



AMENDMENT REPORT

CUSC Proposed Amendment CAP107 Redefinition of Response Energy Payment (REP) For Mandatory Frequency Response

The purpose of this report is to assist the Authority in their decision of whether to implement Amendment Proposal CAP107

Amendment Ref	CAP107
Issue	2.0
Date of Issue	16th August 2006
Prepared by	National Grid

I DOCUMENT CONTROL**a National Grid Document Control**

Version	Date	Author	Change Reference
0.1		National Grid	Draft for internal comment
1.0	11/07/06	National Grid	Draft for Industry comment
1.1	20/07/06	National Grid	Draft for Amendments Panel Recommendation Vote
1.2	4/08/06	National Grid	Draft for Amendments Panel Members comment
2.0	16/08/06	National Grid	Formal version for submission to the Authority

b Document Location

National Grid Website:

www.nationalgrid.com/uk/Electricity/Codes/

c Distribution

Name	Organisation
The Gas and Electricity Markets Authority	Ofgem
CUSC Parties	Various
Panel Members	Various
National Grid Industry Information Website	

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1.0 SUMMARY AND RECOMMENDATIONS

Executive Summary

- 1.1 CAP107 - Redefinition of Response Energy Payment (REP) For Mandatory Frequency Response was proposed by E.ON UK and submitted to the Amendments Panel on 16 December 2005 where it was agreed to proceed to working group. Under the current arrangements a generator who provides frequency response is paid a Holding Payment for the ability to provide the service and is paid, or pays a Response Energy Payment for changes in output resulting from the response to a change in frequency. The Response Energy is priced at a reference price, which is the time weighted, average of System Buy Price and time weighted average System Sell Price for the preceding calendar month.
- 1.2 The proposed change to the calculation provides for the generator to pay or be paid its first Bid Price for changes in energy output which occur as a result of delivering frequency response for each Settlement Period in which it is required to provide Frequency Response Energy.
- 1.3 The basis for the calculation of the REP was subsequently re-defined by the Working Group as within its Terms of Reference from Bid Price -1 to Offer price -1. For clarity it was therefore agreed that the price to use should be the Offer Price-1 (i.e. the first unwinding offer price associated with the first bid). The Working Group, including the Proposer considered that this clarification was consistent with the terms of reference and as a result did not constitute an alternative to the original proposal

WGAA A Re-definition of REP Use of Imbalance Prices (SBP for Primary and Secondary Response and SSP for High Frequency Response) per Settlement Period

- 1.4 The Working Group developed an alternative proposal where the basis for the REP would be the actual prevailing SBP or SSP for the half hour settlement period in which the response was called for net volume response energy delivered over the half hour. Therefore a generator would be paid SBP for low frequency (Primary and Secondary) response and would pay SSP for providing High Frequency response.

WGAA B Re-definition of REP Use of Market Index Price per Settlement Period

- 1.5 A second Working Group alternative proposal was developed which used the Market Index Price (Market Index Price) parameter as the basis for REP. The REP would be based on Market Index Price with different multipliers; 0.75 for High Frequency and 1.25 for low frequency, net volume of response energy delivered over the half hour in each Settlement Period.

Working Group Recommendation

- 1.6 The Working Group recommended to the CUSC Panel on 19th May 2006 that CAP107 should proceed to wider Industry Consultation as soon as possible. The Working Group believed that it had met its Terms of Reference, that CAP107 has been fully considered and recommended WGAA B Redefinition of REP use of Market Index Price per Settlement Period.

National Grid's Recommendation

- 1.7 National Grid does not support the Original Proposal but does support WGAA B Redefinition of REP Use of Market Index Price per Settlement Period. Although the objectives of the Original Proposal, closer to real time pricing and cost reflectivity, are supported in principle, the effect of the Original Proposal would in our view be to introduce significant sub-optimality in to the frequency response dispatch decision making process. The inability to optimise will result in inefficient and uneconomic actions resulting in greater costs to the industry. Further-more, the predictive nature of the problem is virtually impossible to solve. The Original Proposal would require significant IS development without any guarantee that it will protect against the risks associated with the sub-optimality.

Amendment Panel Recommendation

- 1.8 The CUSC Amendments Panel Recommendation Vote on CAP107 was conducted at the Panel Meeting on 28th July 2006. On the question of whether CAP107 would BETTER facilitate achievement of the Applicable CUSC Objectives, the Panel vote was as follows:

CAP107 Original	- No	- Equal split for and against
CAP107 WGAA	- Yes	- unanimous
CAP107 WGAB	- Yes	- unanimous

- 1.9 The Panel unanimously recommends that CAP107 Working Group Alternative B would BEST facilitate achievement of Applicable CUSC Objectives.
- 1.10 The implementation date for CAP107 Working Group Alternative B is 3 months after the Authority decision. If the Authority were to approve the CAP107 Original Proposal or CAP107 Working Group Alternative A: the implementation date for WGAA is also 3 months after the Authority decision, and the Panel by a majority recommends that the CAP107 Original Proposal should be implemented on 1st April 2008 if a decision is received prior to 30th April 2007 or 11 months from the Authority decision thereafter.

2.0 PURPOSE AND INTRODUCTION

- 2.1 This Amendment Report has been prepared and issued by National Grid under the rules and procedures specified in the Connection and Use of System Code (CUSC) as designated by the Secretary of State. It addresses issues relating to Response Energy Payment (REP) for Mandatory Frequency Response.
- 2.2 Further to the submission of Amendment Proposal CAP107 (see Annex 2) and the subsequent wider industry consultation that was undertaken by National Grid, this document is addressed and furnished to the Gas and Electricity Markets Authority ("the Authority") in order to assist them in their decision whether to implement Amendment Proposal CAP107.
- 2.3 CAP107 was proposed by E.ON UK and submitted to the CUSC Amendments Panel for consideration at their meeting on 16 December 2005. CAP107 Working Group Report was submitted to the CUSC panel meeting on 19 May 2006. Following evaluation by the Working Group, the

Amendments Panel determined that CAP107 was ready to proceed to wider industry consultation by National Grid.

- 2.4 This document outlines the nature of the CUSC changes that are proposed. It incorporates National Grid's recommendations to the Authority concerning the Amendment. Copies of all representations received in response to the consultation have been also been included and a 'summary' of the representations received is also provided. Copies of each of the responses to the consultation are included as Annex 3 to this document.

BACKGROUND

Current Process for Frequency Response Dispatch

- 2.5 National Grid has a statutory obligation to maintain system frequency within 1% of 50Hz, save in abnormal or exceptional circumstances. Therefore National Grid seeks to normally operate the system frequency in the range 49.8 to 50.2Hz to avoid the risk that, following the largest generation loss, the system frequency would fall to 48.8Hz (at which point the first 5% of customer demand would be tripped).
- 2.6 Under the current arrangements National Grid manages system frequency by two means. Firstly, it accepts Bids or Offers in the Balancing Mechanism to meet predicted demand. However, actual demand will be different from predicted demand and it may change rapidly or generation units may breakdown etc. To contain the change in system frequency as result of these uncertainties, National Grid instructs BMUs and other providers to provide the automatic service of frequency response.
- 2.7 Under the current arrangements the provision of mandatory frequency response is defined as follows:
- Primary Response: the automatic response to a decrease in system frequency which is effective increasingly 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.
 - Secondary Response: the automatic response to a decrease in system frequency which is effective increasingly with time over the period 0 to 30 seconds from the time of the frequency change (and fully available by the latter) and which must be sustainable for at least a further 30 minutes.
 - High Frequency Response: the automatic response to an increase in system frequency which is effective increasingly 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.
- 2.8 In managing frequency response dispatch, National Grid has an online information system that optimizes the decision as to which plant to re-load and/or instruct response to control the frequency. The dispatch facility provides advice to the control room on the selection of Frequency Response services to help manage frequency in the most economic and efficient manner possible. An algorithm re-runs approximately every five minutes in support of this process. The facility takes in to account; the holding prices (Primary, Secondary, High), the associated cost of Bids/Offer to move plant

and the contracted volume for each genset by deload point. The REP price is not presently optimized because it is a common value applicable to all providers of mandatory frequency response and as such has no bearing on the merit order derived by the facility.

- 2.9 Once the frequency dispatch algorithm has provided an answer, the control room will issue open ended frequency response instructions and, if necessary, the appropriate Bid/Offer Acceptances to move the relevant plant Balancing Mechanism Units' output.

Current Payment Arrangements for Mandatory Frequency Response

- 2.10 Presently, a generator who provides frequency response under Section 4 of the CUSC is paid a Holding Payment for providing the capability and is paid, or pays, a Response Energy Payment (REP) for changes in output which result when the generator actively responds to a change in frequency. Note that the REP volume cannot be metered (because Generator metering is only half-hourly), and so a volume is calculated from the minute-by-minute frequency trace, on the assumption that each responsive generator delivers energy exactly in accordance with the Power Delivery Data Table for that Unit. The REP is priced at a reference price which is the average of the time weighted average System Buy Price and time weighted average System Sell Price for the preceding calendar month. Conceptually the REP has been designed to reflect the cost of providing the energy.

- 2.11 The two payments for the provision of frequency response are summarised as follows:

Holding Payment – is the payment per minute for providing the service (dependent on combination of response being provided). This is calculated on the basis of the payment rates submitted by providers.

Response Energy Payment - Payment per MWh for deviation in output as a result of providing response. The payment is based on a Reference Price average of SBP and SSP for the previous calendar month.

- 2.12 This Amendment Report has been prepared in accordance with the terms of the CUSC. An electronic copy can be found on the National Grid website, at www.nationalgrid.com/uk/Electricity/Codes/.

3.0 PROPOSED AMENDMENT

- 3.1 CAP107 proposes a change to the calculation of the Response Energy Payment (REP) under section 4.1.3A of the CUSC. It proposes that this calculation is revised so that a generator pays, or is paid, its first Bid Price -1 for changes in energy output which occur as a result of delivering frequency response.
- 3.2 The basis for the calculation of the REP was subsequently clarified by the Proposer and agreed by the Working Group as within its Terms of Reference from Bid Price -1 to Offer price -1. For clarity it was therefore agreed that the price to use should be the Offer Price-1 i.e. the first unwinding offer price associated with the first bid. The Working Group considered that this alteration was consistent with the terms of reference and as a result did not constitute an alternative to the original proposal.
- 3.3 The Proposer believes that there are defects associated with the present definition of REP. In particular the Proposer argues that because of the average and retrospective nature of the present calculation the REP is not reflective of the costs incurred by different individual generation plant with different fuel costs at the time they are required to provide frequency response energy.
- 3.4 This places an incentive on generators in the view of the Proposer to cover their potential exposure by increasing their Holding Payment rates. The Holding Payment rates can only be changed once a month by generators for use in the successive calendar month. Therefore, the level of risk premium has to reflect the uncertainty of the level of usage of the service and the degree of uncertainty as to how an individual BMU's costs, with different types of fuel, will differ from the Reference Price.
- 3.5 The proposal suggests that the solution to the identified defect could be provided by a payment mechanism where parties pay, or are paid, the relevant BMU a price equivalent to its first Bid Price (subsequently clarified as Offer Price -1). By doing so the generator concerned is able to more accurately recover its actual costs. The Proposer suggests that the precise solution would be that the generator is paid its Offer Price when the delivery of response results in additional output from the BMU during the relevant period and require it to pay its Bid Price when the response results in reduced output from the BMU. However, the Proposer suggested a single price is used in order to simplify the solution. An additional benefit that has been suggested with the single price solution is that it is self regulating against market opportunity, as for example a generator called for High Frequency would pay out against that price.
- 3.6 Through the course of the Working Group discussions, the Proposer clarified a number of issues associated with the original proposal. It was confirmed that the use of the First Undo Offer as the basis for the REP would be the least disruptive approach to participants Bid /Offer pricing strategies.
- 3.7 Discussions were progressed in the Working Group on whether this clarification was within the scope of the original proposal or whether it constituted an alternative amendment in its own right. It was concluded by the Working Group that this clarification was consistent with its terms of reference and as a result did not constitute an alternative to the original proposal. This because the Working Group were required to assess whether the use of Bid Price -1 was the most appropriate price to use.

- 3.8 For details of the full working group discussions refer to the CAP107 Consultation Document at http://www.nationalgrid.com/NR/rdonlyres/7F69B83E-6D98-4BE3-9AEC-751C98508918/7255/Consultation_CAP107v10.pdf

4.0 ALTERNATIVE AMENDMENTS

Working Group Alternative

WGAA A Re-definition of REP Use of Imbalance Prices (SBP for Primary and Secondary Response and SSP for High Frequency Response per Settlement Period)

- 4.1 In consideration of the original proposal the Working Group agreed to the progression of development of an alternative proposal based on SBP to compensate for increasing changes in energy output for low frequency, Primary and Secondary Response, and SSP for reducing energy output called for High Frequency response
- 4.2 The prices used as the basis for the REP would be the actual prevailing SBP and SSP for the half hour settlement period in which the response was called for net volume response delivered over the half hour. Therefore a generator would be paid SBP for low frequency response and would pay SSP for providing High Frequency response. It was felt that paying SBP was appropriate as it reflected the marginal cost of energy, which response provision arguably fell in to.
- 4.3 When considering the overall impact to the costs faced by the industry as a reflection of potential individual generators costs, the Working Group analysed four months; April 2005, July 2005, October 2005 and February 2006 to provide an indicative year. These prices were then applied to the overall monthly amount of response energy provided to obtain the net position. Figure 4, below, shows the actual net position for Response Energy payments for these months and in turn, Figure 5, below, shows the effect that the use of the Imbalance Prices would have:

Figure 4

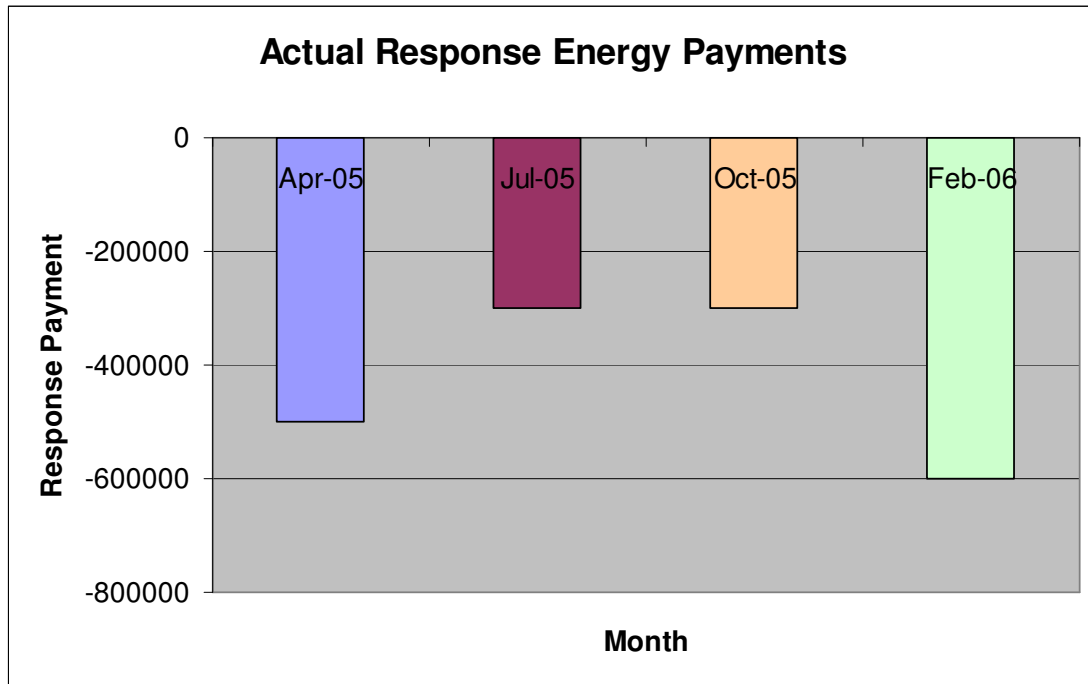
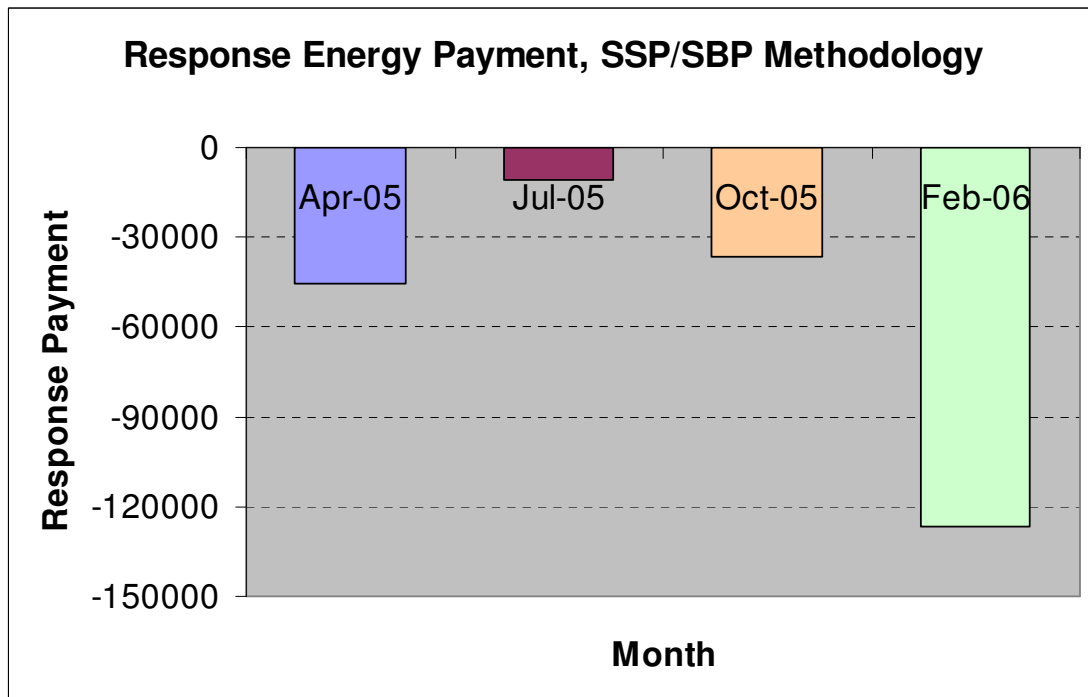


Figure 5.



4.4 Concern was expressed by the Working Group as to the volatility of the Imbalance Prices and in particular the use of SSP for High Frequency response. It was felt that high SSP prices could lead to large payments being made by generators for reducing output.

- 4.5 A consequence, however, of higher energy payments could be that holding prices could become more competitive because generators may want to be available to benefit from the higher payments for low frequency response. This may have the knock-on affect of reducing total holding costs. As such, whilst total costs for Mandatory Frequency Response may remain broadly the same, the distribution of payments between holding and energy response may more appropriate to reflect the costs of providing the response energy at the time it is called for. This retains the principle that the energy utilisation payment should be cost reflective. This could potentially also have system security benefits as more plant could therefore be economically available for response.
- 4.6 There are still likely to be parties that overall gain a net benefit and those parties conversely that do not, depending on how they are despatched in relation to the prevailing frequency conditions on the network. The proposed alternative does, however, have the benefit of potentially paying a more accurate price for response energy than the present arrangements as it uses prices closer to real time. Importantly it maintains a common response price for all generators so removes the risk of sub-optimal response despatch, and the high costs risk associated with individual generator submitted high prices

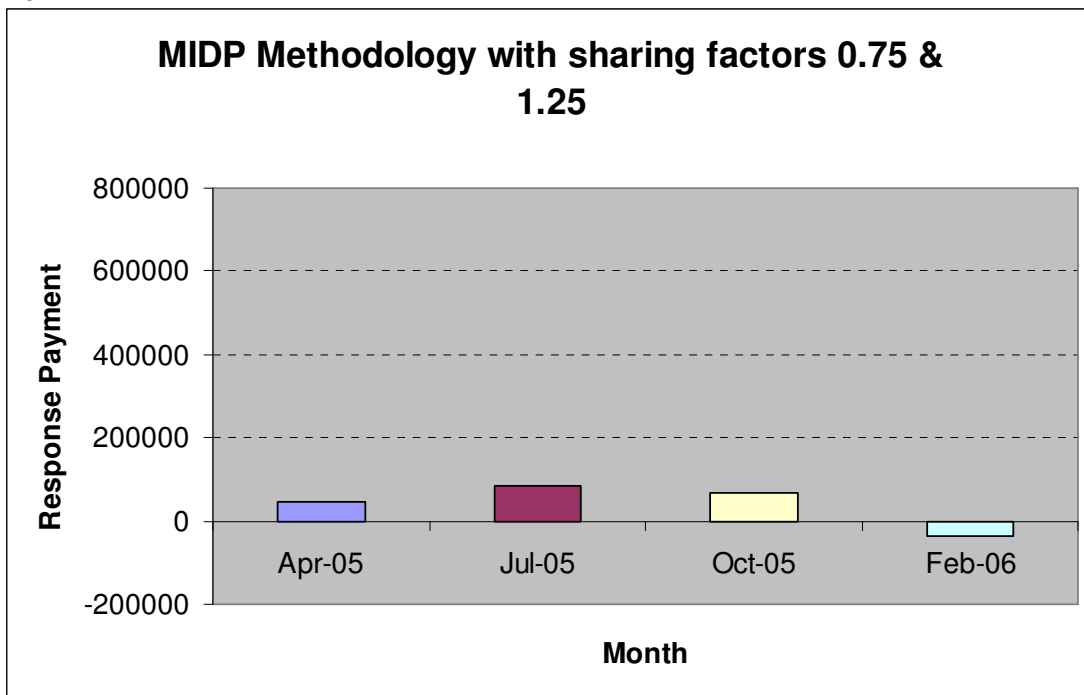
WGAA B – Re-definition of REP Use of Market Index Price per Settlement Period

- 4.7 Following analysis and subsequent concerns expressed regarding the price volatility associated with WGG A, a further alternative was developed. A formula based on the Market Index Price plus and minus a percentage, as a proxy for SBP and SSP was proposed. Market Index Data is used in Settlement to calculate a price expressed in £/MWh in respect of each Settlement Period which reflects the price of wholesale electricity in respect of that Settlement Period in the short term market.
- 4.8 Whilst this second Working Group Alternative has many of the characteristics of the Imbalance Price alternative above, it was generally agreed by the Working Group that this option would address the degree of risk associated with the exposure of National Grid to the spread between SBP and SSP and generators' exposure to more extreme imbalance prices in any given Settlement Period.
- 4.9 Initially the Working Group assessed the Market Index Price option against multipliers of 2.5 for low frequency provision and 0.5 for high frequency, when initially assessing the original proposal and the Imbalance Price (SBP/SSP) alternative option. These multipliers were based on National Grid's Net Imbalance Adjustment value taken from the Transmission Licence.
- 4.10 Due to the results seen from the original analysis for the use of the Market Index Price multipliers of 2.5 for low frequency provision and 0.5 for High Frequency response the Working Group sought to consider other multipliers. The aims were twofold. Firstly, to achieve prices which were reflective of the average spread of SBP and SSP around the Market Index Price. Secondly, to achieve a neutral or as close to neutral effect based on the use of historic data. It was felt that this would overcome the perceived disadvantages of the Imbalance Price option. To achieve this, further analysis was undertaken that looked at different multipliers used with the Market Index Price with the aim of addressing the potential costs faced by the industry to derive a neutral position. A set of four months was chosen; April 2005, July 2005, October 2005 and February 2006 to provide an indicative year. These prices were

then applied to the overall monthly amount of response energy provided to obtain the net position.

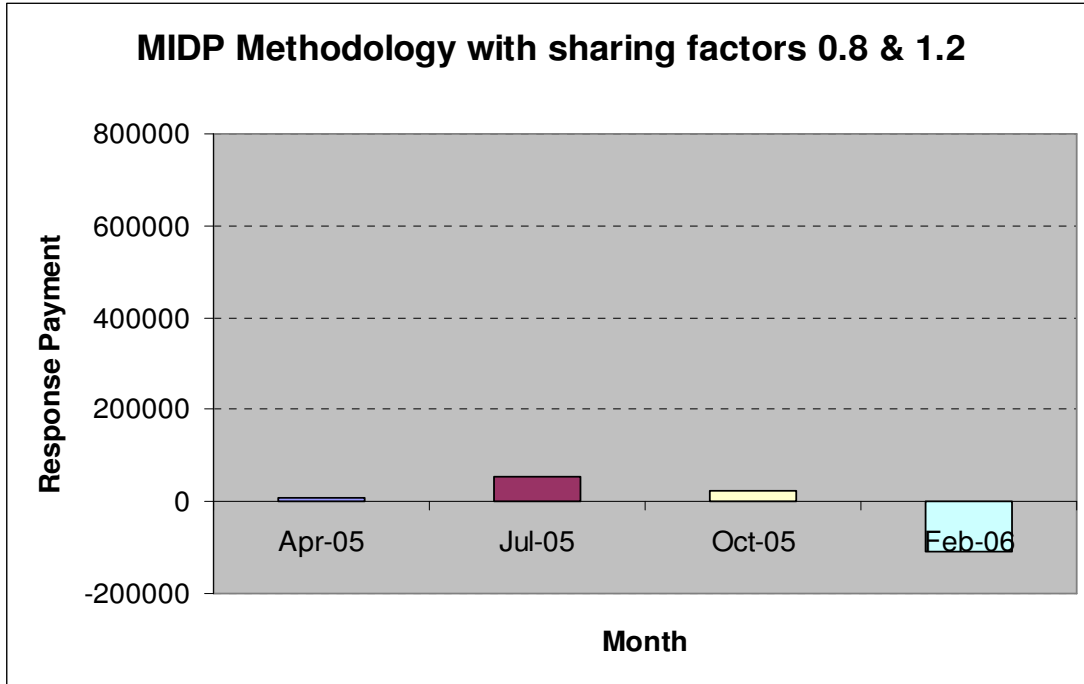
- 4.11 Annex 1 shows all the analysis undertaken of different multipliers to achieve a neutral or as close to neutral position as possible. A picture is developed that shows that as the multipliers used become closer, the neutral position, in terms of overall costs to the industry, closes. This is based on the historic data used and when compared to the current arrangements shown in Figure 4 above. By comparison analysis of the Imbalance Price option showed that although the payments increased, the net overall position to National Grid was lower when compared to the present arrangements. This was not however as close to the neutral position that could be achieved using the appropriate multipliers against Market Index Price. (Note: within the accompanying diagrams Market Index Price has been abbreviated to 'MIDP', this should not be confused with the Market Index Data Provider under the Balancing and Settlement Code).
- 4.12 The net position closest to neutral in terms of net overall payments to the industry would use multipliers of 0.75 for High Frequency provision and 1.25 for low frequency (Primary and Secondary) mandatory response provision, this is shown in Figure 6 below:

Figure 6.



- 4.13 The Working Group also undertook price analysis to consider the historic average percentage difference between SBP and SSP in relation to Market Index Price. This showed that over the last two years SBP and SSP have on average been 120% and 80% of Market Index Price respectively (shown in Annex 1 below). Additionally, an example looking at 29th December 2005 on a day of record prices, showed that the Market Index Price option would have been less volatile (also shown in Annex 2 below). Analysis of the Market Index Price option that uses 0.8 for High Frequency and 1.2 for low frequency response provision was assessed, in figure 7 below.

Figure 7



- 4.14 On balance it was the Working Groups' view that the multipliers of 0.75 for High Frequency provision and 1.25 for Low Frequency provision were the most appropriate as a surrogate for SBP and SSP. This is because although the price analysis showed the typical distribution between the prices was 0.8 and 1.2, when this is compared with the historical analysis the multipliers of 0.75 and 1.25 more closely achieve the neutral position. It was recognised by the Working Group that these are the best parameters to use in light of present prices within the market. Should price behaviour change significantly in future however, it may be appropriate to review the multipliers used.
- 4.15 Working Group Alternative Amendment B would therefore be based on the use of Market Index Price with different multipliers of 0.75 for High Frequency and 1.25 for low frequency (Primary and Secondary) response provision, net volume of response energy delivered over the half hour in each Settlement Period.
- 4.16 There are still likely to be parties that overall gain a net benefit and those parties conversely that do not, depending on how they are despatched in relation to the prevailing frequency conditions on the network. The proposed alternative does, however, have the benefit of potentially paying a more accurate price for response energy than the present arrangements as it uses prices closer to real time. Importantly it maintains a common response price for all generators so removes the risk of sub-optimal response despatch, and the high costs risk associated with individual generator submitted high prices

5.0 ASSESSMENT AGAINST APPLICABLE CUSC OBJECTIVES

Original Amendment Proposal

- 5.1 (a) the efficient discharge by the licensee of the obligations imposed upon it under *the Act and by this licence*.
- 5.2 However National Grid believes that the Original Amendment does not better facilitate the CUSC Applicable Objectives. Whilst it agrees in principle to the defect that the Original Amendment is seeking to address, the potentially high cost risks of sub-optimal response dispatch and the potential implementation costs are disproportionate to the potential overall industry cost that the Original Amendment is seeking to re-allocate.

Working Group Alternative Amendments

CAP 107 Working Group Alternative A (WGAA A) Re-definition of REP Use of Imbalance Prices (SBP for Primary and Secondary Response and SSP for High Frequency Response) per Settlement Period

- 5.3 Whilst a majority of the working group considered that this alternative provided a better option than the current baseline, Working Group Alternative Amendment B and the Original Amendment received more support. None of the working group members believed that WGAA A was the best of the proposed solutions.
- 5.4 One member of the Working Group believed that this Alternative Proposal better facilitated the CUSC Applicable Objective b) in particular.
- 5.5 A number of Working Group members felt that the this Alternative did not satisfy the Applicable Objectives and felt that the concerns expressed over the impact on volatility of the Imbalance Prices and in particular SSP meant that it could not be supported by the majority of the Working Group as the best option. This proposal has the benefit that the solution could be implemented in shorter timescales with minimum changes to both system operator and participant systems.
- 5.6 National Grid supported this Working Group Alternative Amendment as better facilitating the Applicable Objectives as it more proportionately addressed the defects that the Amendment Proposal was seeking to address, without the high cost risks of sub-optimal response dispatch and the associated implementation costs.

WGAA B Re-definition of REP Use of Market Index Price per Settlement Period

- 5.7 All members of the Working Group agreed that WGAA B better facilitated both of the CUSC Applicable Objectives and it received the highest level of support that this best facilitated the Applicable Objectives.
- 5.8 All members of the Working Group were in support of WGAA B as they believe it addressed the defect identified by the original Amendment Proposal, in particular the prices likely to be more stable than imbalance prices. This proposal also has the benefit the solution could be implemented in shorter timescales with minimum changes to both system operator and participant systems.
- 5.9 National Grid considered that this second Alternative Amendment Proposal best facilitated the Applicable Objectives as it more proportionately

addressed the defects that the Amendment Proposal was seeking to address, without the high cost risks of sub-optimal response dispatch and the associated implementation costs.

- 5.10 Consultation Response assessments against the applicable objectives are captured in section 10.

Consultation Alternative Amendment

- 5.11 No Consultation Alternative Amendments were raised.

6.0 PROPOSED IMPLEMENTATION

Original Amendment

- 6.1 The Working Group originally considered that the CAP107 Original Proposal could be implemented 3 months after an Authority decision. However, prior to industry consultation, National Grid indicated that the Original Proposal could not be implemented before 1st April 2008 due to the extensive nature of the IS developments required to facilitate the change (with a cost of approximately £600K).
- 6.2 The 1st April 2008 date was based upon an Authority decision being received by April 2007. If the Authority decision is made after 30th April 2007, National Grid proposed an implementation date 11 months after the Authority decision.
- 6.3 However, the Working Group Recommendation was for implementation 3 months after an Authority decision, therefore requiring the Amendment Panel to make a recommendation in accordance with CUSC 8.20(g).

Original Amendment Panel Implementation Recommendation

- 6.4 The Panel discussed the implementation of the Original Proposal, and National Grid highlighted the reasons behind the proposed date. National Grid stated that a considerable amount of IS development is required to implement this solution, including robust end to end testing of key operational systems used in real time operation. Systems interfaces both to other National Grid systems but also to external market systems would need to be validated and tested. The software used within the Control Room is bespoke, and the earliest availability of the resource required for this work would be April 2007, given that it is fully employed on other industry initiatives and key operational requirements. Following this date, National Grid would require a period of 11 months to develop the change, hence the earliest implementation date of 1st April 2008.
- 6.5 The Panel by a majority vote recommended National Grid's implementation date for the IS reasons stated above.

Working Group Alternatives

- 6.6 The Working Group and National Grid with Industry support propose CAP107 WGAA A and WGAA B should be implemented 3 months after an Authority decision to allow changes to be implemented to National Grid's settlement systems.

7.0 IMPACT ON THE CUSC

- 7.1 CAP107 original requires amendments to Section 4.1.3.9A (a) and 4.1.3.9A (d) of the CUSC.
- 7.2 CAP 107 WGAA A requires amendments to Section 4.1.3.9A (a) and 4.1.3.9A (d) of the CUSC.
- 7.3 CAP 107 WGAA B requires amendments to Section 4.1.3.9A (a) and 4.1.3.9A (d) of the CUSC.
- 7.4 The text required to give effect to the Original Proposal is contained as Part A of Annex 2 of this document.
- 7.5 The text to give effect to the Working Group Alternative Amendment A is attached as Part B of Annex 2 of this document. The text for WGAA A contains additional drafting to compensate for the Imbalance and Market Index Price default rules in the Balancing and Settlement Code. This has been added to avoid any potential for negative prices to apply
- 7.6 The text to give effect to the Working Group Alternative Amendment B is attached as Part C of Annex 2 of this document. The text for WGAA B contains additional drafting to compensate for the Imbalance and Market Index Price default rules in the Balancing and Settlement Code. This has been added to avoid any potential for negative prices to apply. In addition the drafting is intended to cover the potential for more than one Market Index Data Provider in the calculation of the Market Index Price.

8.0 IMPACT ON CUSC PARTIES

Proposed Amendment

- 8.1 CAP107 has an impact upon providers instructed to deliver mandatory frequency response. Under the original proposal the costs or revenues associated with the energy payment of mandatory frequency response will be reflective of the prices submitted by those individual providers. This is as opposed to the current baseline where the price is derived from an historical average of SBP and SSP.

Working Group Alternative Amendment

- 8.2 CAP107 Working Group Alternative Amendment A has an impact upon providers of mandatory frequency response. Under this alternative dual response energy prices will be derived. Parties who are expected to reduce output as a consequence of the provision of frequency response will pay SSP multiplied by their expected response energy volume (RE_{ij}) in that period. Parties who are expected to increase output as a consequence of the provision of frequency response will be paid SBP multiplied by their expected response energy volume (RE_{ij}) in that period
- 8.3 CAP107 Working Group Alternative Amendment B has an impact upon providers of mandatory frequency response. Under this alternative dual response energy prices will be derived. Parties who are expected to reduce output as a consequence of the provision of frequency response will pay MIDP*0.75 multiplied by their expected response energy volume (RE_{ij}) in that

period. Parties who are expected to increase output as a consequence of the provision of frequency response will be paid MIDP*1.25 multiplied by their expected response energy volume (RE_{ij}) in that period.

Consultation Alternative

8.4 Not applicable

9.0 IMPACT ON INDUSTRY DOCUMENTS

Impact on Core Industry Documents

9.1 At this stage no impact has been identified from CAP107 on other Core industry documents

Impact on other Industry Documents

9.2 At this stage no impact has been identified from CAP107 on other industry documents

10.0 IMPACT ON INDUSTRY COMPUTER SYSTEMS OR PROCESSES

10.1 CAP107 original proposal has an impact upon National Grid IS Systems due to the need to enhance existing tools, to build in defensive measures against high prices and to develop additional offline advice tools to the control room, along with accompanying settlement system changes.

10.2 CAP107 WGAA A and WGAA B has an impact on National Grid settlement systems and changes would need to be implemented hence National Grids request for a 3 month implementation period post Authority Decision.

11.0 VIEWS AND REPRESENTATIONS

11.1 This Section contains a summary of the views and representations made by consultees during the consultation period in respect of the Proposed Amendment and the Alternative Amendment.

Views of Panel Members

11.2 A Panel Member made some comments on the consultation to improve the text. The comments sought a better description of the balance of risk, between the price risk of WGAA A and B as a trade off against the sub-optimality risk of the Original Proposal. The Panel Member also wanted clarity that the WGAA's only fully address the closer to real time pricing aspect of the proposal and that the cost reflectivity aspect could still leave some parties benefiting to a greater extent than others, as is the case with the current baseline. These changes have been included in version 1.1 of the Working Group Report and reflected in this consultation, which the Panel agreed should proceed to industry consultation

View of Core Industry Document Owners

11.3 Neither the CAP107 Original, nor either of the Working Group Amendment Alternatives, will have an impact on Core industry Documents or other industry documents

Working Group

- 11.4 The Working Group propose that CAP107 WGAA B Use of Market Index Price per Settlement Period should be implemented three months following an Authority decision.

Responses to Consultation

- 11.5 The following table provides an overview of the representations received. Copies of the representations are attached as Annex 3.

Reference	Company	Supportive	Comments
CAP107-CR-01	British Energy	No	Does not support any of the alternatives but finds WGAA B the least unacceptable
CAP107-CR-02	EDF Energy	Yes	Supports WGAA B only
CAP107-CR-03	RWE	Yes	Supports the Original
CAP107-CR-04	First Hydro / International Power	Yes	Supports the WGAA B only
CAP107-CR-05	Gaz de France	Yes	Supports WGAA B only
CAP107-CR-06	E.ON	Yes	Supports all alternatives in following reducing preference 1. Original 2. WGAA B 3. WGAA A
CAP107-CR-07	For and on behalf of: Scottish and Southern Energy, Southern Electric, Keadby Generation Ltd., Medway Power Ltd., SSE Generation Limited and SSE Energy Supply Ltd.	No	Does not support any of the proposed amendments

Detailed Points made through Consultation Responses and National Grid's response

11.6 British Energy

- 11.6.1 In their response to the CAP107 Consultation British Energy stated that they did not believe that any of the amendments better facilitates the Applicable CUSC objectives when compared to the current baseline. However if a change had to be made to Response Energy Payment (REP) then they believe that WGAA B would be the preferred option.
- 11.6.2 British Energy agree with National Grid that the original amendment would have the effect of introducing significant sub-optimality in the frequency response dispatch decision making process, which would result in greater costs to the industry.
- 11.6.3 They do not believe that the current arrangements have had sufficient time to "Bed in" and should be left for at least another winter, however if a change

has to be made they believe it should be WGAA B, which is the less volatile of the options available.

11.7 **EDF Energy**

11.7.1 In their response to CAP107 EDF Energy agree with the working group that the design of the REP system can influence holding prices that are submitted and the availability of plant and agree that a change is required.

11.7.2 EDF Energy believes that the working group alternative amendment, WGAA B is the most suitable amendment of the three proposals.

11.7.3 The respondents do not believe that the benefits of the original proposal justify the costs of implementation, and therefore do not believe it meets objective A. For WGAA A the respondents consider that it is inappropriate for the REP payments to be linked to imbalance prices that can be changed at any time by modifications to the BSC, and BSC modification 194 is likely to increase volatility.

11.7.4 EDF Energy believe that WGAA B should better reflect the spread between the marginal costs of providing primary/secondary response and high frequency response therefore allowing providers to submit more competitive holding prices for all three types of frequency response. The CUSC objective (a) should be fulfilled through all payments being established on the same price, which should provide efficient dispatch optimisation by National Grid

11.8 **RWE**

11.8.1 The respondent believes that CAP107 does better facilitate the CUSC objectives by removing the inevitable inefficiency arising from the current arrangements. The respondent states the benefit of the change to the energy pricing arrangement ought to be that providers are able to ignore the energy price when setting their holding payments. Thus, the less volatile option of WGAA B better facilitates the efficient working of the frequency response arrangements. However their may still be concern over losses being incurred with potentially high market prices.

11.8.2 RWE do not share National Grid's concerns over sub-optimality and consider National Grid are over-stating the issue.

11.8.3 The respondent believes the concern expressed about the potential to change prices near to real time should be mitigated by the fact that submitted prices are seen by the SO an hour ahead of real time, and RWE do not anticipate that prices would change very frequently to the extent envisaged by National Grid.

11.8.4 The respondent states that the proposed implementation timescales for the original proposal appear extremely long and potentially impact on the benefits of the amendment, and suggest an approach to derive an expected energy delivery volume at each de-load point, which when applied to the energy price, could be used as an addition (positive or negative) to the holding prices for that unit. The optimisation process would then be identical to that currently employed.

11.9 International Power

- 11.9.1 International Power do not support the idea of utilising a Balancing Mechanism offer pricing parameter for the purposes of pricing response energy payment, and therefore does not support the Original Proposal.
- 11.9.2 The respondent believes WGAA A improves cost-reflectivity in terms of the prevailing value of balancing energy, close to real time. However they are concerned that there is still potential to influence SBP and SSP, thus distorting response energy payments.
- 11.9.3 International Power state that WGAA B improves on WGAA A by replacing the SBP and SSP and thus reduces the volatility created by using SBP and SSP, and they concur with the estimates made in terms of industry implementation.
- 11.9.4 International Power supports the second Working Group Alternative WGAA B, and that of the three options it best facilitates the objectives.

11.10 Gaz de France

- 11.10.1 The respondent agrees that a redefinition of the response energy price is necessary in the wake of CAP047, and support Working Group Alternative Amendment B. The respondent agree with a REP based upon real-time market prices, they believe that WGAA B is a more cost effective to implement than the original proposal, and that it avoids the exposure of generators to extremes that are implied by WGAA A.

11.11 E.ON

- 11.11.1 E.ON are disappointed that National Grid's estimated costs and lead times for implementing the original proposal make it appear less attractive than it could be. The respondent understands Nation Grid has concerns that this will increase its risk when instructing generators to provide frequency response but states that at present generators are taking this risk individually.
- 11.11.2 WGAA A – The respondent states that whilst this option is better than the current baseline it is not as comprehensive as the original. It has the benefit that it is less costly and quicker to implement than the original but only addresses 1 of the 2 issues. The respondent agrees that potential volatility is a risk with this option, however this still better meets the applicable objectives than the present baseline.
- 11.11.3 E.ON support the option chosen for WGAA B of a spread of 25% either side of MIP, and believe this is more likely to reflect the position post introduction of P194, however they recommend that this value is periodically reviewed and an amendment raised if the 25% figure is no longer found to be representative. The respondent believes that WGAA B is better than WGAA A, however they do not believe either is better than the original proposal.

11.12 For and on behalf of: Scottish and Southern Energy, Southern Electric, Keadby Generation Ltd., Medway Power Ltd., SSE Generation Limited and SSE Energy Supply Ltd.

- 11.12.1 The respondent is mindful that those parties that already operate at the optimum level; i.e. maximising their output to achieve the most efficient output from the plant both economically and environmentally; would be

required, in providing mandatory frequency response, to reduce their output by de-loading. Reviewing the CAP107 Original and the two Working Group Alternatives we believe that these parties could be adversely affected by this proposed change. The respondent therefore does not support CAP107.

- 11.12.2 SSE asked for clarification on how many Market Index Data Providers there currently are and their names. There is currently only one Market Index Data Providers and that is APX.

11.13 National Grid View

11.13.1 National Grid advocates the evolution of market pricing principles where they lead to effective competition and the consequential lowering of costs to the industry. However we do not believe that the CAP107 original proposal creates such an environment. Given the fundamental problems associated with deriving an optimum cost solution utilising individually submitted response energy prices, we do not believe that the CAP107 original proposal would lead to more efficient response procurement. The lack of the necessary pre requisite market components, would increase prices beyond that which is efficient and cause costs to the industry to rise

11.13.2 However, National Grid does support WGAA B Redefinition of REP Use of Market Index Price per Settlement Period as better facilitating the Applicable Objectives, and also believes WGAA A better facilitates the Applicable Objectives, albeit to a lesser extent than WGAA B

11.13.3 We set out below in more detail our concerns with the Original Proposal in the context of the System Operators ability to optimise, Operational Consequences, Financial risks to providers and Effective Competition. Within these areas, we also seek to highlight why WGG A and WGG B both significantly mitigate many of our concerns, and hence better facilitate the Applicable Objectives.

11.14 Applicable Objectives

11.14.1 Although the objectives of the Original Proposal, closer to real time pricing and cost reflectivity, are supported in principle, we do not believe the later will be achieved through this Amendment and consequently we believe it will lead to a retrograde step in the facilitation of objective A, The efficient discharge by the licensee of the obligations imposed upon it under the Act and by this licence.

11.14.2 Neither will it better facilitate CUSC objective B, facilitating effective competition in generation and supply of electricity and facilitating such competition in the sale, distribution and purchase of electricity in that it does not establish a competitive environment where the declared price will be the arbiter of the trade.

11.15 System Operator Ability to Optimise

11.15.1 Instructions to provide mandatory frequency response obligate the provider, where plant characteristics and declared dynamics make it feasible, to simultaneously be able to provide both high and low response. As it is not possible to predict the net effect on energy delivery in each half hour it is not possible, under the original proposal, to determine whether the price, and hence the cost to the market, is economically and efficiently incurred or significantly out of cost order.

- 11.15.2 National Grid believes that the Original CAP107 proposal would not only result in an inability to predict the net change in frequency in a particular half hour, but also to predict the resulting change in output for each response provider caused by the frequency changes within that half hour. It cannot be assumed that the net impact on all providers will be to uniformly alter output in the same direction. Therefore it is necessary to make assumptions on how intra half hour frequency volatility would impact on each providers response capability. In effect the System Operator would need to make a judgement call on the likely pattern of frequency volatility and whether the net effect of that assumed volatility led to an increase or decrease in output for each individual provider. This compounds the complex and unsolvable nature of attempting to determine whether an individually submitted price, or pair of prices, is actually economic or potentially significantly out of merit. Hence, we believe that the Original CAP107 proposal is seriously flawed, and would result in a sub-optimal solution.
- 11.15.3 The optimally dilemma facing the System Operator is further demonstrated by the following example. Let us assume there are two identical power stations exhibiting the same output level. One unit submits a REP price of £20/MWh and the other submits a REP price of £50/MWh. It is not obvious as to which of these providers the System Operator should instruct, given that it is not possible to tell whether the net change in unit delivered energy will be to increase or decrease output. If the System Operator takes an incorrect view on likely changes in frequency the opportunity cost to the Industry could be £30/MWh. It would be incorrect to assume that the optimal despatch decision in this situation would be to choose the £20/MWh price. In the event that the net output of the provider is reduced the response provider pays £20/MWh. It is important to note that this cash flow recovery of high frequency response is netted out with all the other costs of System Operation and the net position charged out to the industry in the form of BSUoS charges. By choosing the 20/MWh price in this scenario the System Operator would be acting inefficiently and the market would be paying more in BSUoS charges as a consequence of that inability to optimise the response despatch solution.
- 11.15.4 We would also like to highlight that the estimated IS costs associated with the Original are £600k, which significantly exceeds the potential cost of £5K associated with WGAA A and the £45K associated with WGAA B. In our view, particularly given the sub-optimal nature of the original proposal, we would question whether these costs are necessarily compatible with the Applicable Objectives in relation to modification proposals being economic and efficient.
- 11.15.5 WGAA B removes this uncertainty element from any response despatch solution. It provides an appropriate incentive to provide response whilst allowing the System Operator the ability to continue to optimise response despatch and so minimise industry costs.

11.16 Operational Consequences

- 11.16.1 As National Grid seeks to avoid uneconomic response energy prices the original proposal could result in a significant churn of response holding from one half-hour to the next. System Security implications would necessitate the introduction of processes, or even complex automatic systems to ensure frequency response instructions were cancelled before the start of any half-hours when the response energy price exceeded a threshold. The systems' changes would have to apply to both the main and the contingency systems

(note that at present the contingency system contains no frequency response contract information or advice).

- 11.16.2 There will be a particular issue of having insufficient actual frequency response around the half-hour transition as some units will have been instructed off response and others have yet to commence provision. In many respects, half-hour transitions are when frequency response provision is most needed as demand often changes significantly due to price changes or the ending of television programmes. To mitigate against this, National Grid will have to hold more frequency response than currently and this will be at prices above the current Holding marginal price, another factor that would be likely to increase costs if the Amendment Proposal in its original form was implemented. E.g. the frequency response requirement may be 10 units, but during the transition from one generator to another we would hold and pay for 10 units from the generator 'coming off' and 10 units from the generator 'coming on'. In addition and as a consequence it would result in flexing generators loading position to achieve the required response.
- 11.16.3 Both WAA A & B would avoid the risk of performing this inter half hour transitional routine and as a consequence the likely risk to plant and to the transmission system is diminished.

11.17 Financial risks to providers

- 11.17.1 One respondent noted concern under the current regime whereby providers may be disadvantaged if their operating characteristics only allowed the provision of high frequency response with the resulting REP cost exceeding the variable cost of their generation.
- 11.17.2 By the same token a provider is able, through the manipulation of MEL and SEL, variables which can be resubmitted by providers within gate timescales, to exclude themselves from one type of response provision that may be less attractive given the nature of the single price submission. Appropriate dual prices, as proposed in WGAA B, would reduce the incentive for participants to reposition their units to remove themselves from any one type of response. Separate prices to reflect the possibly differing cost of generating and benefit of reduced output, whilst not a perfect reflection of individual providers costs, would still be likely to be an attractive incentive to provide both types of response.
- 11.17.3 WGAA B also addresses the concern of closer to real time pricing identified by the proposal. The nature of this alternative is to link the REP to a market price index. This will enable greater correlation with the current market valuation of electricity and removes the perceived volatility associated with the indexing of the REP with imbalance prices as proposed by WGAA A.

11.18 Effective Competition

- 11.18.1 It is not only the ability of a provider to better reflect their individual energy costs that will drive competition, and the consequential efficient utilisation of services, but also the ability of the purchaser to take account of this pricing information when determining their most efficient procurement strategy. Given the inability for the System Operator to utilise this information the incentive for REP prices to demonstrate cost reflectivity is diminished and the opportunity to pursue other pricing strategies very real.
- 11.18.2 Depending on how participants' pricing strategies change, and in turn National Grid's own dispatch behaviour, there is potential for some

generators to benefit to a greater extent than others. There is a possibility that these greater benefits may be derived as much by the System Operators inability to switch to an alternative provider in sufficient timescales, given a change in submitted prices, as they will due to submitted competitive prices.

- 11.18.3 WGAA B addresses most of the concerns expressed in the original proposal. Whilst not affording providers the ability to self price it does guard against the cost exposure that may be incurred through the provision of only high frequency response. It addresses the concerns in relation to the issue of closer to real time pricing and it addresses the operational and industry cost concerns expressed by the System Operator and members of the industry in relation to the original proposal.

12.0 AMENDMENT PANEL RECOMMENDATION

- 12.1 The CUSC Amendments Panel Recommendation Vote on CAP107 was conducted at the Panel Meeting on 28th July 2006. On the question of whether CAP107 would BETTER facilitate achievement of the Applicable CUSC Objectives, the Panel vote was as follows:

CAP107 Original	- No	- equal split for and against
CAP107 WGAA	- Yes	- unanimous
CAP107 WGAB	- Yes	- unanimous

- 12.2 The Panel unanimously recommends that CAP107 Working Group Alternative B would BEST facilitate achievement of the Applicable CUSC Objectives.

Original Amendment Proposal

- 12.3 All Panel Members who voted in favour of the Original Amendment believed it would better facilitate Applicable Objective (a) by increasing efficiency. However, they raised concerns regarding the proposed implementation date, and the belief of such Panel Members that this detracted from the benefits of the amendment triggered a detailed debate (see section 6 of this report).
- 12.4 In addition, two Panel members also believed the Original Amendment would better facilitate Applicable Objective (b) by removing risk from Generators to National Grid, who they believe are in a better position to manage such a risk, therefore facilitating competition.
- 12.5 Two of the Panel Members who voted against the Original Amendment believed it could not better the Applicable Objectives as National Grid would be unable to optimise, and therefore was not a feasible solution.
- 12.6 In addition, a majority of the Panel Members who voted against the Original Amendment believed, based upon the Working Group discussions, Consultation report and Amendment report, that it was unclear as to whether the original better facilitated the Applicable Objectives. Due to this uncertainty they could not positively state that it did better facilitate the objectives.

Working Group Amendment A

- 12.7 The Panel voted unanimously that Working Group Amendment A did better facilitate the Applicable Objectives and provided a better solution than the current baseline on the ground of efficiency. However, two Panel Members expressed concern regarding the volatility Generators would be exposed to as a consequence of using SBP & SSP parameters.

Working Group Amendment B

- 12.8 The Panel voted unanimously that Working Group Amendment B did better the Applicable Objectives and provided a better solution than the current baseline on the ground of efficiency. In addition, two Panel Members believed Working Group Amendment B would also, but to a lesser extent, better facilitate Applicable Objective (b).

Panel Recommendation as to which proposal “best” facilitated the applicable objectives

- 12.9 The Panel voted unanimously that Working Group Amendment B did best facilitate Applicable CUSC Objective (a) on the grounds of efficiency. Two Panel Members believed it would also, but to a lesser extent, better facilitate Applicable Objective (b), as risk would be transferred from Generators.
- 12.10 Two Panel Members who voted for the Original Amendment as better facilitating the Applicable Objectives believed that the Original Amendment was theoretically a better solution compared to Working Group Amendment B but that Working Group Amendment B was a better solution based on efficiency and CUSC Applicable Objective (a).

13.0 NATIONAL GRID RECOMMENDATION

- 13.1 National Grid supports WGAA B. This alternative addresses most of the concerns expressed in the original proposal. Whilst not affording providers the ability to self price it does guard against the cost exposure that may be incurred through the provision of only high frequency response. It addresses the concerns in relation to the issue of closer to real time pricing and it addresses the operational and industry concerns over costs expressed by the System Operator and members of the industry in relation to the original proposal. It is the best, most pragmatic solution to the issues raised in the proposal and as such better facilitates CUSC objective A, The efficient discharge by the licensee of the obligations imposed upon it under the Act and by this licence.
- 13.2 National Grid also believes that WGAA A is an improvement on the current baseline but to a lesser extent than WGAA B

14.0 COMMENTS ON DRAFT AMENDMENT REPORT

14.1 National Grid received 2 responses following the publication of the draft Amendment Report. The following table provides an overview of each representation. Copies of the representations are attached as Annex 4.

Reference	Company	Summary of Comments
CAP107-AR-01	EDF Energy	Requested consistency in how the company name EDF Energy appeared within the Report and an extra sentence adding to the supporting of WGAA B
CAP107-AR-01	E.ON	The first sentence of para 11.11.1 needed re-wording. 11.17.2 – change “there” to “their”. Title to Annex 2 – change “PROPOSED” to “PROPOSED”.

14.2 National Grid received no responses following the publication of the draft Amendment Report to the Amendments Panel including the Amendments Panel Recommendation Vote.

ANNEX 1 – PROPOSED LEGAL TEXT TO MODIFY THE CUSC**Part A - Text to give effect to the Original Proposed Amendment***Payment Formulae – Response Energy Payment*

4.1.3.9A (a) The **Response Energy Payments** for **BM Unit i** in **Settlement Period j** to be made by **The Company** to a **User** referred to in Paragraph 4.1.3.8 shall be calculated in accordance with the following formulae:-

$$REP_{ij} = RE_{ij} \times \text{Reference Price}$$

But so that where REP_{ij} is negative such amount shall be paid by the **User** to **The Company**.

Where:

REP_{ij} is the **Response Energy Payment** to be made to or, as the case may be, by the User; and

RE_{ij} is the expected response energy for **BM Unit i** in **Settlement Period j** calculated as follows:-

$$RE_{ij} = \int_0^{SPD} \left[\max(FR_{ij}(t), 0) \times (1 - SF_{LF}) + \min(FR_{ij}(t), 0) \times (1 - SF_H) \right] \times K_T \times K_{GRC} dt$$

Where:

$\int_0^{SPD} dt$ is the integral at times t , over the **Settlement Period** duration.

SF_{LF} is equal to SF_P in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response** or the mean of SF_P and SF_S in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**.

SF_P , SF_S , SF_H , K_T and K_{GRC} have the meanings ascribed to them in Paragraph 4.1.3.9.

$FR_{ij}(t)$ is the expected change in **Active Power** output for **BM Unit i**, at time t (resolved to the nearest integer minute), expressed in MW derived from the relevant **Frequency Response Power Delivery Data** table in the **Mandatory Services Agreement** (as such table is interpreted in accordance with Paragraph 4.1.3.11) by reference to the level of **De-Load** of the **BM Unit** concerned at the end of the minute and the mean **Frequency Deviation** over that minute when that **BM Unit** is

providing **Mode A Frequency Response** and zero at all other times.

For this purpose:-

- (i) for a positive **Frequency Deviation** the expected change in **Active Power** output of **BM Unit i** shall be derived from the table entitled "**High Frequency Response Power Delivery – Mode A**" set out in the **Mandatory Services Agreement** and shall be signed negative; and
- (ii) for a negative **Frequency Deviation**, the expected change in **Active Power** output of **BM Unit i** shall be derived from:
 - A) the table entitled "Primary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response**; or
 - B) the table entitled "Primary and Secondary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**,

in each case set out in the **Mandatory Services Agreement** and shall be signed positive.

Reference Price = PO_{ij}^{-1}

Deleted: reference price = $\frac{SBP_{month} + SSP_{month}}{2}$

Where:

- (b) In this Paragraph 4.1.3.9A, the following terms shall have the meanings ascribed to them in the **Balancing and Settlement Code**:-

" PO_{ij}^{-1} "
"SPD"

Deleted: SBP_{month} and SSP_{month} are the calculated time weighted average of SBP_j and SSP_j respectively for the preceding calendar month in which the service is provided

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" SBP_j "¶

Part B - Text to give effect to the Working Group Alternative Amendment A

Payment Formulae – **Response Energy Payment**

4.1.3.9A (a) The **Response Energy Payments** for **BM Unit i** in **Settlement Period j** to be made by **The Company** to a **User** referred to in Paragraph 4.1.3.8 shall be calculated in accordance with the following formulae:-

$$REP_{ij} = RE_{ij} \times \text{Reference Price}$$

But so that where REP_{ij} is negative such amount shall be paid by the **User** to **The Company**.

Where:

REP_{ij} is the **Response Energy Payment** to be made to or, as the case may be, by the **User**; and

RE_{ij} is the expected response energy for **BM Unit i** in **Settlement Period j** calculated as follows:-

$$RE_{ij} = \int_0^{SPD} \left[\max(FR_{ij}(t), 0) \times (1 - SF_{LF}) + \min(FR_{ij}(t), 0) \times (1 - SF_H) \right] \times K_T \times K_{GRC} dt$$

Where:

$\int_0^{SPD} dt$ is the integral at times t , over the **Settlement Period** duration.

SF_{LF} is equal to SF_P in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response** or the mean of SF_P and SF_S in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**.

SF_P , SF_S , SF_H , K_T and K_{GRC} have the meanings ascribed to them in Paragraph 4.1.3.9.

$FR_{ij}(t)$ is the expected change in **Active Power** output for **BM Unit i**, at time t (resolved to the nearest integer minute), expressed in MW derived from the relevant **Frequency Response Power Delivery Data** table in the **Mandatory Services Agreement** (as such table is interpreted in accordance with Paragraph 4.1.3.11) by reference to the level of **De-Load** of the **BM Unit** concerned at the end of the minute and the mean **Frequency Deviation** over that minute when that **BM Unit** is

providing **Mode A Frequency Response** and zero at all other times.

For this purpose:-

- (iii) for a positive **Frequency Deviation** the expected change in **Active Power** output of **BM Unit i** shall be derived from the table entitled "**High Frequency Response Power Delivery – Mode A**" set out in the **Mandatory Services Agreement** and shall be signed negative; and
- (iv) for a negative **Frequency Deviation**, the expected change in **Active Power** output of **BM Unit i** shall be derived from:
 - C) the table entitled "Primary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response**; or
 - D) the table entitled "Primary and Secondary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**,

in each case set out in the **Mandatory Services Agreement** and shall be signed positive.

Reference Price =

Deleted: reference price =

Where:

RE_{ij} is positive then shall equal SBP_j.

RE_{ij} is negative then shall equal SSP_j

Where SBP_j or SSP_j is signed negative and continues to be signed negative after the Determination of Energy Imbalance Prices in accordance with Section T paragraph 4.4 of the Balancing and Settlement Code (as amended) then it shall be zero.

(b) In this Paragraph 4.1.3.9A, the following terms shall have the meanings ascribed to them in the **Balancing and Settlement Code**:-

- “SSP_j”
- “SBP_j”
- “SPD”

Deleted: SBP_{month} and SSP_{month} are the calculated time weighted average of SBP_j and SSP_j respectively for the preceding calendar month in which the service is provided.¶

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Part C - Text to give effect to the Working Group Alternative Amendment B

Payment Formulae – Response Energy Payment

4.1.3.9A (a) The **Response Energy Payments** for **BM Unit i** in **Settlement Period j** to be made by **The Company** to a **User** referred to in Paragraph 4.1.3.8 shall be calculated in accordance with the following formulae:-

$$REP_{ij} = RE_{ij} \times \text{Reference Price}$$

But so that where REP_{ij} is negative such amount shall be paid by the **User** to **The Company**.

Where:

REP_{ij} is the **Response Energy Payment** to be made to or, as the case may be, by the **User**; and

RE_{ij} is the expected response energy for **BM Unit i** in **Settlement Period j** calculated as follows:-

$$RE_{ij} = \int_0^{SPD} \left[\max(FR_{ij}(t), 0) \times (1 - SF_{LF}) + \min(FR_{ij}(t), 0) \times (1 - SF_H) \right] \times K_T \times K_{GRC} dt$$

Where:

$\int_0^{SPD} dt$ is the integral at times t , over the **Settlement Period** duration.

SF_{LF} is equal to SF_P in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response** or the mean of SF_P and SF_S in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**.

SF_P , SF_S , SF_H , K_T and K_{GRC} have the meanings ascribed to them in Paragraph 4.1.3.9.

$FR_{ij}(t)$ is the expected change in **Active Power** output for **BM Unit i**, at time t (resolved to the nearest integer minute), expressed in MW derived from the relevant **Frequency Response Power Delivery Data** table in the **Mandatory Services Agreement** (as such table is interpreted in accordance with Paragraph 4.1.3.11) by reference to the level of **De-Load** of the **BM Unit** concerned at the end of the minute and the mean **Frequency Deviation** over that minute when that **BM Unit** is providing **Mode A Frequency Response** and zero at all other times.

For this purpose:-

- (v) for a positive **Frequency Deviation** the expected change in **Active Power** output of **BM Unit** i shall be derived from the table entitled “**High Frequency Response Power Delivery – Mode A**” set out in the **Mandatory Services Agreement** and shall be signed negative; and
- (vi) for a negative **Frequency Deviation**, the expected change in **Active Power** output of **BM Unit** i shall be derived from:
 - E) the table entitled “Primary Response Power Delivery – Mode A” in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response**; or
 - F) the table entitled “Primary and Secondary Response Power Delivery – Mode A” in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**,

in each case set out in the **Mandatory Services Agreement** and shall be signed positive.

Where RE_{ij} is positive then:

$$\text{Reference Price} = \max \left(\frac{\sum_s \{PXP_{sj} \times QXP_{sj}\}}{\sum_s \{QXP_{sj}\}} \times 1.25, 0 \right)$$

where \sum_s represents the sum over all **Market Index Data Providers**.

Where RE_{ij} is negative then:

$$\text{Reference Price} = \max \left(\frac{\sum_s \{PXP_{sj} \times QXP_{sj}\}}{\sum_s \{QXP_{sj}\}} \times 0.75, 0 \right)$$

where \sum_s represents the sum over all **Market Index Data Providers**

(b) In this Paragraph 4.1.3.9A, the following terms shall have the meanings ascribed to them in the **Balancing and Settlement Code**:-

- “ PXP_{sj} ”
- “ QXP_{sj} ”
- “SPD”

“**Market Index Data Provider**”

Deleted: $\text{reference price} = \frac{SBP_{month} + SS_{month}}{2}$

Deleted: SBP_{month} and SSP_{month} are the calculated time weighted average of SBP_j and SSP_j respectively for the preceding calendar month in which the service is provided.

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“ SBP_j ”¶

ANNEX 2 – AMENDMENT PROPOSAL FORM

CUSC Amendment Proposal Form	CAP: 107
Title of Amendment Proposal:	
Redefinition of Response Energy Payment (REP) for Mandatory Frequency Response	
Description of the Proposed Amendment (mandatory by proposer):	
A change to the calculation of Response Energy Payment under section 4.1.3.9A of the CUSC so that a generator pays, or is paid, its first Bid Price (PB^1_{ij} under the BSC) for changes in energy output which occur as a result of delivering frequency response.	
Description of Issue or Defect that Proposed Amendment seeks to Address (mandatory by proposer):	
<p>Presently, a generator who provides frequency response under Section 4 of the CUSC is paid a Holding Payment for the ability to provide the service and is paid, or pays, a Response Energy Payment for changes in output which result when the generator actively responds to a change in frequency. The Response Energy is priced at a reference price which is the average of the time weighted average System Buy Price and time weighted average System Sell Price for the preceding calendar month.</p> <p>Given the average and retrospective nature of its calculation and the significantly differing costs of different types of generating unit, this price is unlikely to reflect the true costs that individual generators face. Therefore, there is an incentive for generators to cover the associated risk by increasing the Holding Payment rates. These can only be changed once a month by generators for use in the successive calendar month. Therefore, the level of risk premium has to reflect the uncertainty of the level of usage of the service and the degree of uncertainty as to how an individual BMU's costs will differ from the Reference Price.</p> <p>By paying, or charging, the relevant BMU a price equivalent to its first Bid Price, the generator concerned is able to more closely reflect its actual costs. Clearly, the precise solution would be to pay the generator its Offer Price when the delivery of response results in additional output from the BMU during the relevant period and require it to pay its Bid Price when the response results in reduced output from the BMU. However, we propose that the first Bid Price is used in order to simplify the solution.</p>	
Impact on the CUSC (this should be given where possible):	
We anticipate that this will require a change to Section 4 of the CUSC.	
Impact on Core Industry Documentation (this should be given where possible):	
None anticipated.	
Impact on Computer Systems and Processes used by CUSC Parties (this should be given where possible):	
Not known	

Details of any Related Modifications to Other Industry Codes (where known):

None known.

Justification for Proposed Amendment with Reference to Applicable CUSC Objectives**
(mandatory by proposer):

(a) the efficient discharge by the licensee of the obligations imposed upon it under the Act and by this licence.

National Grid is obliged by its licence to control frequency within the limits specified in the Electricity Supply Regulations. The amendment will allow this obligation to be met more efficiently as Holding Payment rates will not need to be inflated to reflect the risk associated with the present Reference Price.

Details of Proposer: Organisation's Name:	Paul Jones E.ON UK plc
Capacity in which the Amendment is being proposed: (i.e. CUSC Party, BSC Party or "energywatch")	CUSC Party
Details of Proposer's Representative: Name: Organisation: Telephone Number: Email Address:	<i>Paul Jones</i> <i>E.ON UK plc</i> <i>024 7642 4829</i> paul.jones@eon-uk.com
Details of Representative's Alternate: Name: Organisation: Telephone Number: Email Address:	Claire Maxim <i>E.ON UK plc</i> <i>024 7642 5378</i> claire.maxim@eon-uk.com
Attachments:	No

ANNEX 3 – REPRESENTATIONS RECEIVED DURING CONSULTATION

This Annex includes copies of any representations received following circulation of the Consultation Document (circulated on 23rd May 2006, requesting comments by close of business on 20th June 2006).

Representations were received from the following parties:

No.	Company	File Number
1	British Energy	CAP107-CR-01
2	EDF Energy	CAP107-CR-02
3	RWE	CAP107-CR-03
4	First Hydro / International Power	CAP107-CR-04
5	Gaz de France	CAP107-CR-05
6	E.ON UK	CAP107-CR-06
7	For and on behalf of: Scottish and Southern Energy, Southern Electric, Keadby Generation Ltd., Medway Power Ltd., SSE Generation Limited and SSE Energy Supply Ltd.	CAP107-CR-07

Reference	CAP107-CR-01
Company	British Energy



Beverley Viney
Electricity Codes
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

20th June 2006

Dear Beverly

CAP107 redefinition of Response Energy Payment (REP) for Mandatory Frequency Response

British Energy welcomes the opportunity to comment on the above consultation.

BE are surprised that with the introduction of CAP047 being less than 12 months ago that this amendment is looking to change frequency response payments again! Surely, CAP047 should be allowed to "bed in" before any major changes are considered. We are also concerned that one of the defects this is designed to correct is reduction in holding payments. None of the proposed amendments place incentives on service providers to reduce holding payments. Thus there is the distinct possibility of continuing high holding payments in addition to increased response payments.

We therefore consider that none of the amendments better facilitates the Applicable CUSC objectives when compared to the current baseline. However, if a change had to be made to REP then BE believe that WGAA B would be the preferred option.

CAP107 Original

BE do not believe that CAP107 original better meets the CUSC objectives. As NG have noted in the consultation document this amendment would have the effect of introducing significant sub-optimality in the frequency response dispatch decision making process. The sub-optimality will result in inefficient and uneconomic actions resulting in greater costs to the industry.

CAP107 WGAA A

BE believe that while this alternative amendment meets the CUSC objective WGAA B is a preferred option as it is less volatile.

CAP 107 WGAA B

British Energy plc Barnett Way Barnwood Gloucester GL4 3RS

Telephone 01452 652222 Facsimile 01452 653246
Registered at 3 Redwood Crescent Peel Park East Kilbride G74 5PR Registered Number 162273

BE believe that if there has to be a change that WGAA B is its preferred option. This alternative results in a more accurate payment for response energy and it uses prices closer to real time when compared to the other alternatives. It also maintains a common response price for all generators thus removing the risk of sub optimal response despatch, and the high costs risk associated with individual generator submitted high prices.

Finally, BE would reiterate that we do not believe that the current arrangements have had sufficient time to "Bed In" and should be left for at least another winter. If a change has to be made then BE believe that it should be WGAA B, which is the less volatile of the options available.

If you wish to discuss these matters further please do not hesitate to contact me.

Yours Sincerely

Rachel Lockley

**Trading Consultant
British Energy Power and Energy Trading**

 01452 652972
 rachel.lockley@british-energy.com

Reference	CAP107-CR-02
Company	EDF Energy

Beverley Viney
Amendments Panel Secretary
Electricity Codes
National Grid [National Grid House]
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA



08 June 2006

Dear Beverley,

CUSC amendment proposal CAP107: Redefinition of Response Energy Payment (REP) for Mandatory Frequency Response

EDF Energy is pleased to have the opportunity to comment on the CUSC amendment proposal, CAP107.

We note that frequency response is a valuable generator to system operator service that needs to be mandatory and requires a clear commercial framework to recover costs associated with complying with the mandate. We believe that a fair, cost reflective REP system is needed to ensure that CUSC objective (a) is met and that (b) is not compromised by any manipulation of the system.

EDF Energy considers that the current REP system, whereby the preceding month's SBP and SSPs are used to price the REP payments is not ideal, as it forces some generators to consider including a premium in holding prices to cover their exposure to cashout prices. We agree with the working group that the design of the REP system can influence holding prices that are submitted and the availability of plant to a necessary, mandatory service. Therefore we are satisfied that the REP system of payments should be changed through this CUSC amendment proposal.

We believe that the working group alternative amendment, WGAA B - Redefinition of REP Use of Market Index Price per Settlement Period is the most suitable amendment of the three proposals for the reasons described below.

- We note the increased complexity for National Grid to optimise the procurement of frequency response under the original proposal and the associated costs and implementation timescales. Although we consider a market-based pricing system, whereby providers can submit individual prices for response energy, to be an ideal solution, we are not convinced that the benefits of such arrangements would justify the costs of implementing this. We therefore believe that although this does better facilitate CUSC objective b, it does not better facilitate CUSC objective a.
- The second proposal, WGAA A, which uses the imbalance SBP and SSP prices per settlement period, may well lead to greater volatility in REP payments received or made by generators. This would make the defect identified with

 <p>EDF Energy 40 Grosvenor Place Victoria London SW1X 7EN</p>	<p>Tel +44 (0) 20 7752 2524</p>	<p>edfenergy.com</p>
<p>EDF Energy plc. Registered in England and Wales. Registered No. 2366552. Registered Office: 40 Grosvenor Place, Victoria, London, SW1X 7EN</p>		



the present system worse. Although the analysis indicated that the overall system costs would be slightly negative (as they are presently), this may not be the case for individual parties providing frequency response. We also consider that it is inappropriate for the REP payments to be linked to imbalance prices that can be changed at any time by modifications to the BSC. Approved BSC modification 194 is likely to lead to increased volatility in SBP and SSPs, thus making the volatility of REP payments more of an issue. In turn this may cause providers to increase their holding prices, particularly for High frequency response.

In summary, we consider that the proposal WGAA B, Redefinition of REP Use of Market Index Price per Settlement Period is a suitable amendment to the CUSC, replacing the current system for establishing REP payments to generators as it:

- should address the defect identified by the original proposal in providing more stable prices than the imbalance prices;
- that both CUSC objectives are fulfilled by the WGAA B REP payments system, without adversely affecting the system for establishing holding payments;
- the CUSC objective (a) should be fulfilled through all payments being established on the same price, which should provide efficient dispatch optimisation by National Grid;
- the CUSC objective (b) should be fulfilled through the REP prices being more reflective of the value of energy in the period, encouraging participants to enter into the frequency response service in a more competitive manner;
- should better reflect the spread between the marginal costs of providing primary/secondary response and high frequency response therefore allowing providers to submit more competitive holding prices for all three types of frequency response.

We hope that you will find these comments helpful.

If you have any queries please do not hesitate to contact David Scott on the number below.

Yours sincerely,

Jim Beynon
Energy Market Strategy

Reference	CAP107-CR-03
Company	RWE

RWE npower



Ms B Viney
Electricity Codes
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

Name Raoul Thulin
Phone 01793 892634
Fax 01793 892167
E-Mail raoul.thulin@rwe.com

20th June 2006

■ Dear Ms Viney

**CONSULTATION DOCUMENT - CUSC AMENDMENT PROPOSAL CAP107
REDEFINITION OF RESPONSE ENERGY PAYMENT (REP) FOR MANDATORY FREQUENCY
RESPONSE**

Thank you for the opportunity to comment on the above consultation. The following comments are provided on behalf of RWE Npower plc, Npower Cogen Limited, Npower Cogen Trading Limited, Npower Direct Limited, Npower Limited, Npower Northern Limited, Npower Northern Supply Limited, Npower Yorkshire Limited, Npower Yorkshire Supply Limited.

The frequency response energy payment in its current form has long been recognised as an issue that has led to gains and losses for different providers of mandatory frequency response at different times. Indeed, the matter was the subject of one of the first CUSC amendment proposals (CAP010). Following the rejection of CAP010, the matter was the subject of much discussion in the Balancing Services Standing Group (BSSG), although no amendment proposals were raised while other matters relating to the service (e.g. CAP047) were addressed.

CAP107 offers a novel solution to the problem of pricing the energy delivered when providing the service of frequency response. Whilst allowing the provider to submit prices themselves, the use of the Offer Price -1 puts certain limits on what may be submitted due to the rules that govern the Bid/Offer ladder. For example, the Offer Price -1 must be less than or equal to the Offer Price +1, which is the price for delivering energy above a unit's PN in the Balancing Mechanism (BM). Also, it must be greater than or equal to the Bid Price -1, which is the price a provider will pay to the System Operator (SO) for turning down below the PN. Therefore, for an active and competitive participant in the BM, it should be broadly reflective of the marginal cost of generation. Also, because of the nature of response provision, there is a natural protection against providers submitting extreme prices since they may be exposed to having to pay this price for High Frequency response energy.

The current payment for frequency response energy is generally regarded to lead to the inefficient pricing of holding payments. This arises mainly from the legitimate concern of providers that they may at times be called to provide only High Frequency

RWE npower
Trigonos
Windmill Hill Business
Park
Whitehill Way
Swindon
Wiltshire SN5 6PB
T +44(0)1793/87 77 77
F +44(0)1793/89 25 25
I www.rwenpower.com

Registered office:
RWE Npower plc
Windmill Hill Business
Park
Whitehill Way
Swindon
Wiltshire SN5 6PB
Registered in England
and Wales no. 3892782

response when at full load and that this will result in payments for the energy to the SO that are in excess of the value of the fuel saved by de-loading. Thus, there has been a marked increase in High Frequency response prices in particular over recent months in order for such costs to be recovered. However, since a provider cannot predict how it will be instructed at the time when holding prices are submitted, this may lead to holding prices being higher than they need be and thus to inefficient pricing. Allowing a provider to determine the price of the energy would allow for more efficient pricing of the holding payments, since potential losses from delivering energy would no longer be a cause for concern.

In terms of balancing the system, the energy delivered as a result of the provision of frequency response is only different from energy delivered through the BM in that it is delivered automatically and is therefore not under the direct control of the SO. This difference ought not to mean that a provider should be exposed to a potential loss whenever response energy is provided. It is the inability to control the energy delivered as a result of providing frequency response that appears to be the main cause for concern for National Grid and that leads to their preference for an administered pricing arrangement. However, the wide range of costs of production as between different providers means that administered prices will never meet all providers' requirements. It is worth noting that the individual costs faced will depend not only on fuel type, but on efficiency, the sulphur content of fuel, the type of contract under which fuel is procured etc. etc..

To address the specific questions in the consultation document:

- 1 We believe that CAP107 does better facilitate the CUSC objectives by removing the inevitable inefficiency arising from the current arrangements. It would also promote competition between providers of frequency response since the pricing structure could properly reflect costs where they occur rather than pricing the holding payments so as to avoid losses related to energy delivery.
- 2 The benefit of the change to the energy pricing arrangements ought to be that providers are able to ignore the energy price when setting their holding payments. Thus, the less volatile option of WGAA B better facilitates the efficient working of the frequency response arrangements. However, potentially high market prices may still result in concern over losses being incurred when delivering High Frequency response energy.
- 3 By allowing the provider to set the price of the energy by the mechanism described in the original proposal, they would be able to react to changing costs and therefore would be in the best position to ignore the energy price in their determination of the holding prices. For this reason, we consider that the original proposal best facilitates the CUSC objectives.
- 4 We do not share National grid's concerns over sub-optimality. This concern seems to derive from a very narrow interpretation of efficiency and optimality. Currently, holding prices will inevitably reflect the risk of losses incurred through the provision of response energy. Although allowing the SO to ignore energy prices, the current arrangements impose inefficiency in holding prices, which is a direct cost to the industry. Whilst we recognise that the individual pricing of the energy from providers means that the SO must use statistical tools to optimise the instruction of responsive plant, we consider that National Grid are over-stating the issue. All participants in the industry are used to using risk control techniques to optimise their position in an uncertain market. The SO could not be expected to demonstrate that the dispatch of plant was optimal during every settlement period in hindsight, but would be expected to be able to demonstrate that they had used appropriate techniques to select the appropriate providers.

This type of approach is familiar to National Grid in, for example, the procurement of Standing Reserve. During the assessment of Standing Reserve tenders, part of the analysis is based on the expected running hours of the tendered unit. If the actual utilisation of a contracted unit turns out to be less than had been expected, then a narrow interpretation of optimality could lead one to conclude that the decision to contract with that unit was inefficient. However, as long as the decision was based on sound principles, then it is accepted that such contracts may not necessarily appear economic in hindsight in every case although, in the long run, they offer an efficient means of securing the system against unforeseen events.

The concern expressed about the potential to change prices near to real time should be mitigated by the fact that submitted prices are seen by the SO an hour ahead of real time and should therefore give the SO sufficient time to manage the transition between periods where prices change. However, we would not anticipate that prices would change very frequently to the extent envisaged by National Grid.

- 5 The proposed implementation timescales for the original proposal appear extremely long and potentially impact on the benefits of the amendment. Our suggested approach would be to derive an expected energy delivery volume at each de-load point, which when applied to the energy price, could be used as an addition (positive or negative) to the holding prices for that unit. The optimisation process would then be identical to that currently employed.
- 6 We agree with the legal drafting for the original and for the alternative proposals.

I trust you will find the above comments helpful. If you wish to discuss any matters further, please do not hesitate to contact me.

Yours sincerely

Raoul Thulin
Ancillary Services Manager

Reference	CAP107-CR-04
Company	First Hydro / International Power



International Power Plc
Bala House
St. David's Park
Deeside
Flintshire
CH5 3XJ

20th June 2006

Beverly.Viney@uk.ngrid.com

Beverly Viney
Electricity Codes
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

Dear Beverley,

CAP 107 - Redefinition of Response Energy Payment for Mandatory Frequency Response

Thank you for the opportunity to comment on CUSC Amendment Proposal CAP107. This response is submitted on behalf of International Power's operating companies in the UK: First Hydro Company; Rugeley Power Ltd; Deeside Power Development Company Ltd; and Saltend Cogeneration Company Ltd. Our views on the three alternatives detailed in the consultation document are summarised below.

Original Proposal

This proposal allows the generator to indicate the price for frequency response energy payment on a half hour basis by using the -1 Offer price. This would allow generators with different fuel cost to indicate different prices for each half hour.

The half-hourly flexibility for the generator that is inherent in this option will inevitably cause NGET significant implementation issues as they will need to dynamically consider the energy price (as well as the holding price) in the frequency despatch algorithm.

Currently as all generators receive the same level of compensation for response energy this does not need to be factored in. The significant lead time for developing this algorithm and the practical issues of re-despatching frequency response across units on a half hour basis lead us to believe that although this solution better meets some CUSC objectives it does not provide a realistic way forward. It may also lead to inefficient despatch, potentially re-despatching, or cycling, on a half hour basis.

Furthermore, we do not support the idea of utilising a Balancing Mechanism offer pricing parameter for the purposes of pricing response energy payment. There is the potential

for pricing distortions where a single parameter is required to cover two different purposes.

Therefore International Power does not support the Original Proposal.

WGAA A:- Re-definition of REP Use of Imbalance Price

This alternative replaces the current definition of REP (based on the previous months average SBP+SSP) with SBP and SSP for the relevant half hour.

This solution improves on the current position by ensuring that the energy payments for delivering additional energy are targeted to the half hour when the imbalance occurs and provides a different energy payment for high and low frequency energy. Thus a unit running base load providing only high frequency response will pay back SSP whilst a generator providing additional energy will receive SBP. This clearly improves cost-reflectivity in terms of the prevailing value of balancing energy, close to real time. In addition, the changes to NGETs despatch algorithm will be relatively simple as all generators continue to be paid/pay the same amount for delivery of the energy.

However, the main drawback relating to this proposal is the potential volatility of SBP and SSP. Whilst in general it will ensure that providers of high frequency response do not pay back more in energy payments than their avoided fuel cost, as is currently the case, this position is subject to erratic cashout pricing. Despite extensive tagging in the cashout pricing calculations, constraint and other system-related actions still have the potential to influence SBP and SSP. This may distort response energy payments under this alternative.

Whilst we believe that this alternative better meets the applicable CUSC objectives, and improves on the Original Proposal, WGAA B is the preferred approach.

WGAA B:- Re-definition of REP Use of Market Index Price

This improves on WGAA A by replacing the SBP with (Market Index Price x 1.25) and SSP with (MIP x 0.75.) This reduces the volatility created by using SBP and SSP as the energy price is based primarily on traded prices rather than Balancing Mechanism prices. It continues to have simplicity from NGETs perspective in the despatch environment where few if any changes need to be made to the implementation algorithm. We concur with the estimates made in terms of industry implementation.

Improved real-time pricing will support more appropriate cost-reflectivity in the provision of frequency response, and the spread in price between high and low frequency response energy should ensure that fuel price risks are much reduced compared with the current arrangements.

The choice of sharing factors creates a proxy for imbalance prices, which coincidentally delivers reasonable cost-neutrality for NGET. These may need to be reviewed if pricing patterns change – however we would expect the relationship between cashout prices and market prices to remain reasonably consistent, even following the implementation of P198 in the B&SC environment.

Conclusions

Of the three proposed solutions, International Power supports the second Working Group Alternative (WGAA B:-Re-definition of REP Use of Market Index Price). We believe that this better meets the CUSC objectives than the current arrangements, and amongst the three options presented it best facilitates those objectives. We have no comments on the legal drafting.

Yours sincerely

Simon Lord
Transmission Services Manager

Reference	CAP107-CR-05
Company	Gaz de France



16 June 2006

Beverley Viney
Electricity Codes
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

GAZ DE FRANCE ESS (UK)
LTD

1 City Walk
Leeds
LS11 9DX
United Kingdom

tel: +44 (0)113 306 2000
fax: +44 (0)113 245 1515

www.gazdefrance.co.uk

REGISTERED IN ENGLAND
NO. 2706333

Dear Beverley

Re: CAP 107 (Redefinition of Response Energy Payment (REP) for Mandatory Frequency Response

Thank you for the opportunity to comment on the above.

Gaz de France ESS agrees that a redefinition of the response energy price is necessary in the wake of CAP 047, and supports the move to a REP that is closer to the real-time costs of providing mandatory frequency response.

Specifically, Gaz de France ESS supports Working Group Alternative Amendment (WGAA) B for the following reasons:

- We are in favour of moving to a REP based upon real-time market prices in the half-hour that the response was provided.
- WGAA B is more cost effective and practical to implement than the original proposal.
- Use of Market Index Price avoids the exposure of generators to extremes in the spread between System Buy and System Sell Price implied by WGAA A.

Gaz de France ESS has noted the implementation timescales in the consultation document. We have no comments on the legal text.

Please contact me should you have any queries about this response.

Yours sincerely

Colin Paine
Generation Manager

Reference	CAP107-CR-06
Company	E.ON UK



Beverly Viney
Amendments Panel Secretary, Electricity Codes
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

E.ON UK plc
Westwood Way
Westwood Business Park
Coventry
CV4 8LG
eon-uk.com

Paul Jones
024 7642 4829
paul.jones@eon-uk.com

16 June, 2006

Dear Beverley,

CAP107 – Redefinition of Response Energy Payment (REP) for Mandatory Frequency Response

Thank you for the opportunity to respond to the above amendment consultation. As the party that proposed CAP107, clearly we support its implementation. Our preferred option is the original proposal although we believe that both Working Group Alternative Amendments are suitable alternatives.

The present method for deriving the reference price used in calculating the Response Energy Payment uses a retrospective monthly average of SBP and SSP. When we proposed CAP107 we identified two issues which this causes for generators. Firstly, the average nature of the calculation means that the price cannot reflect the different costs facing different providers of response. Secondly, its retrospective nature means that it cannot reflect the real time position of generators. The only solution at present is for generators to factor these risks into their Holding Payment rates by adding a risk premium.

Original

The original proposal seeks to address both of these issues together. As the price is submitted by the generator for each BMU and can be changed up to gate closure, it is able to reflect its individual costs as accurately as possible. We understand that National

E.ON UK plc
Registered in
England and Wales
No 2366970

Registered Office:
Westwood Way
Westwood Business Park
Coventry CV4 8LG

Grid has concerns that this will increase its risk when instructing generators to provide frequency response. We agree that it will do so. However, at present generators are taking this risk individually and have to manage it from two to six weeks before the relevant period. We believe that National Grid is better placed to manage the risk centrally as it makes decisions on which units to instruct close to real time. We are disappointed however that National Grid's estimated cost and lead times for implementing the original proposal makes it appear less attractive than it could be.

Alternative Amendment WGAA A

This alternative seeks to pay the prevailing SBP for low frequency response, or charge the prevailing SSP for high frequency response, for the half hour in which it is provided. We do not believe that this provides as comprehensive solution as the original, but it is better than the current baseline.

This option addresses one of our two issues with the present reference price in that a price relevant to the period in which the service is delivered is used. Therefore, the prices act as a proxy for the marginal cost of providing the service. However, the difference between individual generators' costs and the relevant imbalance price means that the other of the two risks remains. Consequently, this option provides National Grid with less risk regarding instructing generators to provide the service. Therefore, it has the benefit that it is less costly and quicker to implement than the original.

There was also a concern that this approach could occasionally expose generators to extreme prices especially if SSP is high, as has sometimes been the case historically. It was believed that it would be inequitable to expect a generator to pay such high prices for the provision of a balancing service. We agree that potential volatility is a risk with this option. However, on balance we believe that WGAA A still better meets the applicable objectives than the present baseline.

Alternative Amendment WGAA B

This option was developed in response to the price volatility issue raised in relation to WGAA A and seeks to develop a proxy for SBP and SSP. It does so by multiplying the Market Index Price (MIP), created to set the reverse price imbalance price under the Balancing and Settlement Code, by a fixed percentage. The approach taken was to analyse historic levels of SSP and SBP to determine whether there was any relationship with MIP. This analysis showed that over the last two years SSP and SBP have been around 80% and 120% of MIP respectively. Additional analysis was carried out by National Grid to ascertain the effect this would have had on the cost of historic response usage. This showed that a more appropriate level may be to price SBP and SSP at 125% and 75% of MIP respectively.

We believe that the differences between the two choices are not significant and therefore would support the option chosen for WGAA B of a spread of 25% either side of MIP. An additional reason for choosing this value is that it is more likely to reflect the position post

introduction of P194, which would be expected to increase the volatility and average spread of SBP and SSP. However, we would recommend that this value is periodically reviewed and an amendment can be raised if 25% is no longer found to be representative.

On balance this option has the ability to better meet the relevant objectives than WGAA A due to the removal of some of the volatility risk. However, we do not believe that it is better than the original option.

Ranking of options

In summary, we would rank the options as follows in order of reducing preference.

1. Original Proposal.
2. WGAA B
3. WGAA A

We believe that all better meet the relevant objectives than the current baseline.

Yours sincerely

Paul Jones
Trading Arrangements

Reference	CAP107-CR-07
Company	For and on behalf of: Scottish and Southern Energy, Southern Electric, Keadby Generation Ltd., Medway Power Ltd., SSE Generation Limited and SSE Energy Supply Ltd.

Dear Sirs,

This response is sent on behalf of Scottish and Southern Energy, Southern Electric, Keadby Generation Ltd., Medway Power Ltd., SSE Generation Limited and SSE Energy Supply Ltd.

In relation to the consultation concerning the report associated with CUSC Amendment Proposal CAP107 "Redefinition of Response Energy Payment (REP) For Mandatory Frequency Response" (contained within your note of 23rd May 2005), firstly we wish to apologise for the late submission of this response. This was in part because we were seeking to clarify the definition of "Market Index Data Providers". We appreciate the helpful comments provided by yourselves in this regard and we look forward to the minor clarification to the legal text that will arise.

In regard to the consultation itself we have the following comments to make.

We are mindful that those parties that already operate at the optimum level; i.e. maximising their output to achieve the most efficient output from the plant both economically and environmentally; would be required, in providing mandatory frequency response, to reduce their output by de-loading. Reviewing the CAP107 Original and the two Working Group Alternatives we believe that these parties could be adversely affected by this proposed change.

We therefore conclude that the CAP 107 proposal does not better facilitate the achievement of the Applicable CUSC Objectives, and in particular (b), when compared to the existing baseline version of the CUSC.

Yours Faithfully,

Garth Graham
Scottish and Southern Energy plc

ANNEX 4 - REPRESENTATIONS RECEIVED UPON THE DRAFT AMENDMENT REPORT

This Annex includes copies of any representations received following circulation of the Draft Amendment Report (circulated on 11 July 2006, requesting comments by close of business on 18 July 2006).

Representations were received from the following parties:

No.	Company	File Number
1	EDF Energy	CAP107-AR-01
2	E.ON UK	CAP107-AR-02

Reference	CAP107-AR-1
Company	EDF Energy

Beverley,

EDF Energy is thankful to have the opportunity to review the draft amendment report.

There are two points that I would like to draw to your attention:

That the name of EDF Energy varies throughout the document. Can the company be referred to as EDF Energy in all cases, not EDF or Edf, as this will cause confusion between EDF Energy and EDF Trading, (which are two separate parties)?

Also, I should like to see the following noted in the summary of the EDF Energy response, to further justify the company's supportive position of WGAA B:

The CUSC objective (a) should be fulfilled through all payments being established on the same price, which should provide efficient dispatch optimisation by National Grid

I hope this has been of help.

Regards,

David

Reference	CAP107-AR-2
Company	E.ON UK

Beverley,

I'm basically happy with the draft.

I have just a few suggestions.

1. The first sentence of para 11.11.1 doesn't work at the moment:-

"E.ON are disappointed that National Grid's estimated costs and lead times for implementing the original proposal and believes these make it appear less attractive than it could be."

I would recommend changing it to:-

"E.ON are disappointed that National Grid's estimated costs and lead times for implementing the original proposal make it appear less attractive than it could be."

2. 11.17.2 – change "there" to "their".

3. Title to Annex 2 – change "PROPOSED" to "PROPOSED".

I hope these help.

Cheers

Paul