];
- NRC_t has the value given in paragraph [12], and represents the costs (other than the costs of Balancing Services) of the licensee in operating the licensee's transmission system in relevant year t, including its costs in preparing for the introduction of the BSC and any ongoing costs of operating the system incurred as a result of the operation of the BSC;
- RT_t means the amount of any allowed income adjustments given by paragraph [6](b) in respect of relevant year t;
- OM_t means an amount representing the revenue from the provision of Balancing Services to others in relevant year t, calculated in accordance with paragraph [8]; and
- Incpay_t means an incentive payment for relevant year t calculated in accordance with Part 2 of this Condition.

Income Adjusting Events

5. (a) An income adjusting event is any of the following:
- (i) an event or circumstance constituting Force Majeure under the BSC;
 - (ii) an event or circumstance constituting Force Majeure under the Master Agreement dated 30 March 1990 as amended made between the

licensee and others and providing for connection to and use of the licensee's transmission system;

- (iii) a security period as defined in Condition 4D; and
- (iv) an event which, at the time when it occurs, is an approved income adjusting event as provided for in sub-paragraph (b).

(b) An approved income adjusting event is one which, at the time when it occurs, has been, or is within a category of events which has been proposed to the Director by the licensee as an income adjusting event and approved as such by the Director;

(c) The Director's approval of each income adjusting event shall be in writing, shall be copied to the licensee and shall be in the public domain; and the Director may revoke this approval with the consent of the licensee.

6. (a) Where it appears to the licensee that there have been in respect of relevant year t costs and/or expenses which:

- (i) have been caused or saved by an income adjusting event; and
- (ii) have, for relevant year t, increased or decreased by more than [£2,000,000]⁹² the amount specified for this purpose in Part 2 of this Condition,

then the licensee may give notice thereof to the Director.

(b) Where it appears to any other party (parties)⁹³ that there have been in respect of relevant year t costs and/or expenses which:

⁹² Ofgem is considering this parameter, although we have proposed that it should remain at £ 2,000,000.

⁹³ Where party and / or parties refers to a party and / or those parties directly charged for BSUoS charges as contemplated within the BSC.

- (i) have been caused or saved by an income adjusting event; and
- (ii) have, for the relevant year t, increased or decreased by more than [£2000000] the amount specified for this purpose in Part 2 of this Condition

then that party may give notice thereof to the Director.

(c) The notice provided for in sub-paragraphs (a) and (b) shall give particulars of:

- (i) the income adjusting event to which the notice relates, the amount of the costs and/or expenses which appear to have been caused or saved by the event and the method of calculating such costs and/or expenses; and
- (ii) the amount of any allowed income adjustment proposed as a consequence of that income adjusting event.

(d) A notice of an income adjusting event shall be given as soon as is reasonably practicable after the occurrence of the income adjusting event, and may not be given more than 3 months after the end of the relevant year in which it occurs.

7. (a) The Director shall determine (after consultation with the licensee and such other persons as he considers desirable):

- (i) whether any or all of the costs and/or expenses given in a notice given pursuant to paragraph [6] are caused or saved by an income adjusting event;
- (ii) whether the amount specified for the purpose of paragraph [6](a) (ii) has increased or decreased by more than [£2,000,000]; and

- (iii) if so, whether the amount of the proposed allowed income adjustment ensures that the financial position and performance of licensee are, in so far as is reasonably practicable, the same as if that income adjusting event had not taken place, and if not what allowed income adjustment would secure that effect.
- (b) In relation to any relevant year, the allowed income adjustment shall be:
- (i) the values determined by the Director under sub-paragraph (a);
 - (ii) if the Director has not made a determination in accordance with sub-paragraph (a) within 3 months of the date of the notice under paragraph [6], the respective values given to him by the licensee and / the party (parties) in that notice; or
 - (iii) in any other case, zero.

Provision of Balancing Services to Others

8. For the purpose of paragraph [4], OM_t (the amount representing the revenue from the provision of Balancing services to others) shall be the sum of:
- (a) The total amount (exclusive of interest and value added tax attributable thereto) recovered by the licensee in respect of that year t under any agreements entered into between a public electricity supplier or Other Network Operator (each as defined in the Grid Code) and the licensee pursuant to which the costs of operation or non-operation of generation sets which are required to support the stability of a User System (as defined in the Grid Code) are charged to such public electricity supplier or Other Network Operator; and
 - (b) The total costs (exclusive of interest and value added tax attributable thereto) incurred by the licensee in respect of that year t which arise by reason of the operation or non-operation of generation sets and which results directly or indirectly from works associated with the licensee's transmission system or

works being carried out, rescheduled or cancelled by reason of any agreement with, or request of, any third party other than a public electricity supplier or Other Network Operator (each as defined in the Grid Code).

Information about the Balancing Services Activity revenue restriction

9. (a) Not later than 3 months after the end of each relevant year the licensee shall send to the Director a statement giving the value for that relevant year of the terms specified in sub-paragraph (c);
- (b) The statement referred to in sub-paragraph (a) shall:
- i. be certified by a director of the licensee on behalf of the licensee that to the best of his knowledge, information and belief having made all reasonable enquiries:
- (A) there is no amount included in its calculations of the terms specified in sub-paragraph (c) which represents other than an amount permitted to be included by this Condition; and
- (B) all amounts of which the licensee is aware and which should properly be taken into account for the purposes of this Condition have been taken into account; and
- ii. accompanied by a report from the Auditors that in their opinion:
- (A) such statement fairly presents the value of each of the terms specified in sub-paragraph (c) in accordance with the requirements of this Condition; and
- (B) the amounts shown in respect of each of those terms are in accordance with the licensee's accounting records which have been maintained in accordance with Condition 3.

(c) The terms specified in this sub-paragraph are:

CSOBM_t, BSCC_t, NRC_t, RT_t, OM_t, ET_t and IncPay_t

Determination of Incentive Payments

10. The term Incpay_t, which is provided for in paragraph [4], is derived as follows:

(a) If A_t is greater than or equal to CP_t then Incpay_t = CP_t

(b) If A_t is less than or equal to CL_t then Incpay_t = CL_t

(c) In any other cases, Incpay_t = A_t

Where

A_t equals SF_t * (MT_t – IBC_t)

CP_t which represents the upper limit of IncPay_t, has the value specified for the relevant year t in the appropriate table in paragraph B1 of Part B of Schedule 3;

CL_t which represents the lower limit of Incpay_t, has the value specified for the relevant year in the appropriate table in paragraph B1 of Part B of Schedule 3;

SF_t which is the Balancing Services Activity sharing factor in respect of relevant year t, has the value specified for the relevant year t in the appropriate table in paragraph B1 in Part B of Schedule 3;

MT_t which is the target for Balancing Services Activity Revenue in respect of relevant year t, has the value specified for relevant year t in the appropriate table in paragraph B1 in Part B of Schedule 3;

IBCT_t which is the annual cost of balancing services on which the licensee is incentivised, is calculated in accordance with the formula given in paragraph [11].

11. IBCT_t, in respect of relevant year t shall be calculated in accordance with the following formula:

$$IBCT_t = CSOBM_t + BSCC_t + (TL_t * TLRP_t) - (TQEI_t * NIRP_t) - OM_t$$

Where

TL_t is given by the sum of BM Unit Metered Volumes (as defined in the BSC) in the relevant year t for all BM Units (as defined in the BSC), representing transmission losses in relevant year t expressed as MWh, and being the difference between the quantities of electricity delivered to the licensee's transmission system in relevant year t and the quantity taken from the licensee's transmission system in relevant year t, but excluding all transformer losses;

TLRP_t which is the transmission losses reference price, has the value specified for relevant year t in the appropriate table in paragraph B1 in Part B of Schedule 3;

TQEI_t which is the total net energy imbalance volume, is the sum of the values of TQEI_j (as defined in the BSC) across relevant year t;

NIRP_t which is the net imbalance volume reference price has the value for the relevant year t as calculated in accordance with paragraph B2 in Part B of Schedule 3.

12. NRC_t, which is a term introduced in paragraph [4], shall in respect of relevant year t be calculated in accordance with the following formula:

$$NRC_t = AS_t + SO_t + NS_t$$

Where

AS_t represents the internal costs which the licensee incurs in operating its Ancillary Services Business and Transmission Services Scheme (being the costs provided for in Condition 4A in the form in which it existed on 1 April 2000) and has the value specified for relevant year t in the appropriate table in paragraph B3 in Part B of Schedule 3;

SO_t represents the internal costs of system operation including any on-going costs incurred by the licensee in operating the system incurred as a result of the operation of the BSC, and has the value specified for relevant year t in the appropriate table in paragraph B3 in Part B of Schedule 3;

NS_t represents the additional costs incurred by the licensee in preparing for the introduction of the new electricity trading arrangements and has the value specified for relevant year t in the appropriate table in paragraph B3 in Part B of Schedule 3.

13. The figure specified for the purpose of paragraph [6] (a)(ii) is the aggregate of $CSOBM_t + BSCC_t$

14. ET_t , which is a term introduced in paragraph [4], means in respect of relevant year t

(a) the costs, whether positive or negative, to the licensee of

- ◆ bids and offers in the Balancing Mechanism accepted by the licensee in any year before relevant year t ; and
- ◆ contracts for the availability or use of Balancing Services in any year before relevant year t , excluding costs within $CSOBM_t$ for any year, but including charges made by the licensee for the provision of Balancing Services to itself in any year before relevant year t

in each case after deducting such costs to the extent that they have been taken into account in any year in computing the terms CSOBM_t or BSCC_t; and

- (b) any amount, within the term ET_t as defined in this licence in the form it was in on 1 April 2000 excluding any part thereof already taken into account for the purpose of the term ET_t, whether as then defined or as now defined.

Transitional Provisions

- 15. [Notwithstanding the revocation of Condition 4A, for the relevant year commencing on 1 April 2000 (which has a meaning given by paragraph 1(c)) Part 2 of Condition 4A in the form in which it existed on 1 April 2000 shall apply.]⁹⁴

⁹⁴ Inclusion of paragraph 15 to be confirmed.

SCHEDULE 3, PART B

Terms used in the Balancing Services Activity revenue restriction

B1. In paragraphs [10 and 11] of Condition 4F, the terms MT_t , SF_t , CP_t , CL_t , and $TLRP_t$ shall have the values specified in the following tables:

a. in respect of the relevant year ending on 31 March 2002:

MT_t (£)	$\max(0, {}^d2002 - 365) * [] + \min({}^d2002, 365) * []$
SF_t	$[]$
CP_t (£)	$[] * {}^d2002 / 365$
CL_t (£)	$[] * {}^d2002 / 365$
$TLRP_t$ (£/MWh)	$[]$

where d2002 equals the number of days from (and including) the day in which the Effective Time occurs to (and including) 31 March 2002.

b. in respect of a relevant year commencing on or after 1 April 2002:

MT_t (£)	$[] (1 + (RPI_t / 100)) + IBC_{t-1} (1 + (RPI_t / 100))$
SF_t	$[]$
CP_t (£)	$CP_{t-1} (1 + (RPI_t / 100))$
CL_t (£)	$CL_{t-1} (1 + (RPI_t / 100))$
$TLRP_t$ (£/MWh)	$[]$

B2. $[NIRP_t]$ ⁹⁵

B3. In paragraph [12] of Condition 4F, the terms AS_t , SO_t and NS_t shall have the values specified in the following tables:

⁹⁵ The determination of this term is to be decided.

- a) in respect of the year ending on 31 March 2001

AS _t (£)	6 100 000 * _d 2001/365
SO _t (£)	0
NS _t (£)	3 900 000

where _d2001 equals the number of whole days from (and including) the day on which the Effective Time occurs to (and including) 31 March 2001; and

- b) in respect of a relevant year commencing on or after 1 April 2001 AS_t = 0, [SO_t and NS_t to be agreed.]⁹⁶

- B4. [For the purpose of the definition of the term TU_d in paragraph [7] of Part 2 of Condition 4A(4F), the following Agreed Procedure is specified:

AP14

as amended varied, substituted, replaced or restated from time to time.]⁹⁷

- B5. For the purposes of paragraph B1 of this Schedule, the term RPI_t shall have the meaning attributed to in paragraph [2] of Condition 4F.

⁹⁶ Given that Ofgem has developed the TO price control to run for 4-5 years, Ofgem intends that the recovery of SO internal costs and thus the SO Price Control to operate for a commensurate length of time. The relevant changes to this licence condition will be proposed at the time of the final proposals on the SO Price Control due in January 2001.

⁹⁷ The inclusion of AP 14 to be confirmed but it is likely to be removed.