

**The National Grid Company plc.**



**NGC Reactive Market Report**

**Fourth Tender Round for Obligatory and  
Enhanced Reactive Power Services**

**Effective from 1 October 1999**

# 11 November 1999

## NGC Reactive Market Report - November 1999

### Executive Summary

This market report provides details on the fourth tender round process for contracts commencing 1 October 1999, successful tender data and those that progressed to contract. Included are estimates of the NGC transmission system utilisation for the six-month period April to September 1999 and a chapter reviewing the performance of the market to date.

On 10 June 1999, National Grid Company plc (NGC) held the fourth Reactive Power Market tender round. This enabled relevant Users providing the minimum Grid Code Obligatory Service to offer alternative payment terms to the default payment arrangements for the provision of voltage support to the NGC Transmission System. Furthermore, this mechanism also permits Users the opportunity to provide reactive power capability in excess of the Grid Code obligations, together with any other eligible Service Provider able to provide a meaningful service - a so called "Enhanced Reactive Power Service".

NGC evaluated all the tenders received against economic purchase and technical performance criteria in accordance with the agreed terms of the market mechanism. On 13 August 1999 tenderers were notified of the results of their respective tenders. The main points are as follows:

- X Tenders were received from 20 generating units, from a total of 99 eligible gensets able to tender on 10 June 'Market Day'.
- X All tenders received were from Centrally Despatched generating units, and were for the Grid Code Obligatory Service only.
- X Tenders received were for contract durations of both 12 and 24 months.
- X Tenderers included both portfolio and independent generating companies.
- X Of the 20 tenders evaluated, NGC offered Market Agreements to 5; all of which proceeded to contract.

Therefore, currently and until 31 March 2000 there are a total of 63 gensets on a reactive Market Agreement, i.e. 1 from tender round two, 57 from tender round three and 5 from this, the fourth tender round.

The next market day for Market Agreements commencing on 1 April 2000 is 3 December 1999. Invitation To Tender (ITT) packs have been available on request since 7 October 1999 for Users wishing to submit a tender. Gensets with Market Agreements in place from 1 October 1999 will not be eligible to participate until the sixth contract round at the earliest for the period 1 October 2000 to 30 September 2001.

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## **1 Introduction**

- 1.1 This market report provides information and results of the tender evaluation process, and describes the contractual position for the provision of Reactive Power services to the NGC Transmission system for the year 1 October 1999 to 30 September 2000.
- 1.2 This report also sets the outcome of this fourth Reactive Power Market Tender Round against the context of the previous tender rounds and the services delivered to the NGC Transmission System from 1 April to 30 September 1999.
- 1.3 Included are estimates of the NGC transmission system utilisation for the period April to September 1999.
- 1.4 Under the provisions of Schedule 5 of the Master Connection and Use of System Agreement (MCUSA Schedule 5) the Default Payment Mechanism (DPM) states that reactive payments are split between capability and utilisation. For the period 1 April 1999 to 31 March 2000 the split is 25:75 for capability and utilisation respectively. However, from 1 April 2000 onwards, the capability element of the DPM will cease and default reactive payments will be made on metered reactive utilisation only.

## **2 Voltage Requirements**

- 2.1 NGC manages the voltage of the supergrid system, to meet Transmission Licence requirements for secure and stable power transmission and to ensure quality of supply to customers. Voltages are largely determined by the flows of reactive power on the system. NGC ensures that reactive power resources are provided on a local basis to meet the constantly varying needs of the system and that there is sufficient reactive power reserve made available to meet contingencies.
- 2.2 Generating Units provide reactive power capability, and have the ability to vary their reactive power output, as a requirement of the Grid Code. The power system itself has inherent reactive gains and losses, which vary in accordance with changes in power flows and voltage. NGC installs reactive compensation plant in parts of the system where there is insufficient generator reactive capability to meet requirements and where voltages cannot be regulated effectively or economically by other means.
- 2.3 Dynamic reserves of reactive power are essential for system operation. NGC value reactive capability as it gives rise to increased confidence in the availability of a post-fault service. Although the capability element of the DPM has concluded, NGC still seek capability based market agreements especially in critical locations to ensure post fault reserves are maintained.
- 2.4 NGC may also contract for generator reactive power capability in excess of that required by the Grid Code, or for other services to help manage the voltage characteristics of the NGC

Transmission system.

### **3 Results of fourth tender round**

#### **3.1 Nature of tenders received**

- 3.11 Tenders were received from 20 gensets at 11 power stations, representing 4 Generators and covering 2 fuel types.
- 3.12 One of the tenders received was from a company not having tendered in the Reactive Market before.
- 3.13 All tenders received were from Centrally Despatched gensets for the Grid Code Obligatory Reactive Power Service (ORPS). Six tenders allowed for contract durations of two years, the remaining being for the minimum period of 12 months only. No tenders were received for the provision of Enhanced Reactive Power Services (ERPS).
- 3.14 All tenders were compliant with the Invitation to Tender documentation.
- 3.15 Of those tenders received, the majority appeared to be seeking greater remuneration of their reactive power capability, although still broadly following the payment profile of the DPM.
- 3.16 A few tenders opted for a simple structure of Available Capability payments, reflecting a linear payment rate per Mvar of reactive power available. However, about one third of the tenders received offered a 'flat' Available Capability payment rate. Most other tenders included an incentive in the form of a more 'kinked' structure of payment (based around steeper incremental capability prices at higher Mvar outputs), under which the genset loses a greater proportion of money for a small shortfall in reactive power capability.
- 3.17 Most tenders included capability prices for hours available; but only 20% of those tendered wished to be paid capability money on the basis of hours synchronised.

#### **3.2 Tender Assessment**

- 3.21 Tender assessment was carried out in accordance with evaluation criteria specified in Appendix 6 of MCUSA Schedule 5. Details of this are more fully described in Appendix 4 of this report.

#### **3.3 Observations of fourth tender round**

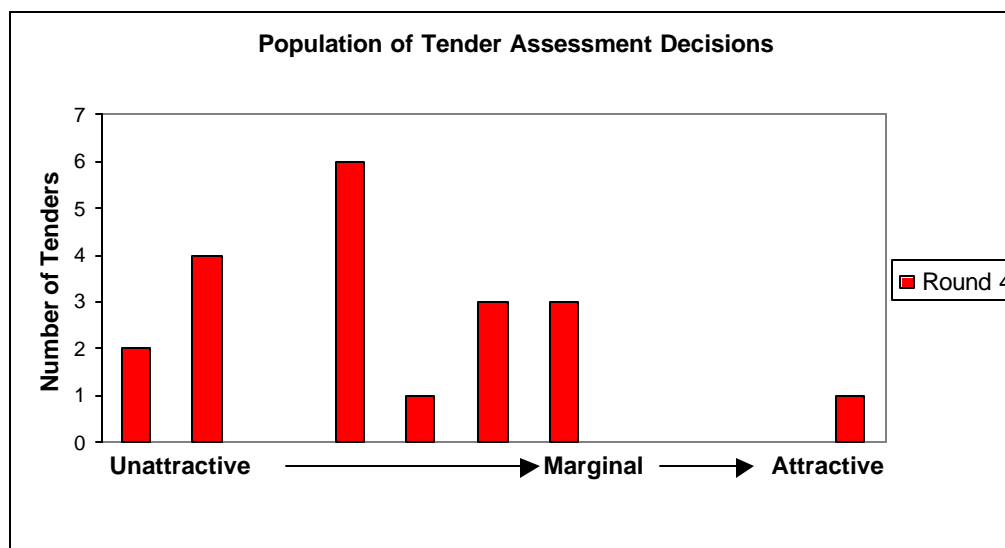
- 3.31 A number of tenders were priced with a 'kinked' price curve for Available Capability across the range of contract breakpoints, hence providing NGC with a clear cost signal as to the tenderers preferred operating range with an associated incentive to maintain the capability. This meant that the market tender had placed a superior incentive upon the generator than that given by the DPM. In a number of the marginal cases, this consideration had the potential to influence the decision whether to accept or reject a market agreement. In cases where capability considerations are material, a genset's previous record of reactive shortfalls may be a factor

considered in tender assessment.

- 3.32 A number of tenders were weighted towards capability, however offered 'flat' Available Capability prices across the full range of breakpoints. Tenders of this type place little incentive on the generator to maintain capability at the outer breakpoints, and are therefore viewed less favourably by NGC.
- 3.33 Many of the tenders had offered a utilisation price less than the default payment arrangement. This enables the optimisation of Mvar despatch, i.e. the re-despatch from more expensive to cheaper sources. The extent to which this is likely to be feasible is considered within the assessment of each tender.
- 3.34 The majority of tenders' utilisation price for the final breakpoint was above that of the DPM. This signals to NGC that the generator would prefer not be despatched in this region of operation. All efforts would be made by the System Operator not to despatch these generators at the outer limits except under fault conditions. Note that little economic penalty accrues to this style of tender.

### 3.4 Assessment Results

- 3.41 Of the 20 tenders evaluated, NGC offered market agreements to 5. All proceeded to contract, representing gensets from 3 stations owned by 2 different Generators and covering 2 fuel types.
- 3.42 In respect of the assessed tenders, the range of assessment outcome is shown in a histogram in Figure 1. As in tender round three most acceptance decisions were extremely marginal reflecting tenderers increasing awareness and knowledge of the reactive market process.



*Figure 1 - Histogram of tender assessment decisions*

3.43 A complete list of eligible Centrally Despatched gensets for 1999/2000 is given in Appendix 1, recording those that have signed market agreements. The remainder comprises those that have either elected to remain on the DPM or whose market tenders were unsuccessful.

### **3.5 Concluding Observations**

3.51 Tender round four is directly comparable with tender round two as both occur mid financial year. It is notable that tenderers appear to be adopting a financial year contracting strategy, with mid-year participation significantly lower than in tender rounds for contracts commencing 1 April.

3.52 The fourth tender round (in comparison with tender round two) has seen an increase in the number of participants seeking remuneration through market agreements. The wide geographic, owner and fuel-type spread is viewed as beneficial to the overall evolution of this newly established market.

3.53 The significant market participation for the fourth tender round may be calculated in percentage terms. The 20 tenders received for contracts commencing 1 October 1999 make up 20% of eligible gensets, of which 25% were successfully assessed and offered market agreements. Of these successful tenders 100% signed reactive market agreements.

3.54 On the whole, submitted tenders appeared to be well structured and informed in this tender round. The message that NGC places value on capability biased tenders appears to have been noted, however it was apparent and surprising that many of the tenders offered a flat Available Capability price, which excluding all other assessment criteria, does not incentivise NGC to accept the tender.

3.55 From 1 April 2000 the DPM will move to a ratio of 100:0 on payments in respect of utilisation:capability. NGC values capability biased tenders which are structured to lower utilisation (/Mvarh) prices. Such tenders will offer greater certainty for both NGC and tenderers.

3.56 All the tenders received were in respect of the obligatory service and some allowed for tender periods greater than the minimum 12 months. NGC welcomes longer-term tenders and those tenders offering the Enhanced Reactive Power Service (ERPS), as they inform NGC=s overall planning process; however the value of such contracts may change from year to year.

## **4 Reactive Payments and Genset Mvarh Utilisation**

4.1 This section details a six-month breakdown of reactive payments and metered genset utilisation for the period April to September 1999, as required by MCUSA Schedule 5.

- 4.2 The table below details total forecast costs due to providers for reactive power services over the period April to September 1999. The terminology is consistent with that contained in NGC=s LC10 statement pertaining to the Transmission Services Use of System charges.

Costs (, m)	Default	Market	Total
Capability	4.0	4.7	8.7
Utilisation	6.7	4.1	10.8
<b>Total</b>	<b>10.7</b>	<b>8.8</b>	<b>19.5</b>

*Table 4.1 - Summary of forecast provisional reactive costs, April - September 1999*

- 4.3 Costs of reactive power represent what NGC will eventually pay, against services delivered in any month. Thus costs represent the total of payments made against that month, plus payments made subsequently, plus disputes and accruals against disputes. No payments have been made for Enhanced Reactive Power Services.
- 4.4 Table 4.2 shows the Mvarh utilisation volumes (lead plus lag) for all eligible despatch units, i.e. providing the Obligatory Reactive Power Service, on a monthly basis. A breakdown by individual genset for the period April to September 1999 is provided in Appendix 3.

Month	Utilisation Volume (Tvarh)		
	Market agreements	Default Payment Mechanism (DPM)	Total = Market agreements + DPM
April-99	1.07	1.15	2.22
May-99	1.04	1.23	2.27
Jun-99	1.01	1.20	2.21
July-99	1.08	1.12	2.20
August-99	1.03	0.99	2.02
September-99	1.24	1.32	2.56
<b>Total</b>	<b>6.47</b>	<b>7.01</b>	<b>13.48</b>

*Table 4.2 - Summary of Generator Reactive utilisation April - September 1999*

- 4.5 Table 4.3 shows six monthly utilisation totals since 1996, sorted by the Seven Year Statement defined zones - North, Midland and South.
- 4.6 The volumes set out here refer to all despatch units eligible for a reactive utilisation payment. Mvarh lag and Mvarh lead are calculated according to the aggregation methodology described

within Appendix 4 of MCUSA Schedule 5 and also within the companion document "Methodology Document for the Aggregation of Reactive Power Metering" by which reactive utilisation payments are made.

	NORTH		MIDLANDS		SOUTH		TOTAL		
	Lead	lag	lead	lag	lead	lag	lead	lag	lead + lag
<b>Apr 96 - Sep 96</b>	2.86	9.79	0.37	1.94	1.49	2.29	4.72	14.02	18.74
<b>Oct 96 - Mar 97</b>	2.72	12.71	0.36	3.07	1.74	2.72	4.82	18.50	23.32
<b>Apr 97 - Sep 97</b>	2.89	8.65	0.41	1.60	1.87	1.77	5.17	12.02	17.19
<b>Oct 97 - Mar 98</b>	2.78	10.67	0.31	3.07	1.54	2.01	4.63	15.75	20.38
<b>Apr 98 - Sep 98</b>	1.96	7.68	0.44	2.02	1.85	1.51	4.25	11.20	15.45
<b>Oct 98 - Mar 99</b>	1.71	9.54	0.36	2.07	1.65	1.66	3.76	13.48	17.24
<b>Apr 99 - Sep 99</b>	1.77	7.25	0.37	1.52	1.27	1.40	3.40	10.20	13.60

*Table 4.3 - Generator reactive utilisation (Tvarh) by region*

## 5 Comparisons of Mid Year Tender Rounds - 2 and 4

- 5.1 The 20 tenders received in the fourth tender round (contracts commencing 1 October 1999) represent an increase over the 10 tenders received in the second round (contracts commencing 1 October 1998). In percentage terms more than 20 % of eligible gensets tendered in round four whereas less than 9% tendered in round two.
- 5.2 From the tendered gensets in round two with contracts ending on 30 September 1999, about half chose to re-tender in the fourth tender round. Of the 5 tenders contracted in round four, 4 were from gensets that were previously contracted in the second tender round.
- 5.3 The tender success rate of tender round four was lower than that of tender round two, i.e. 20% of tenders were assessed successfully in round four compared with 40% tender success in round two. Table 5.1 provides a summary of the four tender rounds to date.
- 5.4 Fifteen tenders in round four were from tenders not proceeding to contract in tender round three, and one genset tendering was new to the process.

Tender Round	Eligible Gensets	Genset tenders received	ORPS	ORPS + ERPS	12 month	>12 months	Successful Gensets offered market agreements	Successful Gensets signing market agreements	% lagging capability with market agreements
1	154	85	76	9	85	0	41	41	~30%
2	113	10	10	0	9	1	5	5	~36%
3	150	102	102	0	102	0	75	57	~40%
4	99	20	20	0	14	6	5	5	~40%

*Table 5.1 - Reactive Market Tender Submission Statistics*

5.5 Therefore, currently and until 31 March 2000 there are a total of 63 gensets on a reactive Market Agreement, i.e. 1 from tender round two, 57 from tender round three and 5 from this, the fourth tender round. As mentioned in Table 5.1 the 63 gensets represent approximately 40% of total available lagging capability.

## **6 Estimates of NGC System Reactive Utilisation April to September 1999**

6.1 NGC is required by MCUSA Schedule 5 to 'use all reasonable endeavours' to provide estimates of the Mvarh absorption and generation by the NGC transmission system for the six-month period ending 30 September 1999.

6.2 This has been approached in two stages:

X The net reactive utilisation (Tvarh) of the NGC system has been derived from the difference between the reactive output of generating units and the reactive demand at Grid Supply Points (GSPs). This is given in Table 6.1 where the accuracy of the data is consistent with the underlying meter readings.

X The net Tvarh described above has been broken down by NGC system component, this is given in Table 6.2. It should be noted that this information is based on estimates and operational records only.

6.3 The simple reactive balance found in Table 6.1 can be described by the equation:

$$|\text{Generation Net Tvarh}| = |\text{Net Reactive Demand at GSPs Tvarh}| - |\text{Net NGC System Tvarh}|$$

For example, for June 1999,  $(-0.56 + 1.65 = 4.95 - 3.86)$ . It is clear from Table 6.1 that the Tvarh contribution from generation is small compared with the other components of the equation.

- 6.4 The generation figures are a national monthly summation of the Settlements figures given in Appendix 3. At this stage, data for September 1999 is provisional and may be subject to amendment. The Tvarh output of embedded centrally despatched gensets is included in these figures.
- 6.5 The >net reactive demands at GSP= figures have been derived from operational records. The figure shown is net, i.e. lagging demand minus leading demand, and in this case is lagging in each month. This figure represents the net effect of the consumer demand plus the LV losses minus the LV gain.

Component (Tvarh)	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	6 monthly Total
Generation Lead	-0.63	-0.64	-0.56	-0.47	-0.61	-0.51	-3.41
Generation Lag	1.59	1.63	1.65	1.73	1.40	2.16	10.16
Net Reactive Demand at GSPs	-5.08	-4.84	-4.95	-5.47	-4.91	-6.05	-31.30
Net NGC System	4.11	3.84	3.86	4.21	4.12	4.40	24.54

*Table 6.1 - Net NGC System Effect*

Note: a positive system utilisation denotes a net system reactive gain (capacitive).

- 6.6 The more detailed breakdown found in Table 6.2 can be described by the following equation:

$$\text{Generation Net Tvarh} = \text{Net Reactive Demand at GSPs} - \text{HV network shunt gain (BV}^2\text{)} + \text{HV network series loss (I}^2\text{X)} + \text{SGT series loss (I}^2\text{X}_t\text{)} - \text{Shunt capacitor gain} - \text{net SVC output} + \text{Shunt reactor loss}$$

- 6.7 The figures in Table 6.2 are estimates and provide an indication of the likely national reactive energy balance within the system.

- 6.8 Points to note when considering Table 6.2 include:

- X HV gain varies due to circuit switching, outages and system operating voltage
- X HV losses are driven by active power flows across the system
- X Supergrid transformer series reactive losses are predominantly driven by REC demand
- X Switching of MSCs and shunt reactors is determined by operational security requirements.

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Component (Tvarh)	Apr-99	May-99	Jun-99	Jul-99	Aug-99	Sep-99	6 month total
<b>MSC</b>	1.40	1.76	1.86	2.05	1.78	2.23	11.09
<b>Shunt Reactor</b>	-1.67	-2.27	-2.08	-1.92	-2.30	-1.65	-11.89
<b>SVC generation</b>	0.09	0.10	0.11	0.14	0.12	0.13	0.69
<b>SVC absorption</b>	-0.09	-0.10	-0.11	-0.09	-0.10	-0.10	-0.59
<b>HV network shunt gain</b>	8.90	8.72	8.53	8.59	8.60	8.66	52.00
<b>HV network series losses</b>	-2.84	-2.81	-2.95	-3.02	-2.52	-3.20	-17.35
<b>SGT series losses</b>	-1.68	-1.55	-1.51	-1.54	-1.46	-1.68	-9.42
<b>Net NGC System Utilisation</b>	4.11	3.84	3.86	4.21	4.12	4.40	24.54
<b>Generation Lead (inc. CD embedded)</b>	-0.63	-0.64	-0.56	-0.47	-0.61	-0.51	-3.41
<b>Generation Lag (inc. CD embedded)</b>	1.59	1.63	1.65	1.73	1.40	2.16	10.16
<b>Net Demand at GSPs</b>	-5.08	-4.84	-4.95	-5.47	-4.91	-6.05	-31.30

*Table 6.2 - Indicative breakdown of Net NGC System Effect*

## **7 Exceptional Reactive Power Service Requirements**

- 7.1 MCUSA Schedule 5, paragraph 7 (Statutory and Regulatory Obligations) enables NGC to contract outside of the Reactive Power Market tender process in specific circumstances for the provision of exceptional reactive power services. NGC are required to publish details of circumstances surrounding this in the preceding six month period.
- 7.2 During the period 01/04/99 to 30/09/99 no 'exceptional' circumstances have arisen, and no exceptional services were acquired by NGC for the provision of voltage support.

## Appendix 1

### Eligible Centrally Despatched Gensets position at 1 October 1999

#### North

	Genset	Contract		Genset	Contract		Genset	Contract
1	BLYTA01Z	DPM	26	DRAXX03Z	DPM	51	HEYM207Z	DPM
2	BLYTA02Z	DPM	27	DRAXX04Z	DPM	52	HEYM208Z	DPM
3	BLYTA03Z	DPM	28	DRAXX05Z	DPM	53	HMAR 01Z	DPM
4	BLYTA04Z	DPM	29	DRAXX06Z	DPM	54	HMAR 02Z	DPM
5	BLYTB07Z	DPM	30	DRAXX09G	DPM	55	HMAR 03Z	DPM
6	BLYTB08Z	DPM	31	DRAXX10G	DPM	56	HMAR 04Z	DPM
7	BRGG 01Z	Market3	32	DRAXX12G	DPM	57	HMAR 05Z	DPM
8	CDCL 01Z	DPM	33	EGGB 01Z	DPM	58	HRTL 01Z	Market3
9	CONQ 01Z	Market3	34	EGGB 02Z	DPM	59	HRTL 02Z	Market3
10	CONQ 02Z	Market3	35	EGGB 03Z	DPM	60	KEAD 01Z	Market3
11	CONQ 03Z	Market3	36	EGGB 04Z	DPM	61	KILLN01Z	DPM
12	CONQ 04Z	Market3	37	FELL 01Z	DPM	62	KILLP01Z	Market3
13	COTT 01Z	Market3	38	FERR 01Z	Market3	63	KILLP02Z	Market3
14	COTT 02Z	Market3	39	FERR 02Z	DPM	64	ROCK 01Z	DPM
15	COTT 03Z	Market3	40	FERR 03Z	Market3	65	ROOS 01Z	DPM
16	COTT 04Z	DPM	41	FFES 01Z	Market3	66	SHBA 01Z	Market4
17	DEEN 01Z	DPM	42	FFES 02Z	Market3	67	SHBA 02Z	Market3
18	DINO 01Z	Market3	43	FFES 03Z	Market3	68	TESI 01Z	DPM
19	DINO 02Z	Market3	44	FFES 04Z	Market3	69	TESI 02Z	DPM
20	DINO 03Z	Market3	45	FIDL 01Z	Market3	70	WYLF 01Z	DPM
21	DINO 04Z	Market3	46	FIDL 02Z	Market3	71	WYLF 02Z	DPM
22	DINO 05Z	Market3	47	FIDL 03Z	Market3	72	WYLF 03Z	DPM
23	DINO 06Z	Market3	48	FIDL 04Z	Market3	73	WYLF 04Z	DPM
24	DRAXX01Z	DPM	49	HEYM101Z	DPM			
25	DRAXX02Z	DPM	50	HEYM102Z	DPM			

#### Midlands

	Genset	Contract		Genset	Contract		Genset	Contract
74	CORB 01Z	DPM	83	PETEM01Z	Market3	92	SIZB 01Z	DPM
75	DERW 01Z	DPM	84	RATS 01Z	Market3	93	SIZB 02Z	DPM
76	DRKW 09Z	DPM	85	RATS 02Z	Market3	94	SIZEA01Z	DPM
77	DRKW 10Z	DPM	86	RATS 03Z	Market3	95	SIZEA02Z	DPM
78	DRKW 12Z	DPM	87	RATS 04Z	DPM	96	SUTB 01Z	DPM
79	IROB 01Z	DPM	88	RUGLB06Z	Market3	97	WEBU 01Z	Market3
80	IROB 02Z	DPM	89	RUGLB07Z	Market3	98	WEBU 02Z	Market3
81	KLYNA01Z	Market3	90	RUGLB06G	DPM	99	WEBU 03Z	Market3
82	LBAR 01Z	Market4	91	RUGLB07G	DPM	100	WEBU 04Z	Market3

#### South

	Genset	Contract		Genset	Contract		Genset	Contract
101	ABTHB07Z	Market4	120	DIDCB06Z	Market3	139	HINPA03Z	DPM
102	ABTHB08Z	Market4	121	DIDC 01G	DPM	140	HINPA04Z	DPM
103	ABTHB09Z	Market4	122	DIDC 02G	DPM	141	HINPA05Z	DPM
104	BARK 02Z	DPM	123	DIDC 03G	DPM	142	HINPA06Z	DPM
105	BARK 11Z	DPM	124	DIDC 04G	DPM	143	KINO 01Z	Market3
106	BARR 01Z	DPM	125	DNGB 21Z	Market3	144	KINO 02Z	Market3
107	BRWE 01Z	Market3	126	DNGB 22Z	Market3	145	KINO 03Z	DPM
108	BRWE 02Z	Market3	127	DUNGA01Z	DPM	146	LITTD01Z	Market2
109	BRWE 03Z	Market3	128	DUNGA02Z	DPM	147	LITTD01G	DPM
110	BRWE 04Z	Market3	129	DUNGA03Z	DPM	148	LITTD02G	DPM
111	BRWE 05Z	Market3	130	DUNGA04Z	DPM	149	MEDP 01Z	DPM
112	BRWE 06Z	Market3	131	FAWL 03Z	DPM	150	OLDS 01Z	Market3
113	COWE 01Z	DPM	132	FAWN 01Z	DPM	151	OLDS 02Z	Market3
114	COWE 02Z	DPM	133	GRAI 01Z	DPM	152	RYEH 01Z	Market3
115	DIDC 01Z	DPM	134	GRAI 04Z	DPM	153	SEAB 01Z	Market3
116	DIDC 02Z	DPM	135	HINB 07Z	DPM	154	TAYL 02Z	DPM
117	DIDC 03Z	DPM	136	HINB 08Z	DPM	155	TAYL 03Z	DPM
118	DIDC 04Z	DPM	137	HINPA01Z	DPM	156	TILBB08Z	DPM
119	DIDCB05Z	Market3	138	HINPA02Z	DPM	157	TILBB09Z	DPM

#### Note :

market 2 refers to those contracts commencing 1 October 1998, market 3 refers to those contracts commencing 1 April 1999 and Market 4 refers to those contracts commencing 1 October 1999. Eligible CD Gensets are those of reactive capability, leading or lagging greater than 15 Mvar at the commercial boundary, and the further stipulations within the MCUSA Schedule 5. There are to date, no market contracts for Enhanced Capability.

## Appendix 2

### Reactive Market Agreement status at 1 October 1999

#### - Contracts continuing on 1 October 1999

(running through to 31 March 2000 with the exception of Littlebrook

- contract expiry date of 30 September 2000)

1	RPG	<b>BRGG 01Z</b>	31	Edison First	<b>FIDL 01Z</b>
2	BNFL - Magnox	<b>BRWE 01Z</b>	32	Edison First	<b>FIDL 02Z</b>
3	BNFL - Magnox	<b>BRWE 02Z</b>	33	Edison First	<b>FIDL 03Z</b>
4	BNFL - Magnox	<b>BRWE 03Z</b>	34	Edison First	<b>FIDL 04Z</b>
5	BNFL - Magnox	<b>BRWE 04Z</b>	35	British Energy	<b>HRTL 01Z</b>
6	BNFL - Magnox	<b>BRWE 05Z</b>	36	British Energy	<b>HRTL 02Z</b>
7	BNFL - Magnox	<b>BRWE 06Z</b>	37	Keadby Generation	<b>KEAD 01Z</b>
8	PowerGen	<b>CONQ 01Z</b>	38	PowerGen	<b>KILLP 01Z</b>
9	PowerGen	<b>CONQ 02Z</b>	39	PowerGen	<b>KILLP 02Z</b>
10	PowerGen	<b>CONQ 03Z</b>	40	PowerGen	<b>KINO 01Z</b>
11	PowerGen	<b>CONQ 04Z</b>	41	PowerGen	<b>KINO 02Z</b>
12	PowerGen	<b>COTT 01Z</b>	42	Anglian Power	<b>KLYNA 01Z</b>
13	PowerGen	<b>COTT 02Z</b>	43	National Power	<b>LITTD01Z</b>
14	PowerGen	<b>COTT 03Z</b>	44	BNFL - Magnox	<b>OLDS 01Z</b>
15	National Power	<b>DIDCB 05Z</b>	45	BNFL - Magnox	<b>OLDS 02Z</b>
16	National Power	<b>DIDCB 06Z</b>	46	Peterborough Power	<b>PETEM 01Z</b>
17	First Hydro	<b>DINO 01Z</b>	47	PowerGen	<b>RATS 01Z</b>
18	First Hydro	<b>DINO 02Z</b>	48	PowerGen	<b>RATS 02Z</b>
19	First Hydro	<b>DINO 03Z</b>	49	PowerGen	<b>RATS 03Z</b>
20	First Hydro	<b>DINO 04Z</b>	50	Eastern Merchant	<b>RUGEB 06Z</b>
21	First Hydro	<b>DINO 05Z</b>	51	Eastern Merchant	<b>RUGEB 07Z</b>
22	First Hydro	<b>DINO 06Z</b>	52	PowerGen	<b>RYEH 01Z</b>
23	British Energy	<b>DNGB 21Z</b>	53	Seabank Power	<b>SEAB 01Z</b>
24	British Energy	<b>DNGB 22Z</b>	54	Humber Power	<b>SHBA 02Z</b>
25	Edison First	<b>FERR 01Z</b>	55	Eastern Merchant	<b>WEBU 01Z</b>
26	Edison First	<b>FERR 03Z</b>	56	Eastern Merchant	<b>WEBU 02Z</b>
27	First Hydro	<b>FFES 01</b>	57	Eastern Merchant	<b>WEBU 03Z</b>
28	First Hydro	<b>FFES 02</b>	58	Eastern Merchant	<b>WEBU 04Z</b>
29	First Hydro	<b>FFES 03</b>			
30	First Hydro	<b>FFES 04</b>			

#### - New contracts commencing on 1 October 1999

59	National Power	<b>ABTHB07Z</b>
60	National Power	<b>ABTHB08Z</b>
61	National Power	<b>ABTHB09Z</b>
62	National Power	<b>LBAR 01Z</b>
63	Humber Power	<b>SHBA 01Z</b>

### **Appendix 3**

#### **Reactive Power Generation Utilisation Volumes by Genset April to September 1999**

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
ABTHB07Z	Market	1470	3326	1398	5643	0	0	756	5995	1602	5425	1381	10332	6606	30721
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABTHB08Z	Market	487	4535	212	2467	957	7399	820	7887	790	1941	0	0	3267	24230
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABTHB09Z	Market	11	2449	691	8570	750	7536	0	0	799	5000	1271	17416	3521	40971
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AESB_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	117	248	0	0
BARK_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	22779	8644	24363	15241	25957	14278	21604	20143	20671	12722	18857	27656	134231	98684
BARK_11Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	14972	4217	19881	13468	20982	12374	20671	17574	22711	14906	17588	24674	116805	87212
BLYTA01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLYTA02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLYTA03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLYTA04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLYTB07Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	3	0	102	0	237	0	343
BLYTB08Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	6	10	121	1	225	11	352
BRGG_01Z	Market	70	7720	343	6939	1386	3719	1767	3595	6842	1546	13150	25	23557	23544
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_01Z	Market	144	1073	0	0	0	0	0	0	76	44	0	0	219	1117
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_02Z	Market	706	734	0	0	0	0	0	0	0	0	0	0	706	734
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_03Z	Market	761	676	0	0	0	0	0	0	0	0	0	0	761	676
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_04Z	Market	766	1210	0	0	0	0	90	289	483	976	0	0	1338	2475

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_05Z	Market	581	1404	0	0	0	0	81	406	174	600	0	0	836	2411
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRWE_06Z	Market	536	2298	0	0	0	0	3	372	463	1045	0	0	1002	3715
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONQ_01Z	Market	7475	15183	5968	15096	5352	24107	2156	29999	8015	19165	1216	17847	30182	121397
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONQ_02Z	Market	3176	3843	5194	11503	6597	23297	1876	28721	8051	18133	8163	26834	33057	112331
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONQ_03Z	Market	8049	15559	6957	14639	1621	9583	1428	8832	8705	16503	6081	30176	32842	95291
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONQ_04Z	Market	4930	13779	7547	14855	6414	22698	2042	28564	7674	18676	6807	28355	35413	126926
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CORB_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2156	14211	71	2967	3540	2142	2411	12774	2634	8340	2575	15573	13387	56006
COTT_01Z	Market	1634	13703	2039	15861	1245	12152	1556	13255	4266	6963	729	24855	11469	86789
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COTT_02Z	Market	0	0	0	0	1746	15619	5710	9743	9755	9885	2071	35800	19283	71047
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COTT_03Z	Market	9621	13711	11218	17033	2130	9584	2487	6797	8670	8276	2853	17612	36980	73014
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COTT_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1031	11101	1636	7059	942	8071	1197	4135	438	1197	1926	18121	7170	49683
COWE_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	10	0	17	0	25	0	32	0	0	0	1	1	84
COWE_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	31	0	56	0	42	0	177	0	0	0	15	0	322
DEEN_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	11056	18495	11994	15360	9657	5652	6136	11998	9042	5035	0	0	47884	56539
DERW_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2165	4785	2632	4829	6493	1854	4106	3848	2273	3435	2751	3938	20420	22688
DIDC_01G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	2	0	0	0	2	0	0	0	3	0	7

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
DIDC_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	101	2530	634	2088	745	4487	442	11838	1048	229	1593	7414	4563	28586
DIDC_02G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	11	0	8	0	0	0	17	0	36
DIDC_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIDC_03G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIDC_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	572	9939	139	2572	251	6935	0	0	0	0	194	538	1155	19984
DIDC_04G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	5	0	18	0	0	0	0	0	23
DIDC_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	5363	9156	1648	8285	822	3612	956	9640	361	493	1586	11897	10736	43084
DIDCB05Z	Market	20593	18701	14238	15274	19192	20792	22298	22106	16180	11240	0	0	92501	88112
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIDCB06Z	Market	11665	5340	14448	17835	17655	18243	20289	22944	16241	13682	17078	26710	97377	104754
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_01Z	Market	6814	2192	6315	4868	6583	2810	5173	3832	2237	142	2373	195	29494	14039
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_02Z	Market	5809	866	3666	4289	3362	6293	3906	4890	2562	1430	3787	1044	23091	18812
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_03Z	Market	2982	1257	2820	1017	2774	1933	2656	2630	4022	2170	5921	1948	21174	10955
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_04Z	Market	5439	4294	2050	2653	4684	5048	2378	10845	4943	7295	5581	2396	25075	32531
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_05Z	Market	2747	1391	3860	8667	3231	7683	2775	3187	6427	2575	10391	1655	29430	25158
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DINO_06Z	Market	4705	1744	1292	993	0	0	1746	204	4209	4349	9376	2601	21329	9891
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DNGB_21Z	Market	5712	16757	2238	5137	11796	7476	8985	8345	10508	11518	1269	2792	40508	52025
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DNGB_22Z	Market	12359	6972	11930	13508	10299	2617	6456	8532	14991	12395	6214	7580	62249	51605

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DRAXX01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	3754	28650	3904	16475	1377	48133	5204	50558	3675	36655	2042	62285	19956	242756
DRAXX02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	6847	38315	7871	38115	4673	53327	1833	11673	2814	9650	2686	56812	26723	207892
DRAXX03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	9170	37103	12054	38110	1187	50947	449	12881	0	0	4516	61283	27377	200326
DRAXX04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	86	988	0	0	1872	2134	158	8396	7999	34413	5758	63338	15872	109270
DRAXX05Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	7886	50115	5761	53575	1809	66460	5805	53094	3796	44119	3401	65864	28458	333228
DRAXX06Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	10361	45741	9773	54682	3785	45419	2070	11099	12066	35821	4185	63501	42239	256264
DRAXX09G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	23	0	9	0	5	0	0	0	0	0	36
DRAXX10G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DRAXX12G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DRKW_09Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1077	8671	1978	5690	1478	9193	2913	7953	422	207	1852	4211	9721	35926
DRKW_10Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2573	7299	2336	7680	2612	6696	34	1525	0	0	0	0	7554	23199
DRKW_12Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1139	3900	689	12103	0	0	0	0	0	0	629	632	2457	16634
DUNGA01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	546	3060	1095	2925	3208	1676	2473	2203	1449	2296	641	4641	9412	16802
DUNGA02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1057	3826	390	4465	1685	3642	695	4333	492	4400	303	6602	4623	27267
DUNGA03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	614	1346	260	210	2958	1426	1508	2387	2483	915	1544	3165	9367	9449
DUNGA04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1412	386	482	295	5164	805	3564	860	5585	178	2931	1189	19139	3711

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
EGGB_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2760	10806	1792	3375	893	9651	3389	13053	3175	12367	3372	23185	15381	72437
EGGB_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	778	5763	446	8789	64	2709	0	0	0	0	1288	17260
EGGB_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	6494	11079	2029	8147	0	0	0	0	1471	8266	4179	17518	14174	45011
EGGB_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2662	26548	1450	29183	1039	30087	753	26103	595	13165	0	0	6500	125085
FAWL_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	18	163	0	84	25	7	392	637	254	173	515	1098	1204	2160
FELL_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	551	2216	736	1989	17	3477	1570	1070	428	2405	2270	2575	5572	13731
FERR_01Z	Market	2126	5891	2435	22311	1739	11590	2364	18832	7520	26806	2454	31696	18638	117125
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FERR_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1311	7180	409	7559	432	6782	0	0	0	0	0	0	2152	21521
FERR_03Z	Market	3066	21821	346	2757	1261	23696	3376	35743	2670	22354	3348	44169	14067	150541
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FERR_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	753	2476	0	0	753	2476
FFES_01Z	Market	1118	85	759	315	621	1213	134	850	76	704	182	824	2891	3991
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFES_02Z	Market	215	49	287	111	527	437	777	391	561	408	641	408	3007	1804
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFES_03Z	Market	825	406	870	179	308	302	1111	496	1350	391	1443	519	5906	2292
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFES_04Z	Market	1055	450	1434	571	1337	444	812	702	672	989	1176	422	6486	3577
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIDL_01Z	Market	8271	1351	4662	2435	3952	5314	3131	3886	0	0	0	0	20016	12985
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIDL_02Z	Market	14637	941	11026	1702	2035	2020	0	0	7426	1387	7838	3828	42961	9878
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIDL_03Z	Market	0	0	0	0	0	0	796	1038	12783	1092	6944	3891	20523	6022

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIDL_04Z	Market	39443	146	25047	379	23537	382	13011	1260	0	0	3193	631	104231	2798
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAI_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	14	194	1	276	0	0	41	796	21	390	604	1913	681	3569
GRAI_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAI_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	155	329	742	3384	897	3713
HEYM101Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2476	72665	2144	76167	5757	47666	3999	53151	5625	35209	1742	86764	21743	371622
HEYM102Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	877	9531	5983	52975	2588	30186	9756	46405	1757	85819	20961	224916
HEYM207Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1020	74403	1732	68795	4504	51725	3986	68786	6623	48355	1113	22038	18977	334102
HEYM208Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1268	74994	2739	72479	2476	20140	1970	31766	0	0	0	0	8452	199380
HINB_07Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	26921	5760	30963	2550	22491	3987	9762	946	34953	9830	28883	9460	153974	32534
HINB_08Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	25549	6148	30518	5249	24726	9716	44640	10599	10269	1128	0	0	135702	32841
HINPA01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	912	622	0	0	0	0	0	0	0	0	0	0	912	622
HINPA02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2305	104	0	0	0	0	0	0	0	0	0	0	2305	104
HINPA03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1094	338	0	0	0	0	0	0	0	0	0	0	1094	338
HINPA04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	193	549	0	0	0	0	0	0	0	0	439	152	631	701
HINPA05Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	613	235	0	0	0	0	0	0	0	0	531	147	1144	382
HINPA06Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
HMAR_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	961	1300	732	1155	847	1299	3456	611	2931	299	3870	408	12797	5072
HMAR_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	684	1010	379	755	448	2415	227	3658	744	1230	290	3838	2772	12907
HMAR_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	384	1996	295	1421	299	5900	300	5712	417	2578	268	3487	1963	21094
HMAR_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	689	782	731	614	235	186	1258	1118	2449	415	2800	305	8162	3420
HMAR_05Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	130	2686	259	375	0	0	0	0	850	588	683	1339	1922	4989
HRTL_01Z	Market	207	83728	592	40210	670	63943	260	98984	353	92705	0	137639	2082	517209
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HRTL_02Z	Market	1461	50827	691	49047	292	45867	1037	24869	10506	45835	57917	88	71904	216533
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IROB_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2104	8181	1752	10990	799	5415	1777	13258	2892	7468	2304	6425	11627	51738
IROB_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2042	8159	0	0	0	0	0	0	1699	6624	1896	8318	5636	23100
KEAD_01Z	Market	5939	20384	13974	19457	4269	23623	5144	26604	7714	19554	1707	36789	38747	146411
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KILLN01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2637	13419	1977	28359	4759	35512	2512	37304	7276	33304	2011	47751	21173	195649
KILLP01Z	Market	191	50206	1790	39999	2277	36634	1828	37677	2330	26681	0	0	8416	191197
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KILLP02Z	Market	1063	45541	821	31017	1825	34574	1845	35235	2955	29496	1467	45271	9977	221133
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KINO_01Z	Market	22656	529	5499	260	6070	2735	11291	1767	11007	1160	25637	512	82159	6963
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KINO_02Z	Market	5720	3943	7447	7631	304	1389	3689	9742	6081	6485	5950	16421	29191	45612
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KINO_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	7316	5354	4456	10160	3407	9295	3820	14635	994	4054	0	0	19993	43498
KINO_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KLYNA01Z	Market	5855	15958	6815	15305	104	1503	0	0	1969	2465	7406	15150	22149	50381
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LBAR_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	5302	29138	7112	28922	6137	23525	7669	36545	7248	26468	6489	41102	39956	185700
LITTD01G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	7	0	3	0	0	0	0	0	10	0
LITTD01Z	Market	11	110	0	0	29	65	33	2423	24	916	700	4231	798	7745
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LITTD02G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	1	0	5	0	3	0	4	0	1	0	0	0	14	0
LITTD03G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEDP_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	23298	8482	19743	12592	24136	11688	20512	17808	21228	9892	9765	21212	118683	81674
OLDS_01Z	Market	2437	19334	1514	22169	2574	33709	2879	27077	2196	23340	3019	12448	14620	138077
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OLDS_02Z	Market	2790	22160	4041	17094	2011	7655	1796	6084	2198	10940	2489	10972	15325	74905
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PETEM01Z	Market	7495	12399	8535	10961	9158	15793	6210	15512	3129	6843	0	0	34528	61508
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RATS_01Z	Market	4124	19827	4118	29317	6053	17520	4385	23865	4382	9018	4217	17643	27279	117190
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RATS_02Z	Market	1969	25650	776	22708	604	11732	492	13579	1079	15655	4789	21202	9709	110525
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RATS_03Z	Market	0	0	224	8112	1548	26076	1221	29664	1502	29069	4336	38471	8830	131392
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RATS_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	823	19818	445	13462	113	2299	0	319	0	0	0	0	1380	35898
ROCK_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	31567	7683	22815	5575	20612	17222	11070	27446	17854	15525	10120	30370	114038	103820
ROOS_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	276	3126	656	2050	323	2168	1442	2949	94	7279	46	5025	2837	22597

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
RUGLB06G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	59	0	7	0	11	4	2	0	43	0	0	4	122
RUGLB06Z	Market	5072	21615	6266	16538	3058	15834	3846	19300	4	7	1921	19400	20166	92695
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RUGLB07G	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	10	60	0	7	0	17	0	27	0	4	0	2	10	117
RUGLB07Z	Market	3394	22314	4399	24568	2451	15907	2390	17483	4801	19397	1047	20197	18481	119865
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RYEH_01Z	Market	19868	20593	18477	23657	24915	27230	12076	27865	16822	22194	15044	34303	107203	155842
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEAB_01Z	Market	0	0	0	0	336	167	8137	6537	11025	8412	7237	15856	26735	30972
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHBA_01Z	Market	6813	12672	9772	11421	5778	7154	4128	23764	5125	17821	5316	10504	36932	83335
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHBA_02Z	Market	5585	11511	5874	9545	7938	14425	2232	23134	3340	17633	1917	9012	26885	85259
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIZB_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	8372	13742	10795	22098	6694	26850	7549	22828	3962	40085	37371	125604
SIZB_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	10672	17746	10110	23343	6685	27719	6835	21867	5637	26497	39940	117172
SIZEA01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	3660	14204	3806	10626	3210	10907	2015	11524	1712	8171	2279	9770	16681	65202
SIZEA02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	3552	14237	2506	9945	2361	7626	2186	10672	2208	7788	1295	7609	14108	57877
SUTB_01Z	Market	na	na	na	na	na	na	na	na	0	0	0	0	0	0
	DPM	na	na	na	na	na	na	na	na	0	0	7027	22062	7027	22062
TAYL_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	3	52	0	17	0	4	0	92	0	1	0	0	3	166
TAYL_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	25	0	12	0	1	0	27	0	2	0	1	0	67
TESI_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	2412	28924	6335	42506	1480	46876	3506	47697	3666	33149	187	68995	17586	268146
TESI_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Genset	Agreement	Monthly Mvarh												6 Monthly Totals (Mvarh)	
		Apr-99		May-99		Jun-99		Jul-99		Aug-99		Sept-99			
		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
	DPM	1929	33554	7163	35794	3594	34488	5765	37587	6400	26575	1049	65865	25901	233863
TILBB08Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	5823	5196	4949	8483	84	640	770	4208	2001	5700	1324	16200	14951	40426
TILBB09Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	4074	3434	197	1715	904	5774	809	14169	1842	5537	260	14257	8087	44885
WEBU_01Z	Market	1481	24940	1079	30417	424	26908	145	11829	1137	33209	469	32561	4735	159864
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEBU_02Z	Market	2101	31348	2533	47087	240	23910	0	0	0	0	1276	23346	6150	125691
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEBU_03Z	Market	2402	34815	1829	47623	506	46148	1396	51449	1037	42535	689	50608	7860	273178
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEBU_04Z	Market	1392	28490	924	33950	1616	29793	1630	49581	1556	33815	540	38039	7658	213668
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WILLB06Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WYLF_01Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	0	0	0	0	1131	0	1146	23	15201	627	8834	1944	26312	2594
WYLF_02Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	15071	323	31194	8	20596	1447	768	83	0	0	7852	2584	75481	4444
WYLF_03Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	22209	12	36849	8	32424	52	17816	1144	16580	175	13894	1438	139773	2829
WYLF_04Z	Market	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DPM	7510	2233	17201	648	10262	3975	7004	7764	20373	1502	4089	5739	66439	21861
Sub Total	Market	300020	770748	259281	775699	228138	784278	201036	879191	284015	750291	288020	953223	1560511	4913431
Sub Total	DPM	327342	819971	376360	855132	329064	868538	266604	849915	325092	645424	222054	1210759	1846516	5249738
Total	Mvarh	627362	1590719	635641	1630831	557202	1652816	467640	1729106	609107	1395715	510074	2163982	3407027	1016316 9

## Appendix 4

### Tender Assessment Procedure

#### A4.1 Introduction

A4.11 NGC assessed the fourth Reactive Power Market tender round using a similar process as that which applied to the first, second and third tender rounds. Analytical processing was conducted in six-monthly segments in order to consider any interaction with the overlap of contracts secured during the second Reactive Power Market tender round.

A4.12 NGC divided the process of assessing tenders into several stages, which were addressed as follows:

- X *Tender Receipt and Registration*: The tenders were opened, in the presence of a separate witness and all tender data was transcribed into TARDIS (Transmission Ancillary Reactive Database Information System).
- X *Tender Data validation*: All database entries were then separately checked back to the original tender sheets. TARDIS compliance checks showed that all tenders submitted were indeed compliant.
- X *Obligatory Reactive Power Service Assessment*. The tenders were assessed against likely outgoings, taking into account the many interacting factors associated with each tender acceptance decision, as described in MCUSA Schedule 5, Appendix 6. This involved, inter-alia, evaluation against projections of expenditure and availability of service against historic and forecast Mvar and Mvarh data to produce central views of the money payable under the DPM or a market agreement (described below). The overall assessment was supported by an examination of many credible sensitivities around the central view.
- X *Enhanced Reactive Power Service Assessment*. Had NGC received any ERPS tenders these would have been considered on a case-by-case basis against possible alternatives, such as transmission constraints or NGC investment.

#### A4.2 Core Analytical processing

A4.21 Tender assessment takes place in the context of uncertainties and interactions affecting reactive uplift payments and transmission requirements. To initiate the assessment of the overall value of each tender, it is considered necessary to construct a central view of future payments so that the relative impact of the factors influencing the economic evaluation of tenders can be fully addressed.

A4.22 For each genset tendered for 2000/01, the processing was as follows:

- X Forecast Mvarh generated, in each band by reactive Mvar breakpoints, were set via extrapolations from historic observations and forecast load factors. The historic observations covered representative days over 1997 and 1998, and came from the Ancillary Services records against which reactive power utilisation is currently being paid.
- X The default utilisation money was set at forecast Mvarh multiplied by assumed final utilisation price of 1.29 /Mvarh nationally.
- X Market agreement capability money was set at tendered price multiplied by tendered capability, allowing for break-points, multiplied by forecast hours both available and synchronised.
- X Market agreement utilisation money was set at tendered prices, multiplied by the above forecast Mvarh, respecting the tendered break-point bands of Mvarh utilisation.

A4.23 The core comparison of default versus market agreement is based on the forecast payments detailed above. Reactive power assessment is however, by no means as simple as taking the cheapest option. A full understanding of the factors influencing reactive power requirements on the NGC Transmission System must be taken into account to provide a complete economic assessment of tender value.

### **A4.3 Assessment Sensitivities**

A4.31 The principal role of tender assessment is to quantify and evaluate consistently the many factors that NGC and the Reactive Power Market Working Group (RPMWG) have agreed should be considered. These factors are those referred to in 5.3(e)(ii) of MCUSA Schedule 5 and are cross-referenced in section 2.12 of the Invitation to Tender pack. The NGC evaluation team has developed and implemented a process enabling these factors and associated uncertainties to be methodically considered.

A4.32 The RPMWG accepted at the outset of the reactive market that aspects of the tender evaluation process would be subjective in nature. It was therefore important to establish a framework within which this subjectivity could be exercised in a consistent fashion across all tenders.

A4.33 Specific questions were asked of each tender, examples of which follow:

- X *Would a Market Agreement (central case assessment) give a reduction in payments?*
- X *Would a Market Agreement be robust against:*
  - < *expected individual variations in utilisation due to:*
    - \* *a new station opening nearby*
    - \* *an existing nearby station closing*
    - \* *trends in local reactive power demand*

- X *Would a Market Agreement enhance the incentive on the Generator to maintain his Grid Code capability?*
- X *How would a Market Agreement affect operational despatch?*
- X *To what extent might a Market Agreement potentially offset NGC investment?*
- X *Would a Market Agreement for ORPS enable a desired contract for ERPS?*

A4.34 All other criteria in MCUSA Schedule 5 paragraph 5.3 are covered by this methodology.

A4.35 In all cases, NGC continued to consider interaction with forecast transmission constraints. In no cases was significant interaction with constraints identified.

A4.36 In all cases, NGC considered possible interaction with NGC planned investments. The commissioning in 2000/01 of new NGC transmission equipment, which includes some reactive compensation equipment, influenced NGC's view of forecast Mvarh. All of the commissioning equipment is required for compliance with Transmission Licence Standards, and re-phasing of planned NGC investments within a 12-month contract period is not a practical option.

## **Appendix 5**

### **Contact Numbers**

A5.1 Comments, suggestions and enquiries can be directed to National Grid's **Reactive Market Helpline** on:

**01203 423039**

A5.2 Further report information may be obtained by contacting:

**Mr. Robert Rome  
Transmission Services  
National Grid House  
Kirby Corner Road  
Coventry CV4 8JY**

A5.3 For any other information please feel free to look up the NGC website on the following address:

**[www.ngc.co.uk](http://www.ngc.co.uk)**