Review of Electricity Market Information

Changes to OC1/OC2 and NGC's Internal Processes Effective from 11 October 2004

1 Introduction

In January 2004, NGC carried out a review of the operational information that it receives and disseminates to the market. The review identified a number of improvements to the existing processes which ranged from NGC's internal calculation methodologies, through data flows between NGC and Users, to the publication of information.

NGC's proposals were presented to the Grid Code Review Panel and, after industry consultation on possible Grid Code changes, were submitted to Ofgem in August 2004[1]. Ofgem has directed implementation of these proposals, effective from 11 October 2004.

This document describes the changes that are coming into effect on 11 October 2004, and covers changes to both Grid Code and NGC's internal processes.

2 Changes to Existing Processes

The changes to existing processes, effective from 11 October 2004, consist of:

- Revised methodology for calculation of OPMR (Operational Planning Margin Requirement);
- Publication of 'day ahead' and 'after the day' information;
- Removal of Breakdown Allowance and Station Transformer Demand from Output Usable submissions;
- Inclusion of Station Transformer Demand in demand forecasts.

2.1 OPMR Methodology

2.1.1 Historical Calculation

The OPMR has historically been based on an annualised 1-in-365 probability that the demand could exceed available generation. The OPMR methodology has analysed distributions of historical demand and generation data to determine the margin requirements.

[1] Consultation Paper G/04 'Proposed changes to OC1 and OC2'.

This statistically derived value of OPMR has varied from week to week but has not been specific to the day of the week. Furthermore, the margin requirement depicted by OPMR has not been reflective of short term reserve requirements that NGC seeks to hold.

2.1.2 Revised Methodology

The revised methodology determines an OPMR which is reflective of short term reserve requirements and is specific to the day of the week (e.g. different values for Monday, Tuesday – Friday, Saturday, and Sunday). The revised OPMR is therefore reflective of the volume of reserve that the control room will be looking to hold, and provides improved transparency to the market and greater certainty in the determination of 'surplus'. This should provide greater clarity to the market in advance if, for example, the margins are low and a NISM (Notice of Insufficient Margin) is likely to be issued by NGC.

Compared with the historical position, the revised methodology is likely to result in a reduced OPMR for the winter months and increased OPMR for the summer months.

Further details of the revised methodology can be found in Appendix 1.

2.2 Publication of 'Day Ahead' and 'After the Day' Information

From 11 October 2004, NGC 's Reserve requirements are to be published at the day ahead stage and post-event reserve information is to be published on the following day.

At the 'day ahead' stage, NGC will publish two types of Reserve requirement, which are the Scheduled Reserve Requirement (SRR) and the Residual Reserve Requirement (RRR). SRR is a proportion of Short Term Operating Reserve Requirement (STORR) that is not already contracted ex-ante and hence must be secured 'on the day'. It consists of two elements i.e. the surplus that is available in the Balancing Mechanism and the remaining reserve that is yet to be procured. The remaining reserve is the RRR which must be procured by additional balancing actions.

On the following day, NGC will publish two sets of information pertinent to the previous day. The information will consist of SRR at the Final Planning Stage and volumetric data associated with the reserve actions (e.g. volume of warming actions).

Publication of the above 'day ahead' and 'after the day' information should provide a better indication of NGC's future requirements and hence better opportunities for the market to provide additional reserve.

Further details of the information to be published on the 'day ahead' and 'after the day' can be found in Appendix 2.

2.3 Removal of Breakdown Allowance and Station Transformer Demand from OU Submissions

2.3.1 Historical Treatment

The Output Usable (OU) data provided by Generators has previously accounted for Breakdown and Station Transformer Demand differently across different timescales, as defined in the Grid Code. For 2-49 days ahead of real time, the OU submission have not included allowances for Breakdown and Station Transformer Demand whereas such allowances have been made by Generators for timescales 8 weeks – 5 years ahead of real time (for shorter time scales, NGC has included these allowances). This inconsistency has caused uncertainty in the level of OU and OU-based information provided to the market.

2.3.2 Revised Treatment

From 11 October 2004, the OU submissions for 8 weeks – 5 years ahead of real time will not include allowances for Breakdown and Station Transformer Demand. This is consistent with OU submissions for 2-49 days ahead of real time which already exclude such allowances. This means that, from 11 October 2004, all OU submissions across all timescales will be free of allowances for both Breakdown and Station Transformer Demand.

Further details of the revised treatment of Breakdown and Station Transformer Demand can be found in Appendix_3.

2.4 Inclusion of Station Transformer Demand in demand forecasts

2.4.1 Historical Treatment

As explained in section 2.3, the Station Transformer Demand has previously been accounted for on the 'generation side'. For longer timescales (8 weeks to 5 years ahead of real time), this demand has been estimated by Generators in their OU submissions and, for shorter timescales (2-49 days ahead of real time), it has been estimated by NGC and removed from the overall OU figures.

2.4.2 Revised Treatment

From 11 October 2004, the Station Transformer Demand will no longer be accounted for on the 'generation side', and will instead be taken into account by NGC on the 'demand side'. NGC considers a range of factors in conducting its demand forecasts as specified in Grid Code, and this range will now include the Station Transformer Demand.

Further details of the revised treatment of Station Transformer Demand on the 'demand side' can be found in Appendix 3.

3 Overall Impact of Changes on Published Data

3.1 BMRS Published Data

The changes described in section 2 affect the data displayed on two screens on the BMRS website. The relevant page on the website can be accessed using the link http://www.bmreports.com/bwx_reporting.htm and the relevant screens can be identified under the ***National Data*** and ***Forecast***. Under the ***Forecast***, the data that is affected by the changes corresponds to the ***2-14 Day Ahead*** and ***2-52 Week Ahead*** timescales.

3.1.1 2-14 Day Ahead

The screen corresponding to this timescale shows two sets of data, namely, National Demand Forecast Day (NDFD) and daily Surplus (SPLD).

NDFD will increase by an amount equivalent to the Station Transformer Demand which will now be added to the demand forecast. However, SPLD (the difference between OU and forecast demand) will remain unchanged because the increase in OU as a result of removal of Station Transformer Demand will be counter-balanced by an equivalent increase in forecast demand.

There is no change to the treatment of Breakdown Allowance in this timescale.

3.1.2 2-52 Week Ahead

The screen corresponding to this timescale also shows two sets of data i.e. National Demand Forecast Week (NDFW) and weekly Surplus (SPLW).

NDFW will increase by an amount equivalent to the Station Transformer Demand.

For the 2-7 week period, SPLW will remain unchanged. However, for the period 8-52 weeks, SPLW may be different depending on the relative Breakdown Allowances made previously by Generators and now by NGC.

3.2 Elexon Published Data

The changes described in section 2 also affect the data displayed on the Elexon screens. The relevant page on the Elexon website can be accessed using the link http://www.elexon.co.uk/marketdata/PhysicalData/default.aspx, which leads to ***Output Usable Data*** and ***Generating Plant Demand Margin***.

3.2.1 Output Usable Data

This screen allows access to OU data (Microsoft Excel files) at both National and Zonal levels, for a range of timescales and dates. The timescales consist of 2-14 Days Ahead, 2-49 Days Ahead, 2-52 Weeks Ahead, 1 Year Ahead, 2 Years Ahead, 3 Years Ahead, 4 Years Ahead, and 5 Years Ahead.

The removal of Station Transformer Demand from OU will impact the OU data corresponding to all timescales; OU will increase by an amount equivalent to the Station Transformer Demand.

For shorter timescales (up to 7 weeks ahead), the Breakdown Allowance will continue to be treated in the same way as previously, and hence the OU data corresponding to shorter timescales will not be impacted by the Breakdown Allowance. However, for longer timescales (from 8 weeks ahead to 5 years ahead), the OU data may be different depending on the relative Breakdown Allowances made previously by Generators and now by NGC.

3.2.2 Generating Plant Demand Margin.

This screen allows access to Margin data (Microsoft Excel files) for 2-14 Days Ahead and 2-52 Weeks Ahead timescales.

The Margin (the difference between OU and forecast demand) corresponding to the timescale 2-14 Days Ahead and the period 2-7 Weeks Ahead will remain unchanged. However, for the period 8-52 Weeks Ahead, the Margin data may be different depending on the relative Breakdown Allowances made previously by Generators and now by NGC.

4 Conclusions

NGC's review of electricity market information, and subsequent proposals which have been approved by Ofgem, has resulted in key changes to the processes associated with the calculation of OPMR, publication of 'day ahead' and 'after the day' information, and OU submissions. NGC believes that these changes, effective from 11 October 2004, will improve clarity of market information and hence provide better signals to the market. This will help both the industry and NGC to make more informed decisions; the Users could improve their self-balancing ahead of the Gate Closure and, in turn, NGC will be able to better perform its residual balancing role.

Appendix 1
Revised OPMR Methodology

1 Background

In line with other changes relating to the publication of Grid Code data under OC1 and OC2, NGC is modifying the Operational Planning Margin Requirement [OPMR] as used in the calculation of Margin surplus published data.

The OPMR is calculated by NGC to indicate, through published Margin surplus data, the future level of additional plant required, above demand forecast, that is used by the market, NGC and other stakeholders to give an indication as to whether generator OC2 data is indicating there is adequate plant available.

The aim of the modifications to OPMR is to make the Margin surplus figure more consistent, or stable, week-on-week allowing market participants greater clarity of the effect of plant availability changes on any surplus. In addition, the changes increase the coupling between OPMR and the Day ahead Operating Margin Requirement. This means that a shortfall anticipated by the Margin surplus data should be more likely to translate into additional balancing actions and the issuance of on-the-day System Warning messages by NGC.

2 New OPMR

The calculation for OPMR is to be revised to deliver a more stable figure that closely reflects NGC's Reserve Requirements. This figure should, through the Margin surplus data, also allow the market to decide whether the resulting indicated plant surplus, related to NGC reserve requirements, provides them with an adequate level of surplus plant to manage demand and imbalance risk.

The introduction of the new figure is also timed to align with the removal of plant break down allowance (see Appendix 3), to facilitate further clarity in the Margin surplus data.

The new short-term OPMR figures will therefore directly reflect the NGC Day Ahead Operating Margin Requirements. The figure will be adjusted, but only so the figure represents that level of the Operating Margin Requirement that is expected to be delivered by generator declarations under OC2. For example, OPMR will be discounted to reflect the level of Non-BM contracted Standing Reserve and also to reflect levels of contracted response services.

3 How often will OPMR change?

The new OPMR figure should only change when NGC changes its Reserve Requirements, typically on a seasonal basis. However, NGC Reserve Requirements within a season vary for different days of the week. Currently different Reserve Requirements are calculated for Monday, Tuesday - Friday, Saturdays and Sundays. The same variations will be reflected through into the new OPMR levels. Reserve Requirements will typically be calculated 3-4 months ahead and therefore OPMR may alter at similar lead times. Only smaller changes to Reserve Requirements are likely to occur closer to real time, to reflect changes in system conditions such as

transmission constraints or special events. These will then feed into OPMR as appropriate.

4 As a result of new OPMR, will a shortfall in availability in Margin surplus figures mean a NISM will be issued?

As discussed above, this methodology should create a more consistent Margin surplus figure that is closely coupled to NGC's Reserve Requirements and shortfalls or surpluses against those requirements. The number should also, therefore, mean that surplus be more closely linked to the issuance of system warnings, i.e. NISMs and HRDRs. There are several reasons why this may not occur, for example, because of significant changes in generator availability or demand forecast. Overall, however, the indication of a shortfall should mean a greater chance of on-the-day NGC System Warnings, additional balancing actions and, as a result, increased risk of higher imbalance prices.

5 How does the number compare to previous OPMR levels?

The Tables 1 & 2, below, give some illustrative figures for the two OPMRs based on data from winter 2003/04. The numbers are broadly aligned but it should be remembered that new OPMR will be more stable through the weeks as a result of the new figure and other associated changes to OC1 and OC2 relating to Breakdown allowance and Station Load.

It should be noted that the new figures reflect the full range of modifications to OC2 data, including the removal of breakdown allowance and station load, where appropriate, from the OPMR.

Table 1 - Weekly data

Weekly Data	Old OPMR (Average)	Illlustrative new OPMR
Winter	7,212	5,070
Summer	6,111	5,200

Table 2 - Daily data

Month	Day	Old OPMR	New OPMR
January	Monday	6,752	4,770
	Tuesday	6,762	5,070
	Wednesday	5,993	5,070
	Thursday	5,990	5,070
	Friday	6,000	5,070
	Saturday	6,080	4,350
	Sunday	6,090	5,050
August	Monday	5,844	5,400
	Tuesday	5,723	5,200
	Wednesday	5,937	5,200
	Thursday	5,947	5,200
	Friday	5,955	5,200
	Saturday	6,001	5,600
	Sunday	6,008	5,600

6 Summary

The aim of new OPMR is to provide clear, stable Margin surplus figures that allow market participants to more consistently analyse and assess their requirements to balance their position. As such, a shortfall in Margin surplus figure is likely to more frequently translate into a shortfall on-the-day with the associated risk of increased NGC balancing actions and System Warning. Overall, it is anticipated that this will further improve the signals available to market participants in order to manage contracted energy and imbalance risk.

Appendix 2
Publication of 'Day Ahead' and 'After the Day' Margin Information

1 Background

In line with work taken forward by NGC in reviewing information released to the market, from 11th October 2004, NGC is publishing increased levels of information on the level of margin and actions taken to meet margin requirements on a Day ahead and, post-event, on a Day +1 basis.

The overall aim is to increase the transparency of NGC's actions. This data complements and dovetails with other revisions to published data, such as Operational Planning Margin Requirements and Demand Forecast data, being undertaken simultaneously by NGC.

The Day ahead and Day+1 published data relates directly to that used by the Control Room when making decisions on the procurement of additional Reserve. The aim is that publication should increase awareness and understanding of NGC's balancing actions, and therefore imbalance price risk, helping the participants to manage risks and balance their own positions ahead of Gate Closure.

NGC will publish this data on a dedicated page on its Industry Information Website, in the form of PDF files. The files will be published on business days and this will be undertaken on a 'reasonable endeavours' basis.

2 Data to be published

NGC is undertaking to publish the data below by approximately 1500h each business day. There are two separate data sets for each day in question, one set published Day-ahead and one set published Day+1.

At present NGC, receives significant operational data from market participants regarding BM Unit Physical Notification [PN], Maximum Export Limit [MEL] and declared availability (under Grid Code OC2). Part of this submitted short-term data, once aggregated, is available through the publication of the MELNGC (Total MEL above demand forecast) figure on the BMRS. However the specific aggregations used by NGC for its own purposes to manage within-day Reserve have not previously been available to the market ahead of real-time.

Within day, NGC manages the level of Reserve available above forecast demand in order to meet demand in real time. Reserve is held to cover for the within day loss of generation, demand forecast errors, plant shortfalling, etc. The breakdown of Reserve is shown in Figure 2. The data that NGC is publishing relates to the specific portion of Short Term Operating Reserve Requirement [STORR] that is secured on the day. STORR is held by NGC through the final 4 hours before real time. A portion of STORR is met by NGC-contracted balancing services and the balance is secured on the day by NGC. Figure 1 illustrates this in more detail.

2.1 Day Ahead Data publication

At the day-ahead stage NGC will publish two figures. These will be published in the 'ex-ante' .pdf file in the Industry Information Website. These figure reflect:

- Scheduled Reserve Requirement
- Residual Reserve Requirement

The Scheduled Reserve Requirement [SRR] is that level of Short Term Operating Reserve Requirement not already contracted by National Grid. The Residual Reserve Requirement [RRR] is that portion of the Scheduled Reserve Requirement that is not by met by synchronised generation availability as submitted by market participants.

The published Scheduled Reserve Requirement and the Residual Reserve Requirement are based on day-ahead data as submitted to NGC by market participants. These two figures are taken directly from the Control Room Operating Plan, based on the maximum forecast demand peak for the day in question. The two figures are described in more detail below and illustrated in Figure 1.

2.1.1 Scheduled Reserve Requirement

The Scheduled Reserve Requirement gives an indication of the level of reserve to be secured by NGC for the peak of the day.

The Scheduled Reserve Requirement is the level of additional Reserve required by NGC that is not already contracted ex-ante, in order to meet the Short Term Operating Reserve Requirement. The portion of this Requirement that is already contracted is made up from Standing Reserve, other ex-ante Reserve contracts and Contracted Frequency Response. The remaining portion, that must be met 'on-the-day', (the Scheduled Reserve Requirement) is typically met by Free Headroom (MEL-PN on synchronised plant), Market length and through additional dispatch by NGC of balancing services, including: Warming Contracts, PGBTs (Pre Gate closure BMU Transactions), synchronising additional plant in the BM etc.

2.1.2 Residual Reserve Requirement

The Residual Reserve Requirement indicates the portion of the Scheduled Reserve Requirement required to be procured by NGC to meet the overall Short Term Operating Reserve Requirement. It is based on the day-ahead data submitted to NGC by the market and is calculated as follows:

RRR = Maximum Forecast Output – (Demand + STORR) – NGC CR

RRR = Residual Reserve Requirement
Demand = Demand Forecast, including Station Load
STORR = Short Term Operating Reserve Requirement
NGC CR = NGC Contracted Reserve

Maximum Forecast Output = The maximum anticipated output of synchronised generation and active demand-side BMUs, capable of delivering Reserve in Real-time (i.e. sustained delivery of increased export or decreased import), based on PN

and MEL data submitted by market participants. This is also modified to include the notified French Interconnector Flow and to reflect any additional significant technical limitations and non-BMU contributions known to NGC. However, the total excludes any output that requires NGC balancing actions in order to make it available for dispatch in real time

Therefore by subtracting 'Demand Forecast + STORR' and 'NGC CR' from the 'Maximum Forecast Output' this gives the expected level of RRR that remains to be secured by NGC through additional balancing actions. By illustration, if the RRR is positive then no additional Reserve actions are expected to be required. If the RRR is negative, then this represents the level of additional Short Term Operating Reserve Requirement that remains to be secured by NGC.

Any remaining RRR (i.e. any negative figure) may be met by within-day market response (change in PN and MEL submission by BMUs) or by balancing actions as instructed by NGC.

2.2 Day+1 Data publication

At the day-after stage NGC will publish two figures. These will be published in the 'ex-post' .pdf file.

The Day+1 data is based on initial outturn data and data taken from the Final Operating Plan, produced by the Control Room at the Final Planning Stage, approximately four hours ahead of real time. Two items of data will be published:

- Scheduled Reserve Requirement, as above but for the Final Planning Stage
- The level of additional plant warmed by NGC to meet the Operating Margin Requirement

2.2.1 Scheduled Reserve Requirement

The Scheduled Reserve Requirement is calculated as discussed above, but based on data at the Final Planning Stage. It is at the Final Planning Stage that the Control Room makes final decisions on procurement of additional Reserve to meet the Short Term operating Reserve Requirement. At the Final Planning Stage variances from the day-ahead figure could, for example, be the result of:

i. Changes in the availability of NGC contracted Reserve or Response
ii. Changes in System conditions resulting in a change in Response or Reserve Requirements for the peak of the day.

Typically variations from Day ahead to Final Planning Stage are not significant but will affect the level of Residual Reserve Requirement to be secured by NGC.

2.2.2 Level of Warming actions

This figure complements and supplements data already provided on NGC warming actions at longer timescales. For this data, NGC will publish the initial indication of the level of plant warmed by NGC in order to meet the Operating Margin Requirements for the maximum demand peak of the day. This data is already published by NGC but at daily resolution and much greater timescales. The provision of this data at the Day+1 stage will increase visibility of the trend of NGC actions day-on-day allowing the market to better respond to balance the system day-

on-day. The figure represents the aggregate indicated MEL of all units warmed by NGC for the maximum demand peak of the day.

3 Summary

As part of ongoing changes to increase transparency of NGC actions, NGC will publish the following data:

Day Ahead	**Day + 1**
Scheduled Reserve Requirement, Day Ahead	Scheduled Reserve Requirement, Final Planning Stage
Residual Reserve Requirement	Level of Warming actions

This data will give market participants better visibility of NGC actions and the drivers behind those actions, allowing better understanding of balancing actions and associated imbalance price risks.

Figure 1 Illustration of Data to be published - Scheduled Reserve Requirement and Residual Reserve Requirement

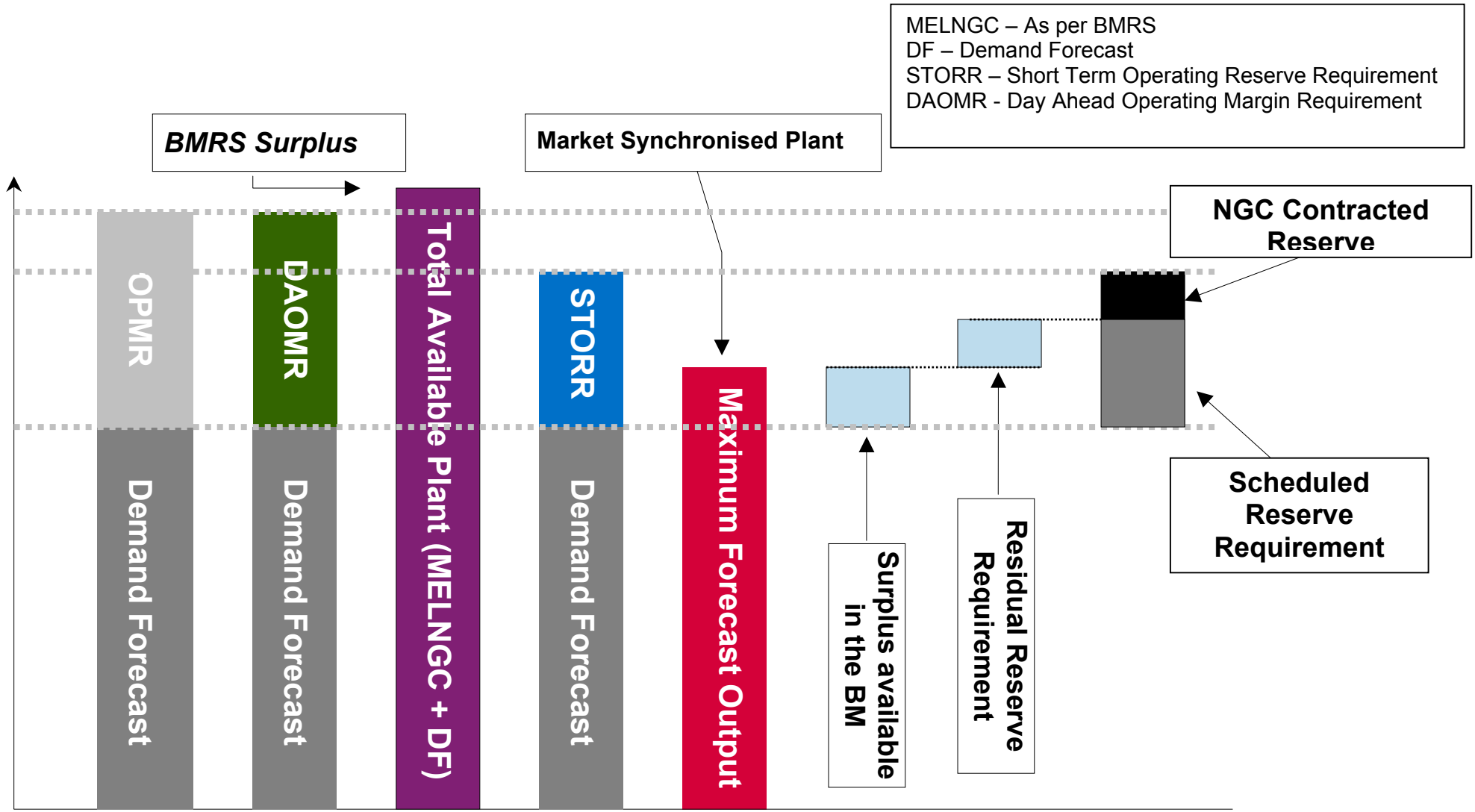
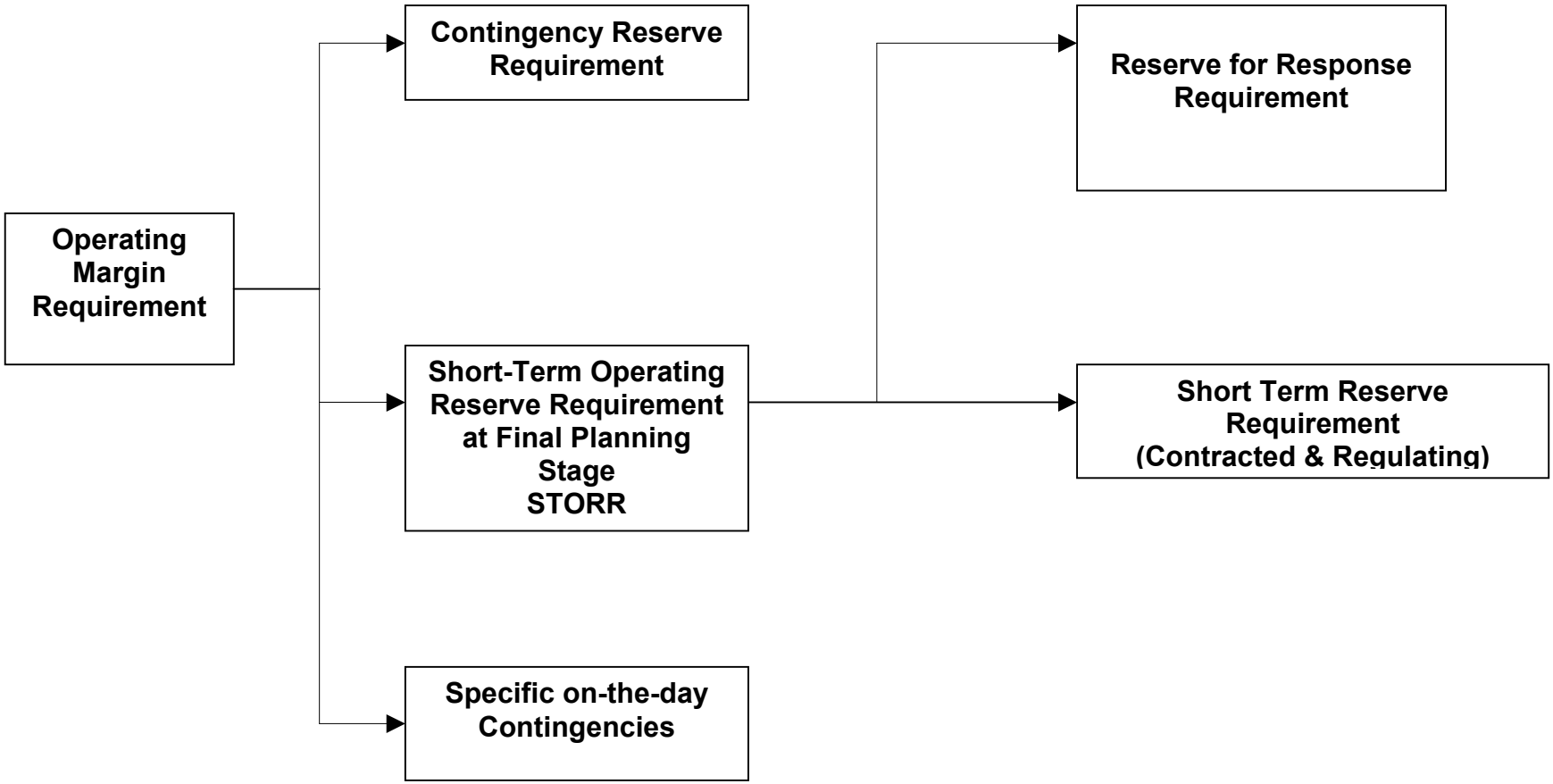


Figure 2 Diagrammatic Breakdown of NGC Reserves



Appendix 3
Treatment of Breakdown Allowance and Station Transformer Demand

1 Generation OU Data

1.1 Definition of Output Usable

This section describes the definition of Output Usable and the impact this has on data submitted by generators.

From 11th October 2004 all generators OU submissions for OC2 timescales will be on a consistent basis

Output Usable is now defined in Grid Code as….

"That portion of ***Registered Capacity*** which is expected to be available and which is not unavailable due to a ***Planned Outage***."

Generators are required to submit Best Estimate **Output *Usable***.
…. The power output at the generator set HV terminals net of unit transformer demand. Best estimate OU figures are the generators' best estimates and **do not** include any allowance for breakdown or station transformer demand in any OC2 timescales.

In practice the best estimate OU is the Generators best estimate acting as a reasonable and prudent generator of the maximum amount of power capable of being delivered having made a deduction for planned outages and other factors that may impact this capability for the requested timescales. It is anticipated that value of OU submitted would be similar to maximum value of MEL for the corresponding timescale.

1.2 Timescales for OU Submissions

The timescales and resolution for submitting OU data remain unchanged.

Timescales	Submitted	Resolution of Data	Comment
2-14 days Ahead	Daily by 11:00 Hrs	Peak of the day	Aggregated data sent to BMRA/ELEXON
2-49 Days Ahead	Wednesday by 11:00 Hrs	Peak of the day	
2-52 Weeks Ahead	Wednesday by 16:00 Hrs	Peak of the Week	
1-2 Future years	Every 6 months	Peak of the Week	
3-5 Future years	Every 6 months	Peak of the Week	

1.3 Specific Timetable from 11th October 2004

This section describes how the changes should in practice impact on Generators' OU submissions from 11 October 2004.

1.3.1 2-14 Day Ahead Data (Daily Resolution, Daily Submission)

11th October by 11:00 hrs, generators submit Output Usable figures for 2-14 day ahead timescales. *No change required.*

11th October by 16:00 hrs, NGC publish margin/surplus figures for 2-14 day ahead timescales. *No change.*

1.3.2 2-49 Day Ahead Data (Daily Resolution, Weekly Submission)

13th October by 11:00 hrs, generators submit Output Usable figures for 2-49 day ahead timescales. *No change required.*

13th October by 16:00 hrs, NGC publish margin/surplus figures for 2-14 day ahead timescales. *No change in the daily 2-49 day data*

1.3.3 2-52 Week Ahead Data (Weekly Resolution, Weekly Submission)

13th October by 16:00 hrs, generators submit Output Usable figures for 2-52 week ahead timescales. C*hange required in 8-52 week timescales where generator OU data does not require any allowance to be made for Station Demand or Breakdown Allowance*

15th October by 16:00 hrs, NGC publish margin/surplus figures for 2-52 week ahead timescales. *Some changes in data likely in 8-52 week timescales when NGC allowance for Station Demand and Breakdown is applied.*

1.3.4 Future Years Data

In January 2005, generators start to submit Output Usable figures for 1-5 year ahead timescales. C*hange required in these timescales where generator OU data does not require any allowance to be made for Station Demand or Breakdown Allowance*

Early 2005, NGC publish margin/surplus figures for 1-5 year ahead timescales. *Some changes in data likely in these timescales when NGC allowance for Station Demand and Breakdown is applied*

2 Demand Forecasts

The proposed change to Output Useable submissions above means that, from 11 October 2004, no allowance will be made by generators for Station Transformer Demand. In order to maintain the balance for the margin calculation, Station Transformer Demand will be added by NGC to the Demand Forecasts.

Historically Station Transformer Demand has NOT been added to the long-term forecasts for 2-14 day (NDFD) or the 2-52 Week forecasts (NDFW).

The NDFD forecast issued at 15:00 on the 11th October 2004 and the NDFW forecast issued at 15:00 on Thursday 14th October will include Station Transformer Demand. The current value of Station Transformer Demand used is 400MW for BST and 500MW for GMT. Pump Storage and Interconnector Demand will be deemed zero on the peak (daily peak for NDFD and weekly peak for NDFW), which is the most likely value. There are NO changes to any other forecasts.

The BMRA help text for 'What are Forecasts?' should then state the '**Long Term Forecasts'** as:

Long Term Forecasts - This forecast is split into National Surplus and National Demand Forecast. For each of these types of forecast, there are 2 ranges - 2 to 14 day ahead (parameters NDFD and SPLD) and 2 to 52 week ahead (parameters NDFW and SPLW) (see forecasts). These forecasts include Station Transformer Load, and assume zero value for Pump Storage Demand and Interconnector Demand values.