



SEM TRADING AND SETTLEMENT CODE

**Proposed Credit Cover Parameters
for the First Trading Year**

CONSULTATION PAPER

9 August 2007

AIP/SEM/07/438

Background

The SEM Trading and Settlement Code (TSC) was commenced on 3rd July 2007, when the Framework Agreement was signed by the original signatories.

The TSC specifies that the Market Operator shall make a report to the Regulatory Authorities proposing eight parameters relating to the calculation of Required Credit Cover at least 90 days before the start of the First Trading Year¹. The Regulatory Authorities have now received the Market Operator's report which proposes values for the parameters as shown in the table below, and is included in this paper as appendix 1.

Historical Assessment Period for Billing Period	45 days
Historical Assessment Period for Capacity Period	100 days
Analysis Percentile Parameter	1.96
Credit Cover Adjustment Trigger	15%
Maximum level of the Warning Limit	75%
Fixed Credit Requirement for Supplier Units	€100,000
Fixed Credit Requirement for Generator Units	€10,000
Initial Credit Assessment Price	€102.816
Estimated Capacity Price	€10.18

The Market Operator states in its report that the proposed values are dependent upon the value that the Regulatory Authorities will determine for the Supplier Suspension Delay Period and that it assumes that value will be 20 working days. The Regulatory Authorities note that the value for the Supplier Suspension Delay Period is still under consultation², but will take account of their decision on that parameter when considering the comments and the Market Operator's responses to this consultation. Also published with this consultation are seven spreadsheet models that the Market operator used in developing its proposals.

The purpose of this consultation is to seek views from participants on the Market Operator's proposals.

The Regulatory Authorities welcome all comments on the proposals set out in Appendix 1 of this paper. Comments should be sent, preferably in electronic form, to:

Philip Newsome,
Commission for Energy Regulation,
The Exchange,
Belgard Square North,
Dublin 24

pnewsome@cer.ie

The closing date for comments is Thursday 6th September 2007.

¹ See TSC paragraphs 8.41 and 8.44.

² AIP-SEM-07-427 26 July 2007, closing date 17 August 2007

Next Steps

The Regulatory Authorities will provide all comments received to the Market Operator and will seek its responses to those comments. On the basis of that information and the comments on the consultation, the Regulatory Authorities will reach their decision on the values that should be used for the parameters concerned for the First Trading Year. It is intended that all comments and the Market Operator's responses will be published and it is therefore preferred that any comments received are not indicated to be confidential. Any party that wishes any part of its comments to be kept confidential should clearly indicate which parts of the comments are confidential. Once the Regulatory Authorities have provided their decisions to the Market Operator, the approved values will be provided to the Market Operator and published in accordance with paragraph 6.176 and 8.42 (as applicable) of the TSC.

Appendix 1

SEM Establishment Programme

Title	Parameters for use in Credit Risk Management of SEM
Version	Final Version 1.0
Date	03/07/2007
Author	SEM Establishment Programme

Introduction

The Trading & Settlement Code sets out the rules for the calculation of Required Credit Cover for Participants. The calculation recognises that the Required Credit Cover for each Participant is made up of known and unknown exposures. The known exposure is based on Invoiced amounts and published Settlement values. The unknown exposure, called the Undefined Exposure, is based on statistical analysis of known historical values of Settlement or Pricing. New or Adjusted Participants, those whose historical values of Settlement are unknown or not reflective of current levels of trade, have Required Credit Cover calculated using forecast volumes against Prices calculated from known Prices while Standard Participants have Required Credit Cover calculated using known Settlement values.

In each of these calculations, and in the day to day Credit Risk assessment process, a number of parameters are used. These parameters are as follows –

- Historical Assessment Period for Billing Period – this sets the number of historical days in the past over which the analysis of Trading Payments and Trading Charges will be carried out against;
- Historical Assessment Period for Capacity Period – this sets the number of historical days in the past over which the analysis of Capacity Payments and Capacity Charges will be carried out against;
- Analysis Percentile Parameter – this sets the percentile confidence value in the statistical analysis;
- Credit Cover Adjustment Trigger – a Participant will be classed as an Adjusted Participant under the Code if the Participant's trade volumes increase by a percentage greater than this value.
- Maximum Level of the Warning Limit – this sets the point above which a Participant cannot change their Warning Limit. When the Required Credit Cover to Posted Credit Cover ratio exceeds the Warning Limit, the Participant will be notified. It is proposed that Participants can adjust the limit to meet their own needs but not above a maximum value;
- Fixed Credit Requirement – this sets the value of Required Credit Cover that must be in place for each registered Supplier Unit or Generator Unit in SEM, when the unit is not trading;
- Initial Credit Assessment Price – this is the price to be used for determining Initial Required Credit Cover prior to Market start date; and
- Estimated Capacity Price – this is the estimated value of Capacity Payment Demand Price that will be used as part of the Initial Credit Assessment Price.

Although these parameters are considered variable, under the Code, these will be set from year to year.

The aim of this paper is to propose values for these parameters that are to be used in the calculations of Required Credit Cover as defined in the Trading & Settlement Code when the market goes live.

Recommendations

The values listed in the table below are the values being proposed. These values are based on detailed analysis that has been done using data taken from Plexus market modelling, Participant demand data modelled on actual Participant demand in the current ROI wholesale electricity market, expected Capacity Demand prices (based on current Annual Load Forecast and the proposed Capacity Payment Sums).

Historical Assessment Period for Billing Period	45 days
Historical Assessment Period for Capacity Period	100 days
Analysis Percentile Parameter	1.96
Credit Cover Adjustment Trigger	15%
Maximum Level of the Warning Limit	75%
Fixed Credit Requirement for Supplier Units	€100,000
Fixed Credit Requirement for Generator Units	€10,000
Initial Credit Assessment Price	€102.816
Estimated Capacity Price	€10.18

Table 1 - Proposed Credit Risk Parameters

While recognising that this data is based on estimates and models, it is still useful in determining the parameters that will provide the best results to ensure appropriate levels of Credit Cover in SEM without placing too high a burden on Participants by over-stating requirements.

A key dependency on the duration of the Historical Assessment Period for Billing Period and Historical Assessment Period for Capacity Period is the Supplier Suspension Delay Period. This is not yet known and will not be published until August 31st 2007. The proposals listed above are based on a key assumption that the Supplier Suspension Delay Period will be 20 working days. Allowing for the inclusion of non-working days (as well as the current and previous Trading Day which will not have been settled by the time the Credit Assessment is carried out), the analysis used an Undefined Exposure Period of 28 days. This means that with a Historical Assessment Period for Billing Period of 45 days, it is possible to extract 18 sets of sample values from which to determine a value of Undefined Exposure. It is highly recommended that on publication of the Supplier Suspension Delay Period a review of these parameters is completed. If the Supplier Suspension Delay Period is set at 30 working days for example, the Undefined Exposure Period could end up being over 50 calendar days. It would not be possible to derive any workable sample values from a 45 day Historical Assessment Period in this case.

Credit Risk Parameters

The following sections provide an overview of the detailed analysis that has led to the above proposals.

Historical Assessment Period for Billing Period

The Trading & Settlement Code sets out two methods of calculation of the Undefined Exposure for Participants. One method, for the standard Participant, uses a statistical analysis of Settlement values for Trading Payments and Charges, and Variable Market Operator Charges. The other method, for the New or Adjusted Participant, uses a statistical analysis of historical System Marginal Prices in SEM.

In both of these methods, the analysis is conducted over a period of time known as the Historical Assessment Period for Billing Period. This is a period of recent history in SEM.

The duration of the Historical Assessment Period for Billing Period will have a direct impact on the appropriateness of the levels of Required Credit Cover that will be calculated. As noted above, the duration of the Supplier Suspension Delay Period has a direct impact on the length of the Historical Assessment Period for Billing Period and Capacity Period. In these models, the Supplier Suspension Delay Period is assumed to be 20 working days.

In the graphs shown below and the spreadsheets that accompany this document, comparisons were made between calculated Undefined Exposures and Realised Exposures. This was done by modelling settlement for a Participant for a number of months (from January through to September). Against these values, the calculation for the Undefined Exposure for Standard Participants was applied to determine the value on each day in the study period. The Realised Exposure was then calculated by summing the actual settlement values that occurred in the Undefined Exposure Period.

(Note that while the graphs above all use the same settlement values to produce the calculations of Realised and Undefined Exposure, the appearance of the trend is different. This is because of the different time periods used in each example. That is, the end of March peak is visible in the first three examples but not in the last two as when assessing over 90 and 120 days, the months of January through to March cannot be measured in this study as the settlement was from January forwards.)

The statistical analysis methods will always be inaccurate when dealing with the step changes that occur with seasonal changes. As a result all methods will show the Realised Exposure as greater than the Undefined Exposure at the end of August.

30 Days

Using a Historical Assessment Period of 30 days with an Undefined Exposure Period of 28 days results in very few samples that can be considered in the statistical analysis. This in turn leads to a very erratic and changeable Undefined Exposure that reacts to very short term events.

As can be seen in the graph below, the fluctuations in the actual exposure (represented by the Realised Exposure line) lead to corresponding fluctuations in the Undefined Exposure calculation. This will lead to frequent revisions of the Required Credit Cover for Participants.

Also, as can be noted, the calculation fails to provide cover in all cases, such as the spike event that appears at the end of March. This represents a larger settlement value in the Undefined Exposure Period. The calculation using 30 days responds with a corresponding spike in Credit Cover requirement toward the end of April, when the actual settlement values fall within its Historical Assessment Period.

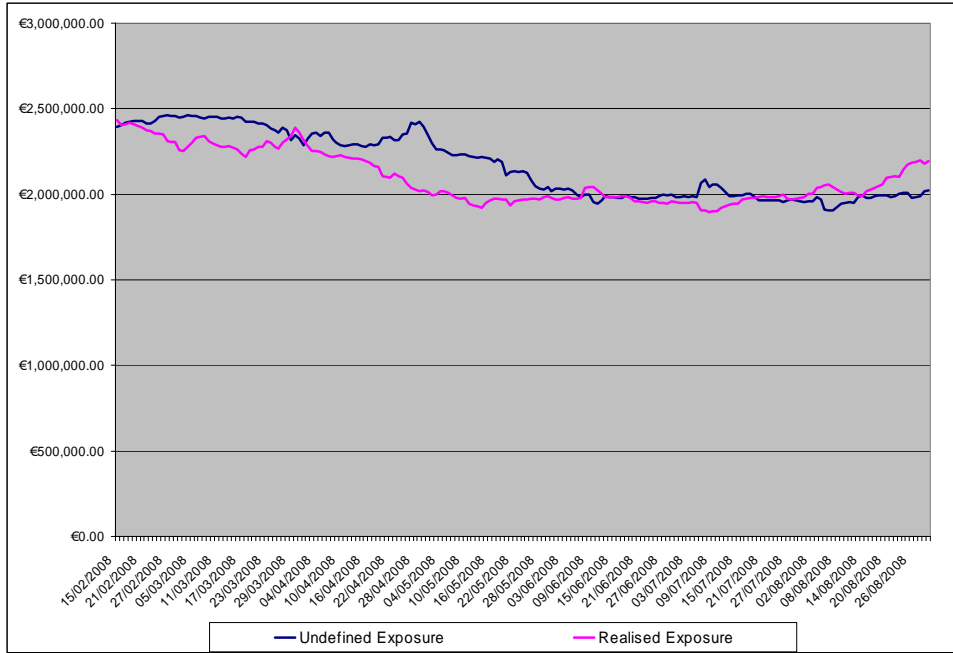


Figure 1 - 30 days HAP for Billing Period

45 Days

The 45 day Historical Assessment Period has the benefit of being able to respond to short term changes but also provide less erratic results. As can be seen below, measured against the same Realised Exposure, the 45 day HAP is not as susceptible to sudden changes in the actual exposures and produces a result that in most cases provides adequate cover in the market, while responding to changes in the Participant's volumes in a reasonable timely manner.

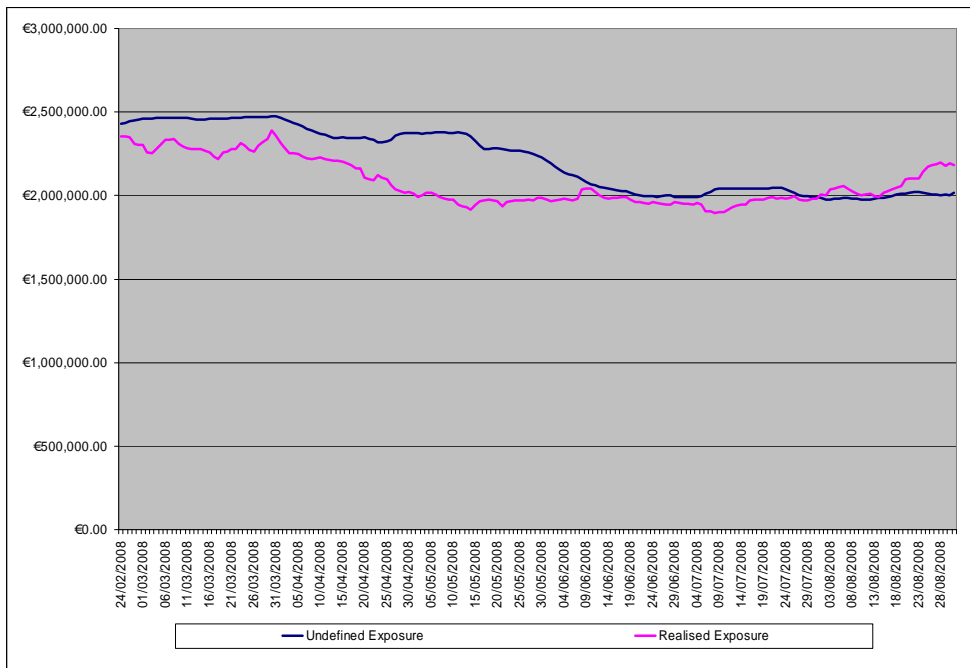


Figure 2 - 45 days HAP for Billing Period

60 Days

The 60 day Historical Assessment Period equally provides adequate cover in the market while responding to changes in the Participant's volumes. However, the responses are slower. Although the graph below appears to show a greater level of credit cover, the 60 day Historical Assessment Period will take a longer period of time to respond to the seasonal change that begins at the end of August in this study with the result that the Undefined Exposure will not take account of the changes meaning a large portion of the seasonal change will have to be managed through the Fixed Credit Requirement.

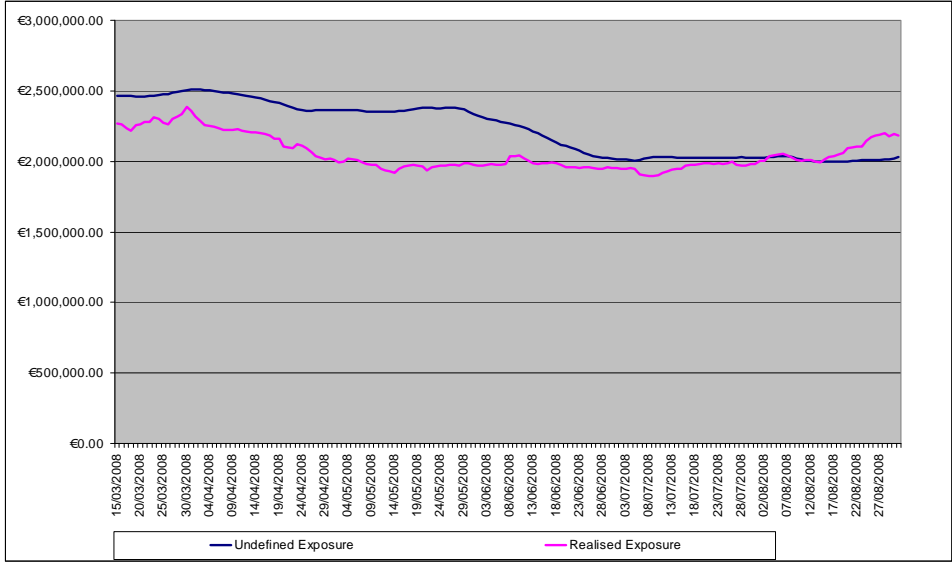


Figure 3 - 60 days HAP for Billing Period

90 Days

The 90 day Historical Assessment Period provides substantial cover in the market but does not provide adequate responses to changes in the Participant's volumes. In the graph below, the Undefined Exposure is considerably higher than the Realised Exposure while the calculation effectively assesses the Participant's credit requirements for the summer months against volumes from January and February. This will result in Participant's being asked to present high levels of Credit Cover when it is in fact not needed. Equally, the winter months will be assessed against the summer volumes and the resulting calculation of Undefined Exposure will be short of the Realised Exposures.

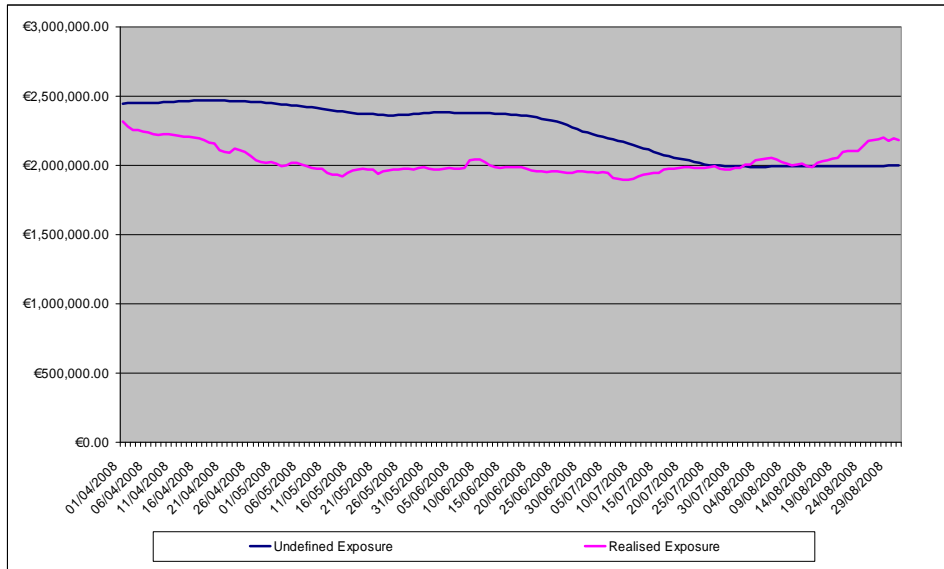


Figure 4 - 90 days HAP for Billing Period

120 Days

The 120 day Historical Assessment Period significantly overstates the amount of the Undefined Exposure and will result in Participants being asked to provide much higher levels of Credit Cover than is actually required during the summer months while failing to produce adequate results in the winter months. The slow level of change response found in using the 120 day Historical Assessment Period is such that it makes the statistical calculation ineffective.

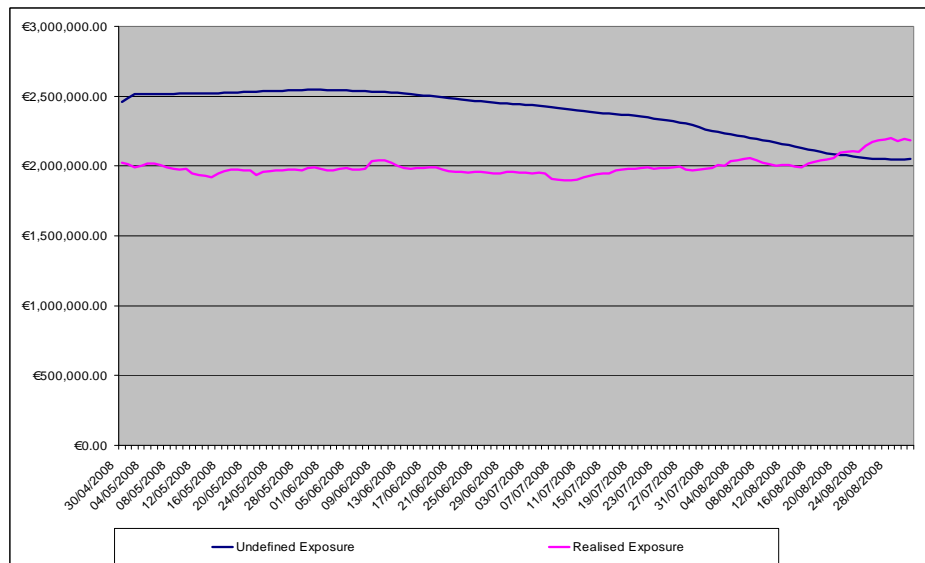


Figure 5 - 120 days HAP for Billing Period

Conclusion

The 45 day Historical Assessment Period for Billing Period has the benefit of providing cover to the market without over-burdening the Participant by requiring more Credit Cover than is necessary and also provides a short term response to seasonal changes. This would mean there would be less necessity to set the Fixed Credit Requirement to a level that would cover this.

For comparison purposes, the 45 day Historical Assessment Period is displayed below limited to the same time-frame used in the graph for the 120 day Historical Assessment Period above.

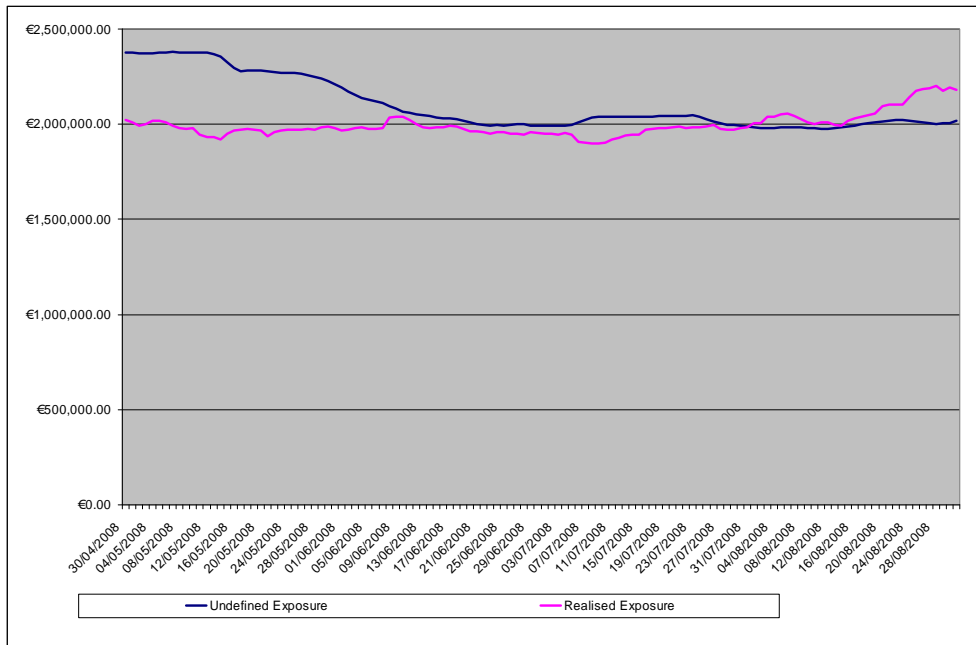


Figure 6 - 45 days HAP for Billing Period

Historical Assessment Period for Capacity Period

The Trading & Settlement Code sets out two methods of calculation of the Capacity Payment and Charges Undefined Exposure for Participants. One method, for the standard Participant, uses a statistical analysis of Capacity Payments and Charges. The other method, for the New or Adjusted Participant, uses a statistical analysis of historical Capacity Prices in SEM.

In both of these methods, the analysis is conducted over a period of time known as the Historical Assessment Period for Billing Period. This is a period of recent history in SEM.

The duration of the Historical Assessment Period for Capacity Period will have a direct impact on the appropriateness of the levels of Required Credit Cover that will be calculated. As noted above, the duration of the Supplier Suspension Delay Period has a direct impact on the length of the Historical Assessment Period for Billing Period and Capacity Period. In these models, the Supplier Suspension Delay Period is assumed to be 20 working days.

Typical Capacity Undefined Exposure Profile

Due to the monthly cycles of capacity settlement and invoicing the levels of Undefined Exposure Cover required will build up over a month period and then reduce significantly once the monthly capacity settlement is completed. This settlement is defined in the code as needing to occur within 5 working days of the end of a given calendar month.

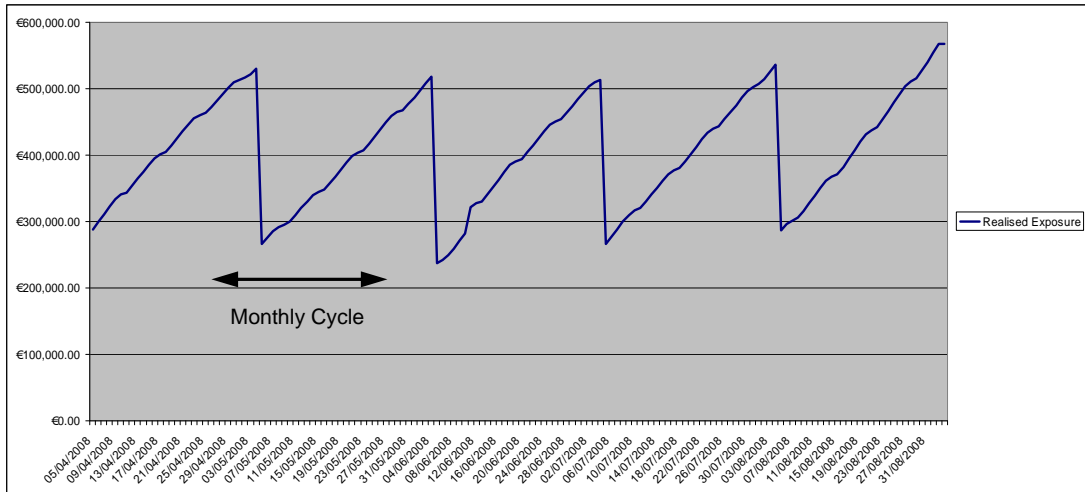


Figure 7 - Cyclical Nature of Capacity Undefined Exposure

From a statistical analysis point of view, to provide a representative sample for calculation of the Capacity Undefined Exposure, a minimum of 30 samples (equivalent to one month) should be taken to ensure that the mean Capacity Undefined Exposure and the standard deviation used in the Capacity Undefined Exposure is representative.

As for the Billing Period the Supplier Suspension Delay Period is assumed to be 20 working days. This equates to approximately 28 days from issuance of a suspension notice when non-working days are taken into account.

The Undefined Exposure Period for Capacity is evaluated as the period from the last settled Capacity Period to the present date. This means the Undefined Exposure Period can range in duration from:

- a) 33 days, if the present date is equal to the day the capacity invoice is calculated. i.e. 28 days for the Supplier Suspension Delay and 5 working days between the end of the capacity period and the date of capacity invoicing.
- b) 70 days, if the present date is equal to the day before the capacity invoice is calculated i.e 28 days for the Supplier Suspension Delay, 4 days between the latest capacity period and the present date, and 31 days for the latest capacity period that has not yet been calculated. This equates to 63 days. To allow for the occurrence of non-working days during the first 5 days of a given month the duration has been rounded to 70 days.

As mentioned previously, a minimum of 30 days of samples (equivalent to one month) should be taken to allow for the cyclical nature of the Undefined Exposure. Therefore, the minimum Historical Assessment Period for Capacity should be 100 days i.e. Maximum Undefined Exposure Period 70 days plus 30 days of samples.

Conclusion

The 100 day Historical Assessment Period for Capacity Period will ensure an adequate sample size is available for calculation of Capacity Undefined Exposure Credit Cover, while minimising the amount of historical data required for calculation and allow a rapid response to seasonal changes.

Analysis Percentile Parameter

The statistical calculation of Undefined Exposure for Standard Participants is based on the calculation of a Percentile value. As part of this type of calculation, the standard deviation of the samples is multiplied by the Z score on the Bell Curve. Depending on the Z score value used, the resulting value can be said to the 95th percentile or the 99th percentile. The Z score value is known as the Analysis Percentile Parameter in the Trading & Settlement Code.

In the Rules of Credit Risk document produced by the SEM IT in November 2006, the following table was used.

Analysis Percentile	Analysis Percentile Parameter
80	1.28
90	1.645
95	1.96
98	2.33

It was published to Participants that the Analysis Percentile Parameter used within the Credit Risk calculations in the market would be based on this table. Recognising that the values included within this table do not correspond with Tables of Normal Distribution that are available on the web (for example, <http://www.math.unb.ca/~knight/utility/NormTble.htm>, where the value of 0.9505 has a Z score of 1.65 as opposed to the value of 1.96 listed above), when compiling analysis for this report, the above published values were used.

As the Analysis Percentile has not become a code term and is no longer used in market documentation, the issue does not arise as it is the intention to select a value of Analysis Percentile Parameter. Whether this is called the 95th or 97th percentile is irrelevant as it will not be identified as such in any market documentation.

The study took account of three Participants with different Settlement amounts. These were assessed over a period of two months where there was minimal impact of seasonal change on the calculations. Calculations were done using the 45 day Historical Assessment for Billing Period

The same Participant data as used in other models in this report was used to as one of the Participants in this model. The effectiveness of each of the values of the Analysis Percentile Parameter was measured as the calculated Undefined Exposure expressed as a percentage of the Realised Exposure.

This was only modelled against the Trading Payments and Charges as it is believed that the step change will affect the Capacity Payments and Charges in the same manner.

The graph below demonstrates the demand values of the three Participants used in the model. Note that Participant B has a standard repeating trend with no fluctuations from week to week. This means that the Credit Cover calculation has a more reliable set of volumes on which to base its analysis and, barring major movement in the prices, the statistical analysis should be able to produce reasonably accurate values.

Participant A has an increase in demand values for the four weeks from the last week in June to the third week in July (in the graph below, note the higher weekly values on the right side of the graph). This means that the Realised Exposure will be greater than the Undefined Exposure for these periods as the Undefined Exposure is based on the lower demand values earlier in the model. As a result, we should expect to see the calculations not being as efficient with Participant A as they should be with Participant B.

Similarly, Participant C has some volume peaks occurring in the middle weeks of June and the second week of July that should affect the efficiency of the Credit Cover statistical calculation.

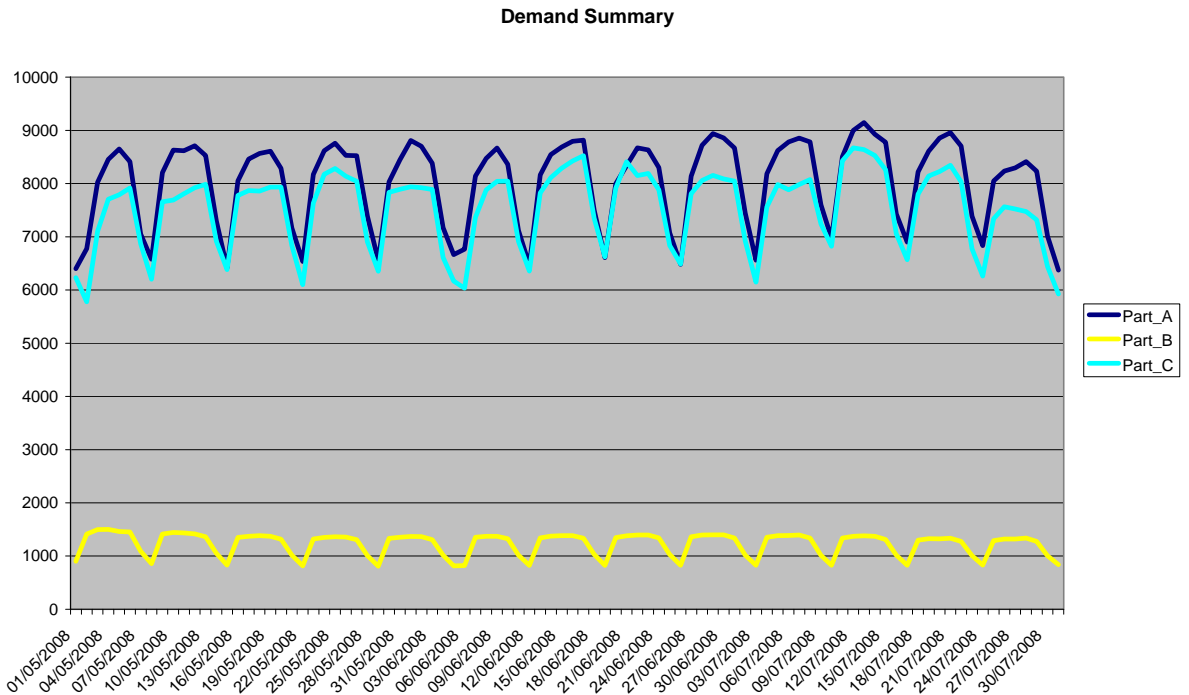


Figure 8 - Demand Values for Participants in model

For the first Participant in the model, the least efficient value was 1.28 which failed to provide 100% efficiency on 41 of the test dates. However, as can be seen from the volumes above, they include demand increases to test the success of the different values. While 1.28 proved to be most inefficient, even the maximum value considered, 2.33, was unable to provide 100% efficiency on 19 days of the test period.

It should also be considered that while not providing 100% accuracy, the calculation at 1.28 was still within 1% on all but 9 occasions.

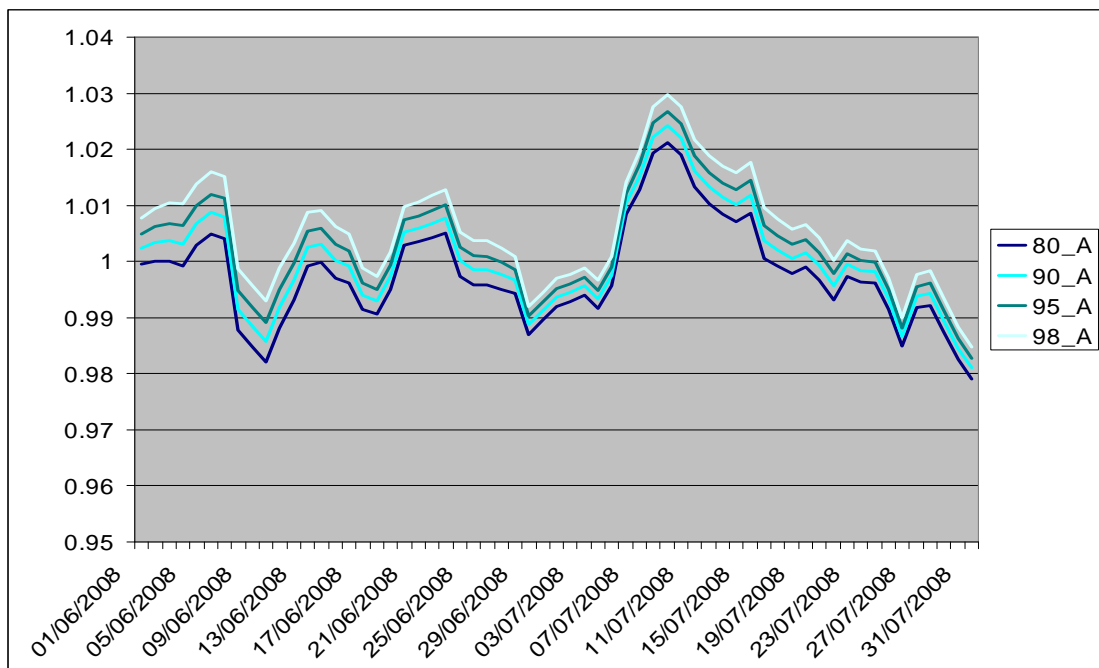


Figure 9 - Efficiency against Participant A

The second Participant in the model, also the same Participant volumes used in the HAP for Billing Period and Credit Cover Adjustment Trigger assessments, showed much greater efficiency during the same time frame with all values of the Analysis Percentile Parameter providing 100% efficiency with the exception of one day for the value of 1.28.

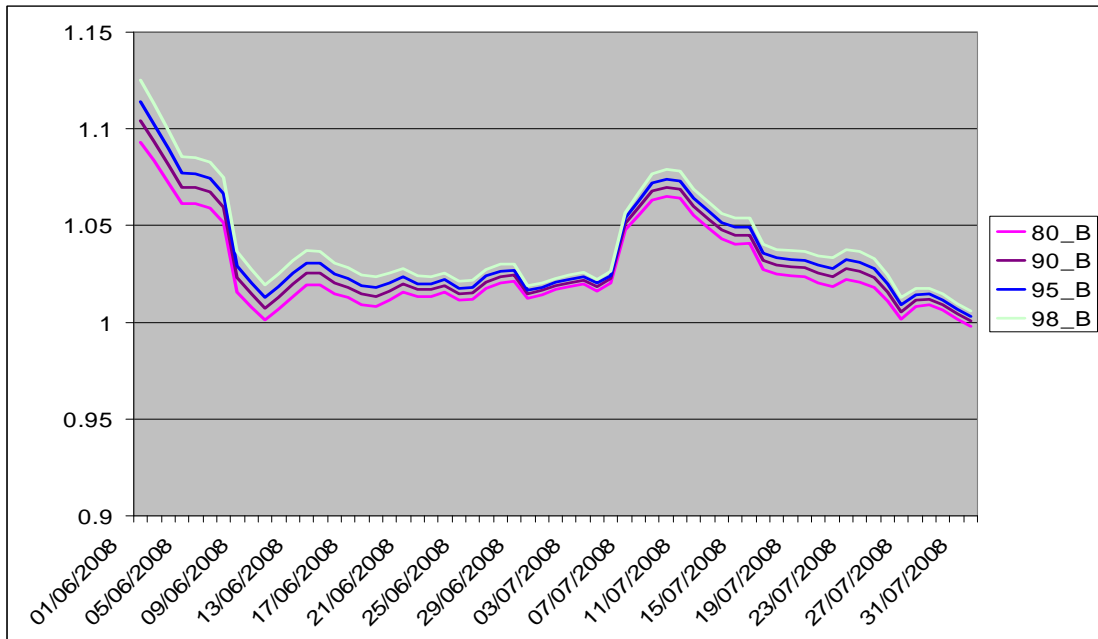


Figure 10 - Efficiency against Participant B

The third Participant in the model showed similar results to the first Participant, where all values of the Analysis Percentile Parameter did not enable the calculation to meet the Realised Exposures that were calculated. Again, this is a direct result of the input data used but this also reflects what can be expected in the actually running of the market where Credit Cover calculations for the Undefined Exposure will calculate a value that in probability terms should meet the realised values.

Again, similar to the first Participant, the level of efficiency, even when less than 100% was still within 1% on most occasions.

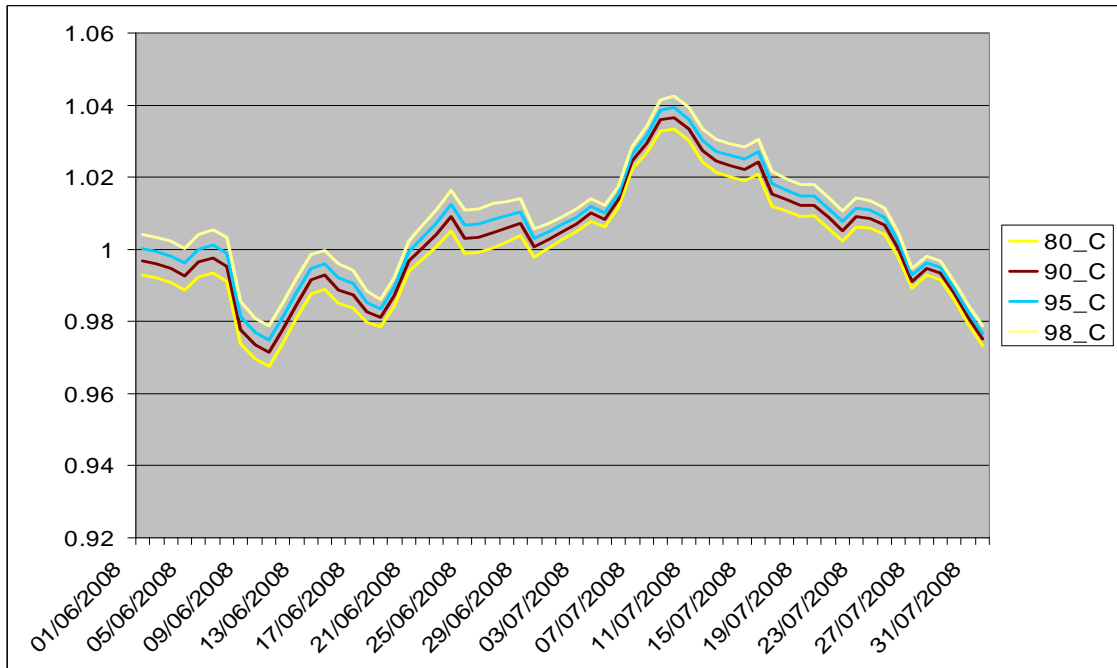


Figure 11 - Efficiency against Participant C

Conclusion

Clearly the highest value, 2.33, provides the best options while the lower values tend to be less successful.

As the bulk of the statistical calculation relies on the calculation of the mean Settlement value, the value of (Analysis Percentile Parameter * Standard Deviation) is a relatively minor part of the calculation. The graph below represents the differences in the amount that were calculated using the different values of Analysis Percentile Parameter against Participant C. Where the calculation normally yielded an Undefined Exposure of around €11 million, the Analysis Percentile Parameter by Standard Deviation portion of this calculation ranges from €150,000 to €300,000.

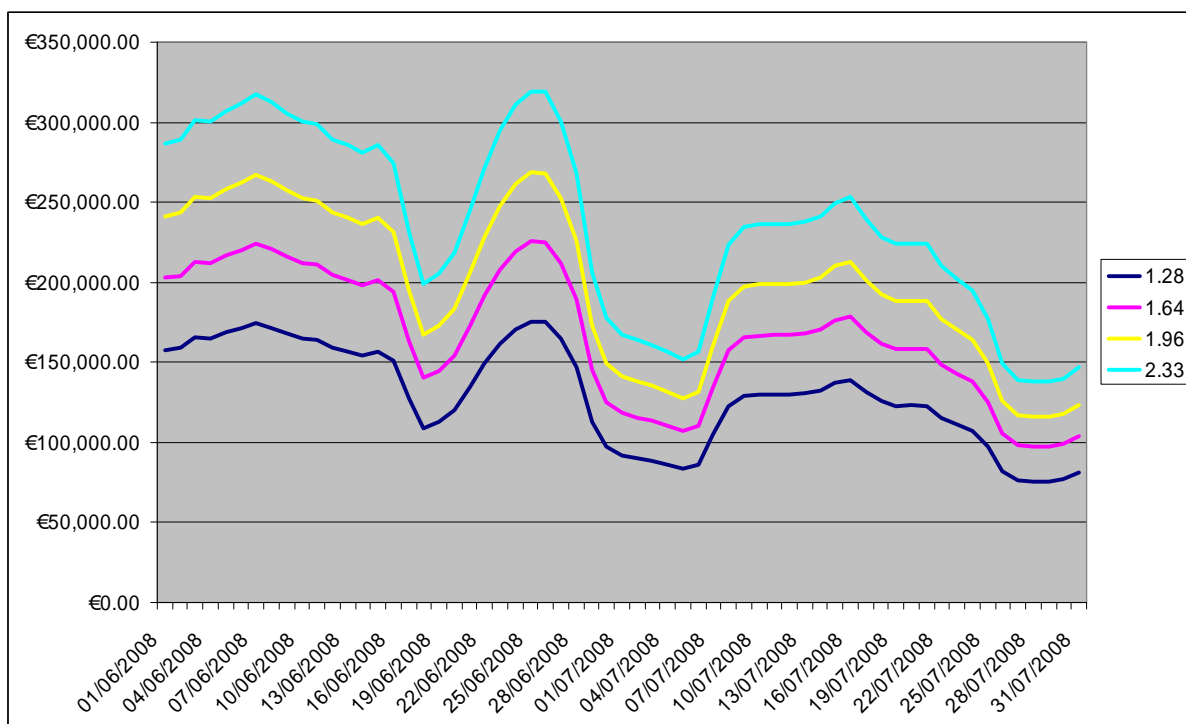


Figure 12 - AnPP*St Dev, values

As a percentage of the total Undefined Exposure calculated in this example, the differences between the different Analysis Percentile Parameters are of an order of ½ %. Bearing in mind that the results generally yielded little difference between the use of the higher range values, it may be considered that use of 2.33 has a value in this calculation is too high.

It is therefore proposed that the Analysis Percentile Parameter is set at 1.96.

Credit Cover Adjustment Trigger

The statistical calculations for Standard Participants as set out in the Code, assume a normal distribution and, as such, work to a reasonable effectiveness when a Participant's volume of trade is not subject to major fluctuations. However, this assumption is not in keeping with standard market practice. It must be assumed that each Participant entering the market intends to augment its customer base, thereby increasing its trade volumes.

The statistical calculations should manage small changes to a Supplier Units retail customer profile. However, it is believed that if a Supplier Unit were to enter into retail agreements with such a number of demand sites that its trade volumes increased by a step percentage there is a point at which the Participant must notify the Market Operator because the statistical calculations for a Standard Participant will no longer prove effective. This step percentage is known as the Credit Cover Adjustment Trigger.

When a Participant is aware that their Supplier volumes will increase by a value greater than the Credit Cover Adjustment Trigger, there is an obligation on the Participant to declare this to the Market Operator and the Participant will be classified an Adjusted Participant until such time as there is sufficient historical data of their new level of trade.

When there is a step change in volumes, the statistical calculations will always underestimate the exposure until the adjusted volumes become part of the historical assessment. Using the 45 day Historical Assessment Period for Billing Periods, the calculations for Trading Payments and Charges adjusted generally within 30 days of the step change.

Even a change of only 1% will result in the calculations not delivering an accurate estimate. The question to be resolved by the Credit Cover Adjustment Trigger is what is an acceptable level for the standard calculations to be out by.

The same Participant data as used in other models in this report was used to model percentage step changes to determine the effect that this would have on the Realised and Undefined Exposure. This was only modelled against the Trading Payments and Charges as it is believed that the step change will affect the Capacity Payments and Charges in the same manner.

The Historical Assessment for Billing Period used was the 45 day period.

The Analysis Percentile Parameter used was 1.96.

The study was done over the values for the months of June and July to avoid the seasonal impacts that are included in the Realised Exposure Values in August. In each case, the amounts from July 1st were increased by the discussed percentage value.

25%

In the following example, the Participant's Settlement amounts were increased by 25% to measure the impact during the assessment (as this sample is based on a Supplier Unit, a 25% increase in trade volumes will result in a 25% increase in Settlement amounts as all calculations for Supplier Unit are at base Aggregated Metered Demand * Price).

As is clear from the graph below, the change of 25% resulted in considerable difference between the Realised Exposure and the calculated Undefined Exposure for a significant duration. Although the calculation begins adjusting upwards almost immediately (the graph shows the Undefined Exposure increasing from July 6th), it is another month before the calculation has taken full consideration of the change. As a result, this Participant's calculated Required Credit Cover would be insufficient to cover the Realised Exposures in the event of a default occurring during this timescale.

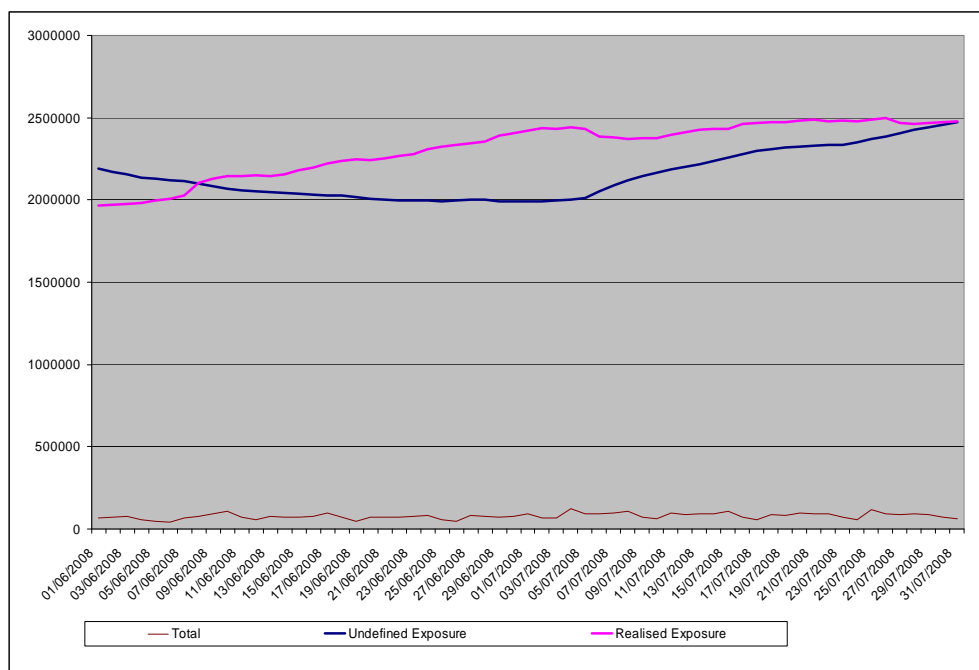


Figure 13 - 25% step change in volumes

The difference between the Undefined Exposure calculation and the actual Realised Exposures peaks at a difference of over €400,000 when the step change occurs (where the Participant's Undefined Exposure is calculated at just under €2m and the Realised Exposure is closer to €2.5m on July 2nd).

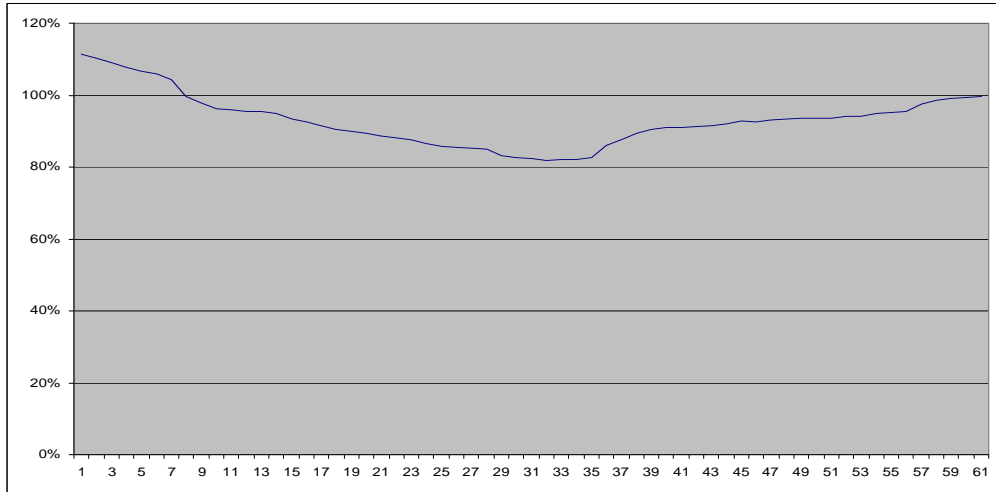


Figure 14 - Ratio of Undefined to Realised Exposure (25%)

This graph represents the ratio of Undefined Exposure to Realised Exposure. This falls to 82% for the date mentioned above where the gap between the Undefined Exposure and the Realised Exposure is at its greatest.

This would mean that at this point in time, the Required Credit Cover would be considerably short when considering the Undefined Exposure.

15%

In the following example, a change of 15% has been introduced in the same manner. As before this has resulted in a sudden imbalance between the Realised Exposure and the calculated Undefined Exposure. With this circumstance, the monetary differences are not as substantial and the calculation appears to adjust to the new volumes faster (although it equally takes around 30 days to fully take account of the new Settlement amounts).

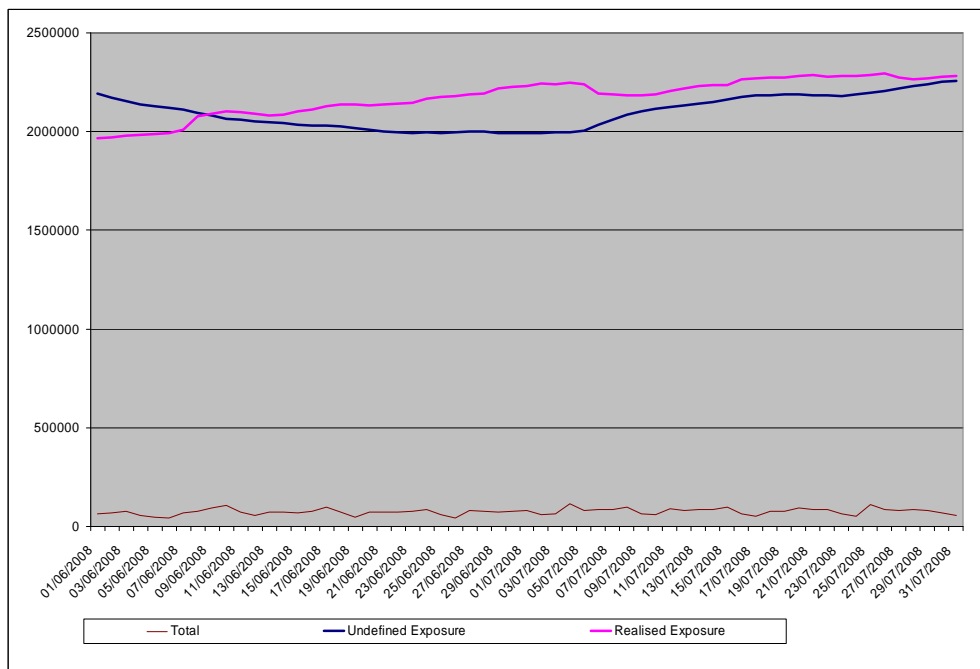


Figure 15 - 15% step change in volumes

Financially the largest shortfall between the exposures is around €250,000.

Represented as a percentage below, the largest difference between the Realised and Undefined Exposures coincides with the actual step change event at the beginning of July but the gap at this point is 89% (meaning the Undefined Exposure is only representing 89% of the Realised Exposure).

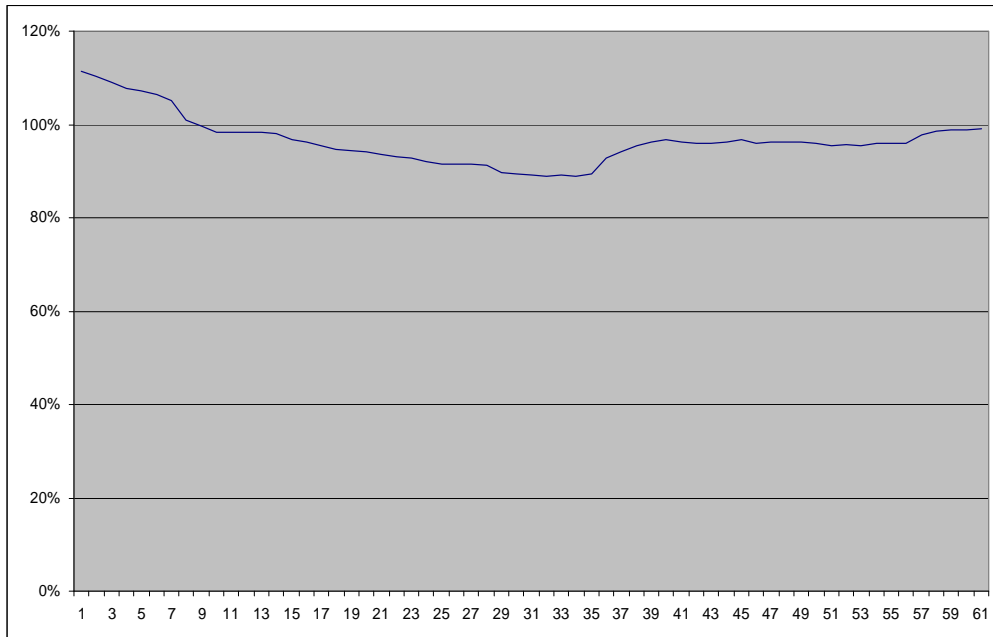


Figure 16 - Ratio of Undefined to Realised Exposure (15%)

10%

The example below shows the impact of a 10% increase in trade. The event shares the same characteristics as previous ones - sudden step increase that takes up to 30 days to adjust for, maximum imbalance between the exposures at the beginning of July, to coincide with the change.

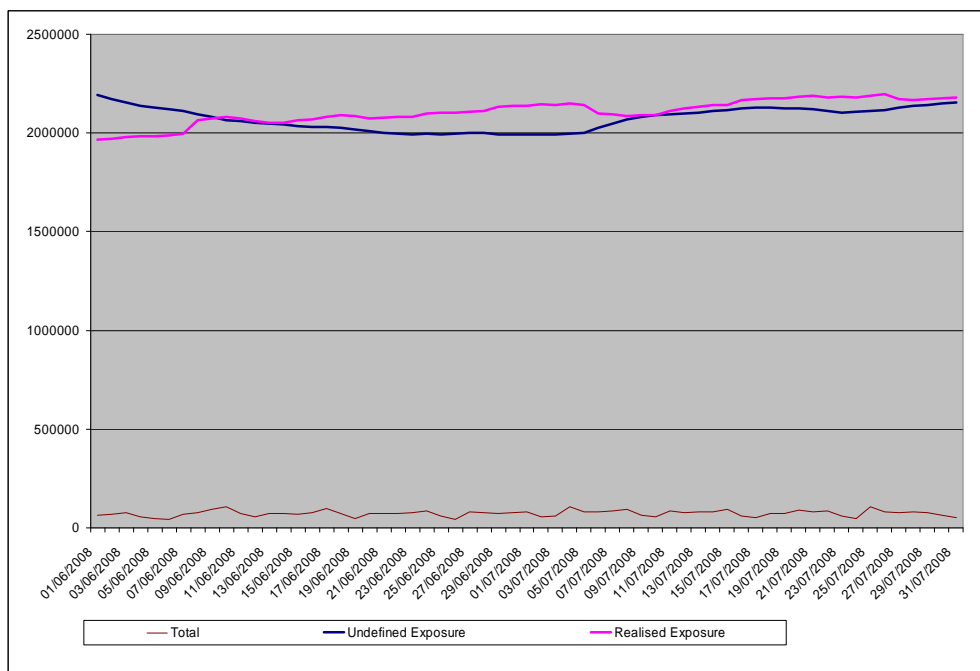


Figure 17 - 10% step change in volumes

As expected, the percentage difference at this point is smaller, with the Undefined Exposure representing 93% of the Realised Exposure as shown below. Financially with this Participant, this represents an imbalance of €200,000.

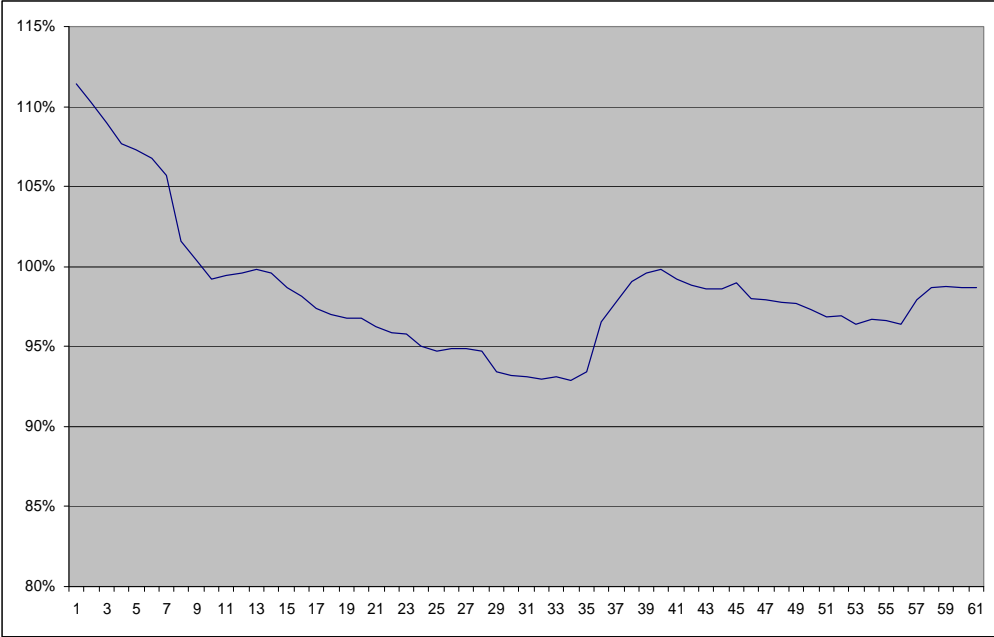


Figure 18 - Ratio of Undefined to Realised Exposure (10%)

7.5%

The example below shows the impact of a 7.5% increase in trade. The event shares the same characteristics as previous ones. There is a sudden step increase that takes up to 30 days to fully adjust for. However with the smaller step change, it can be seen that the Undefined Exposure still calculates in excess of the Realised Exposure for some dates showing that the 7.5% change in Settlement amounts does not have a huge impact on the statistical calculation. Again, a maximum imbalance between the exposures occurs at the beginning of July, to coincide with the change.

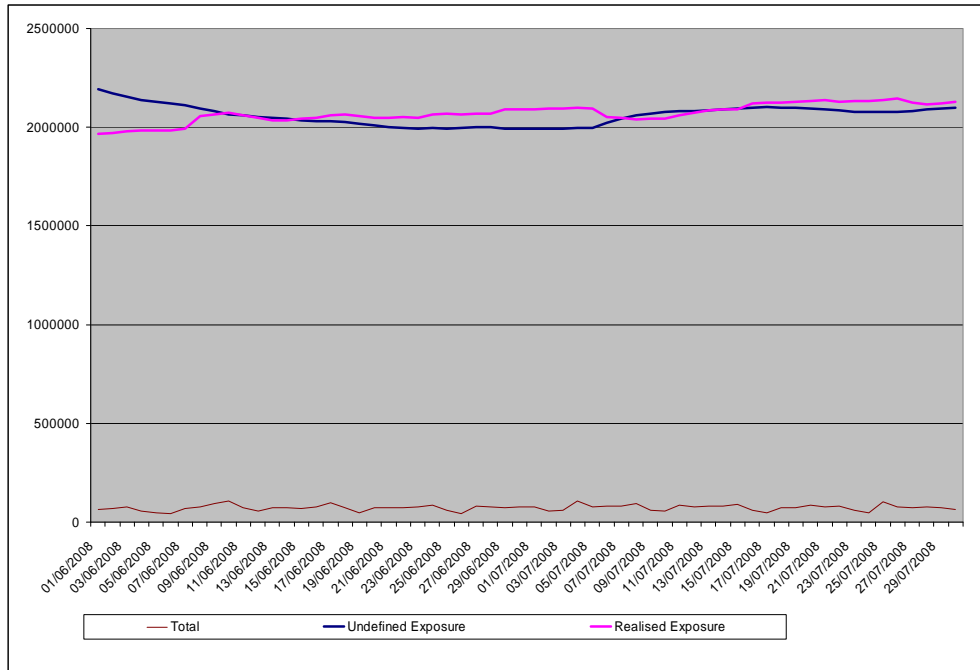


Figure 19 - 7.5% step change in volumes

Financially, the largest gap is €100,000, when the Undefined Exposure calculation is yielding results that are 95% of the Realised Exposure as demonstrated in the graph below.

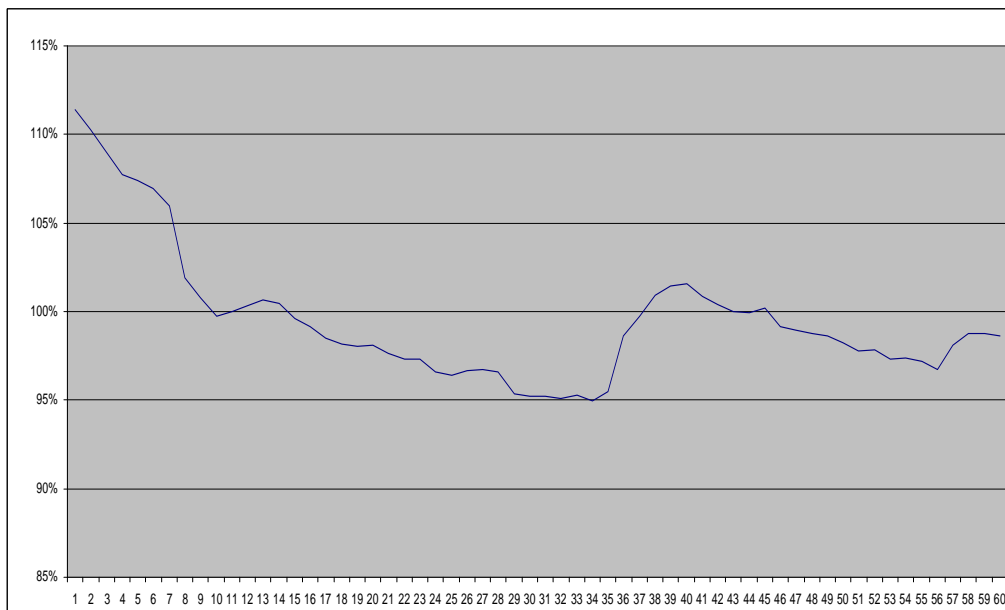


Figure 20 - Ratio of Undefined to Realised Exposure (7.5%)

5%

The example below shows the impact of a 5% increase in trade. The event shares the same characteristics as previous ones. However the impact of such a small change appears minimal. Again, a maximum imbalance between the exposures occurs at the beginning of July, to coincide with the change.

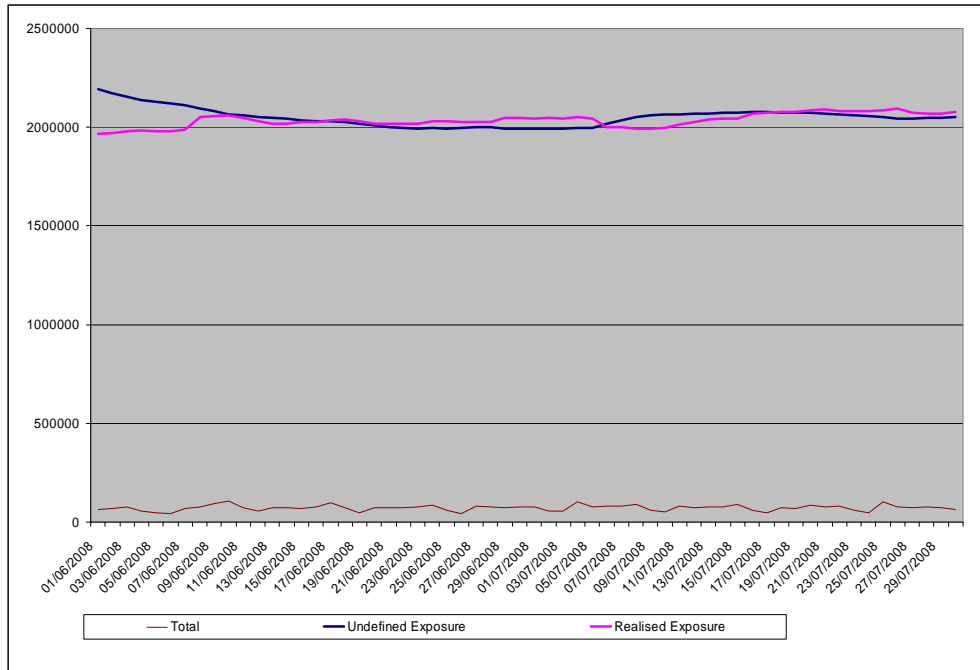


Figure 21 - 5% step change in volumes

The largest gap is when the Undefined Exposure calculates up to 97% of the Realised Exposure, leaving a value of just over €50,000 unsecured. Also the duration of the imbalance is much shorter with the statistical calculation very quickly adjusting for the step change with the calculated amounts being less than the realised values for only 18 days as compared with the 50 days that occurs with the 25% step change.

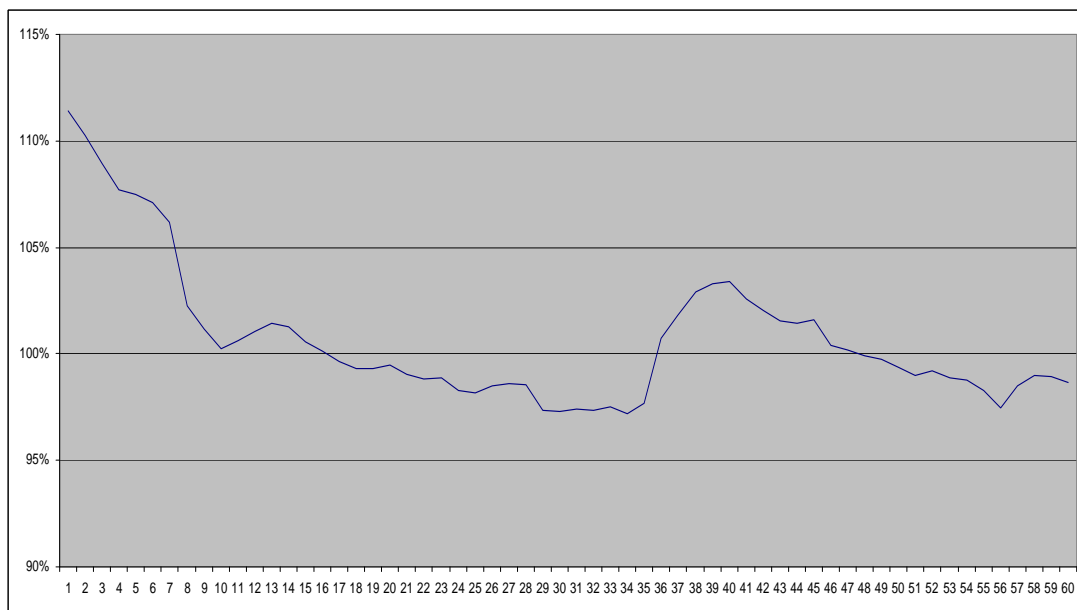


Figure 22 - Ratio of Undefined to Realised Exposure (5%)

Conclusion

The following graph summarises the percentage imbalance that occurs in the statistical calculation of Undefined Exposure with each of the step changes. In each case the calculation proved to be less than effective as expected.

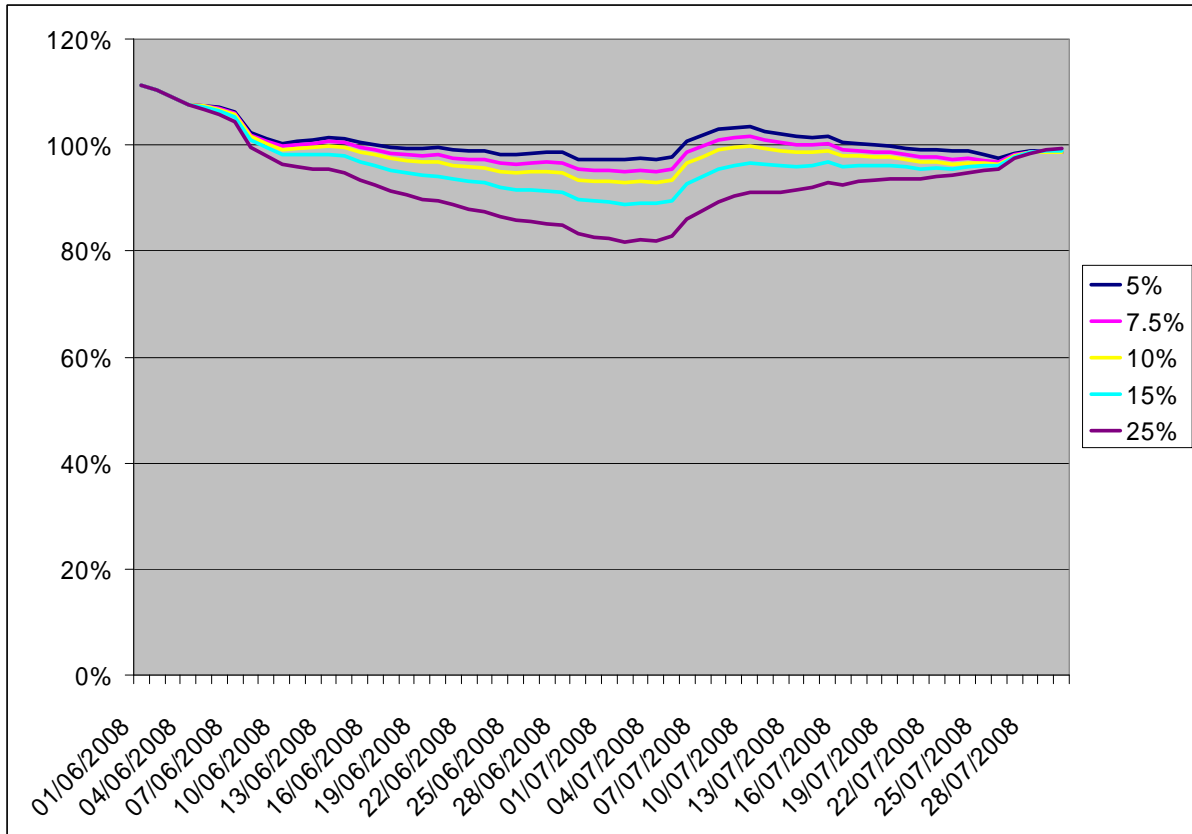


Figure 23 - Summary of Undefined to Realised Exposure ratios

The step change of 25% resulted in substantial market risk as the calculations only achieved 83% of the realised amounts, leaving the market unsecured for these monies.

The step change of 5%, while showing least impact, must be seen as an unacceptable figure as expecting Participants to resubmit forecast volumes for every 5% change in volumes could be very onerous, especially on Participants with smaller customer bases where a 5% change could be brought about by adding one new retail customer.

The same statements are true of the 7.5% change.

When comparing the impacts that occur when considering the step changes at 10% and 15%, there is no great benefit in using the lower 10% figure.

While setting the Credit Cover Adjustment Trigger at 10% could be considered to place similar restrictions on Participants as requiring the resubmission of forecast volumes that the 5% change would do, the changes in the efficiency of the statistical calculation – from 89% at 15%, to 93% at 10%, representing a change between €250,000 and €200,000 in our study, which is only a difference of €50,000 when considering Realised Exposures of over €2 million – are not so great that there is considerable benefit to setting the Credit Cover Adjustment Trigger at this level.

It is therefore proposed that the Credit Cover Adjustment Trigger is set at 15%.

Maximum level of the Warning Limit

The Warning Limit is a parameter used to assist Participants in setting their levels of Posted Credit Cover. Separate from the concept of a Credit Cover Increase Notice which will issue when a Participant's Required Credit Cover is greater than their Posted Credit Cover, a

Warning Notice will issue to a Participant when the ratio of Posted Credit Cover to Required Credit Cover exceeds the Warning Limit.

The Market Operator has proposed allowing Participant's to adjust the Warning Limit to suit their own individual needs so that a Participant can set their warning level lower than the market default if they wish to receive warnings at earlier stages.

The purpose of the Warning Limit is to allow Participants time to adjust their levels of Posted Credit Cover should they feel this is required before a Credit Cover Increase Notice is called for.

To assess the requirement, a review was conducted against the Participants used elsewhere in this paper. Two Participants were chosen and a value of Posted Credit Cover was assigned that would result in a Credit Cover Increase Notice being issued. The assessment was done against Trading Payments and Charges only and the calculated Required Credit Cover did not take account of any Capacity Payments and Charges.

The graph below represents the trends of one of the Participants. The weekly spike is caused by the amassing of Actual Exposures from week to week, which falls away with the payment of the Invoice each Wednesday. As a result, there is a marked difference between the margin between the Required Credit Cover and the Posted Credit Cover between the payment due date and the day after. In this example, where the Participant's Posted Credit Cover is set at €4.5 million, the change ranges by 14% from the date after the payment due date to the next payment due date.

In this example, the Participant's Posted Credit Cover falls below the Required Credit Cover at the payment due date around the 23 of August. As payment is made, the Required Credit Cover falls back down the following day.

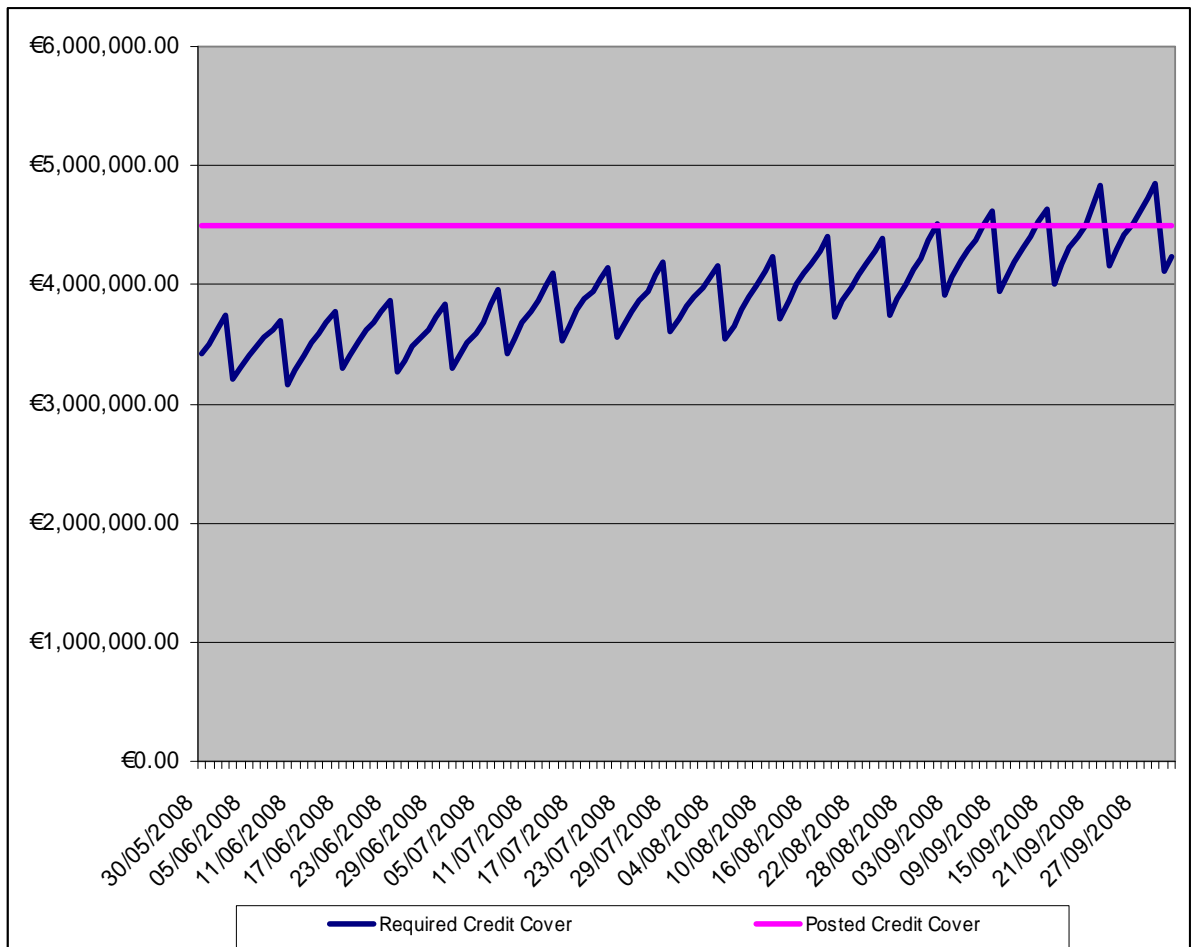


Figure 24 – Required Credit Cover to Posted Credit Cover

This means that any Credit Cover Increase Notice issued on 23rd August is considered responded to by the following day. However, it is clear that this Participant's position is not satisfactory as it will again be in breach of requirements a week later. At the low point, the Participant's margin of Required to Posted Credit Cover is at 87%. As we expect a change of up to 14% as the Actual Exposures amass, it is clear that this level is perilously high. Any warning issued to the Participant at this time must be acted on with urgency to avoid further default.

In this example, to provide ample time to the Participant to enable them avoid the defaults that begin at the end of August, a warning notice should ideally issue two weeks previously. At this point, the margin of Posted to Required Credit Cover is at 82% on the day after the payment date (which will raise to around 96% on the next payment due date).

In the second example, the Participant is constantly hovering around the Posted Credit Cover value. This behaviour is perfectly within the rules of the Code but is posing considerable risk to the market as is demonstrated when the Participant falls into default in the middle of August.

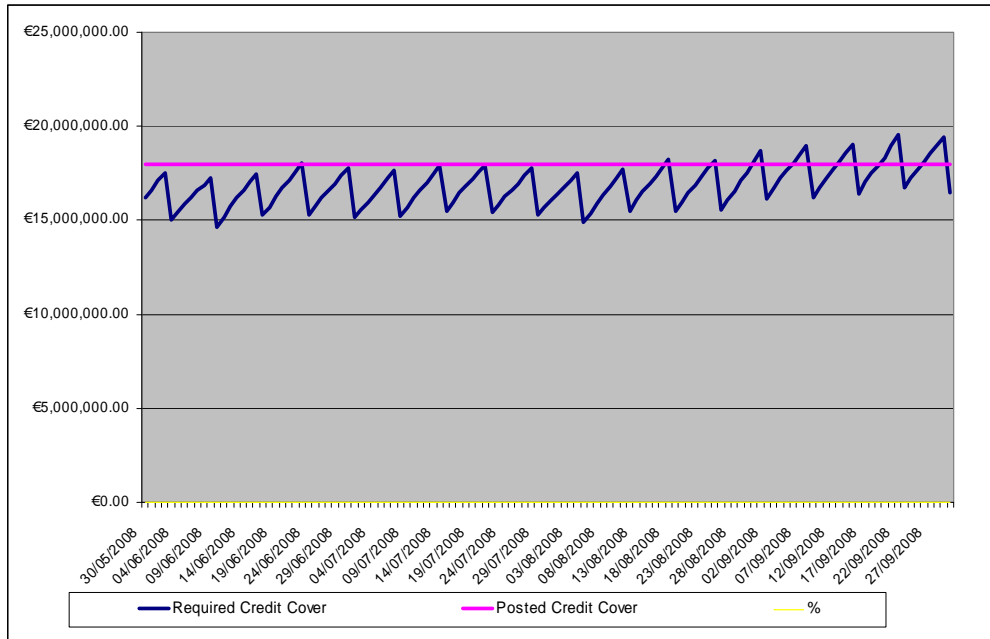


Figure 25 - Required Credit Cover to Posted Credit Cover

As demonstrated in the graph below, the Participant margin of Posted to Required Credit cover ranges between 81% and 100% before falling into default.

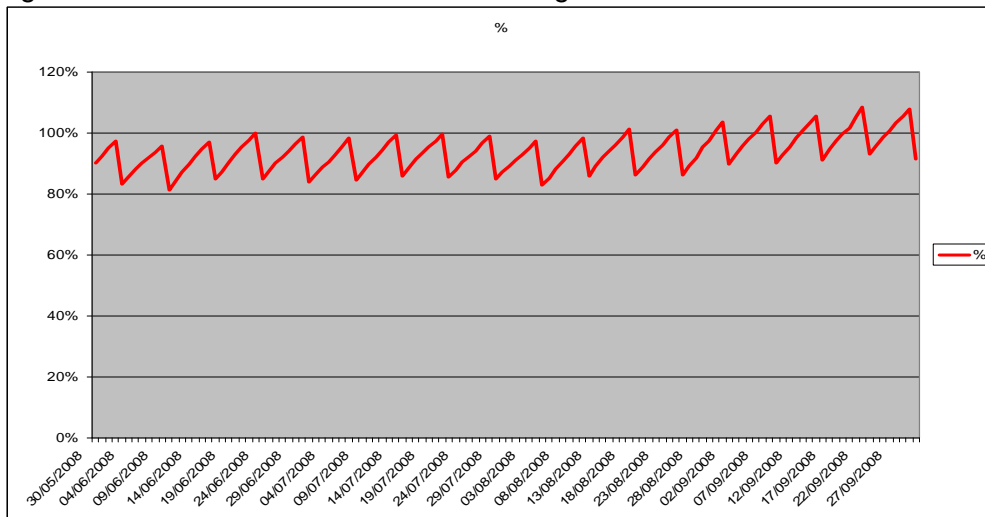


Figure 26 - Margin of Required to Posted Credit Cover

Conclusion

It would be apparent that a margin of Posted to Required Credit Cover of 80% can still pose considerable risk as the amassing of Actual Exposures can push this margin to extremes in the space of a single Billing Period. Any Warning Notice issued to a Participant when the margin exceeds 80% may prove ineffectual as there will be very limited response time. Taking account of the possible change to the Posted to Required Credit Cover margin of up to 14% across a single week would mean that the Warning Limit default value must be lower than this to provide the Participant with a practical amount of time in which to respond.

It is therefore proposed that the Maximum Level of the Warning Limit is set at 75%.

Fixed Credit Requirements

The Trading & Settlement Code provides for a Fixed Credit Requirement. This is an amount set separately for Generator Units and Supplier Units.

The intent of the Fixed Credit Requirement is provide a base level of Credit Cover that would be provide a further guarantee of cover during exceptional circumstances such as unforecasted priced spikes, unforecasted changes in demand consumption brought about by sudden changes in weather conditions.

There are two other elements of risk in the market that can be addressed through the Fixed Credit Requirement. These are the Settlement Reruns and the winter adjustment of the Capacity Payment Sums.

Settlement Reruns are done on a timetabled schedule with the first occurring in the fourth month and the second occurring in the thirteenth month after Initial Settlement. These timetabled reruns are based on re-aggregations of metered demand that will be carried out by the Meter Data Providers responsible for Supplier Unit volumes. At present it is believed that Meter Data Providers are able to provide aggregated metered demand values that are 99% accurate by D+4 leaving only 1% based on estimate. Considering current metering practices are for the delivery of aggregated metered demand by D+10 and the re-aggregation values currently being provided show adjustments of less than ½ %, it would seem that this estimated is reasonable. This would mean that the Settlement Reruns, currently not accounted for in the statistical calculations, need to be augmented by a sum to manage this.

The Capacity Period Payment sums have been proposed to recognise when Capacity is most required and naturally has allotted a large portion of its payments into the winter months with some substantial step increases over the last four months where the payment sum increases by 20% from September to October and again from October to November.

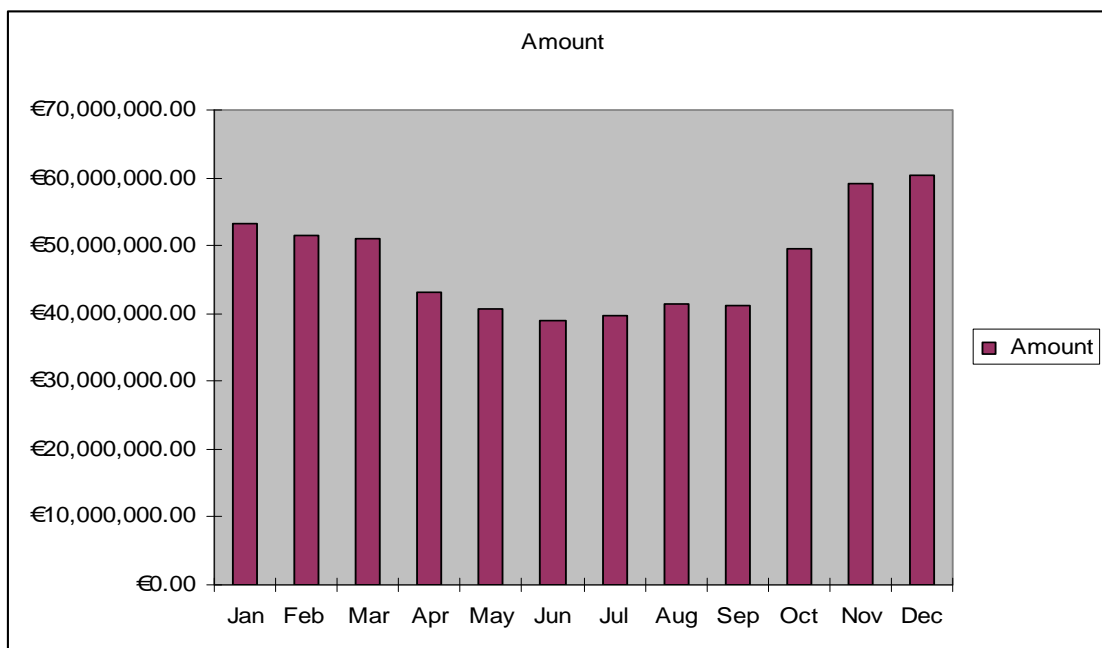


Figure 27 - Capacity Period Payment Sums for 2008

The statistical method of analysis set out in the Code will not capture this step change and will result in the values of Required Credit Cover being lower than the realised exposures in most cases.

Although it is recognised that each Participant will be affected by this step increase in proportion to their own demand, it is proposed that the Fixed Credit Requirement take consideration of this.

Taking a conservative average supplier volume of 1200MWh, this has been multiplied by the proposed Initial Credit Assessment Price for Billing Periods (as set out below as the Estimated Energy Price plus the Variable Market Operator Price plus the Imperfections Price) of €92.636. This is then factored by the duration of the Undefined Exposure Period (28 days assuming a

Supplier Suspension Delay Period of 20 working days). Assuming the metered demand may change by 1%, this would give a value of €31,125.696.

Taking the same average supplier volume, considering a step increase of 20%, using the Estimated Capacity Price of €10.18 taking account of the same duration of Undefined Exposure Period, this would provide a value of €68,409.60.

Taking consideration of these values, it is therefore proposed that the Fixed Credit Requirement for Supplier Units is set at €100,000.

Generator Units do not pose as significant a Credit Risk in the market as it can reasonably be expected that they will be owed monies by SEM. There are only a few special cases where a Generator Unit can have been seen as posing a risk to the SEM which apply uniquely to certain types of Generator Units (Pumped Storage Hydro and Interconnector Units).

Section 6.245A of the Trading & Settlement Code allows for the Market Operator to remove Settlement Reallocation Agreements that result in a Participant with Generator Units becoming a debtor to the market. This minimises the risk of a Participant enter Reallocation Agreements greater than its earnings and thereby introducing elements of unsecured Credit Risk into the market. However, this clause will lapse 12 months after the market start date, after which time the Market Operator will not be permitted to take any such action.

As a result it will be possible that a Participant with Generator Units could end up as a debtor to the market. Section 6.244 of the Trading & Settlement prohibits Participants with Generator Units from reallocating beyond their expected payments. However, it is necessary that consideration is given to the possibility that a Participant with Generator Units basing their Reallocations on forecast data, may overestimated their expected earnings resulting in the Participant becoming a debtor to the market.

It is therefore proposed that a Fixed Credit Requirement of €10,000 is set for Generator Units.

Initial Credit Assessment Price

Taking the Plexus model that was used to derive the data used in the other models in this spreadsheet, the hourly System Marginal Prices were extracted for the period of the study (from November 1st 2007 to October 1st 2008).

A statistical analysis was carried out on three months of data from this study this study using the calculations as set out in sections 6.191 to 6.195. These resulted in an Average SMP value of €54.5525 and a Standard Deviation of €17.47. Using an Analysis Percentile Parameter of 1.96 as proposed above, this results in an Estimated Energy Price of €88.793.

Taking the proposed values of the Variable Market Operator Price (€0.609) and the Imperfections Price (€3.234 from the SMO Revenue Tariffs Consultation Paper (see document AIP-SEM-07-246), these values are added as per section 6.201 to yield a Credit Assessment Price for Billing Periods of €92.636.

As the Initial Credit Assessment Price is intended to cover all market exposures in SEM, the Estimated Capacity Price must also be added to the Credit Assessment Price for Billing Periods, giving a value of €102.816.

Estimated Capacity Price

The submitted Annual Load forecasts from the two TSOs that have already been provided were merged to a single load forecast for the market. Using the equations set out in the Code, the Fixed Capacity Payments Weighting Factor was then calculated for each Trading Period in the months of November 2007 and December 2007.

Assuming a VOLL of €7000 and SMPs derived from Plexus modelling (which averaged at €71.6236), a value of Capacity Payment Price Factor was calculated for each Trading Period as set out in the Code.

The combined load forecast was used as a proxy for the summed Net Demand for all Supplier Units to model the denominator in the equation for the calculation of Capacity Payment Demand Scaling Price using the published values of Capacity Period Payment Sum for November 2007 (€47,131,249) and December (€48,277,352). (See document AIP-SEM-07-188).

Using these values, a value of Capacity Payment Demand Price was calculated for each Trading Period. Using the calculations set out in the Code, sections 6.196 to 6.200, the Estimated Capacity Price was calculated as €10.18, where AnPP was set at 1.96 as proposed above and the Historical Assessment Period was based across the two months of available data.