# CREDIT LIMIT PROCEDURES – MODELLING PARAMETER AND MNSP PRUDENTIAL REQUIREMENT CHANGES

ISSUES PAPER

Published: **28 August 2017**

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

# EXECUTIVE SUMMARY

The publication of this Issues Paper commences the first stage of the consultation process conducted by AEMO to consider proposed amendments to the Credit Limit Procedures (CLP) under the National Electricity Rules (NER).

AEMO has prepared this Issues Paper to facilitate informed debate and feedback by industry about:

- Modelling parameter changes in the CLP.
- Changes to Market Network Service Provider (MNSP) prudential requirements in the CLP.

**Part A – Modelling parameter changes**

Examines the best way to amend the CLP so that market participant prudential requirements better reflect short- to- medium-term market conditions and ensure the 2% prudential standard is met.

In summary, the proposed amendments to the CLP are:

- Changing the weighting factor for average regional price ($W_{P,R}$) from 10% to 20%. This will give more weight to actual average regional prices than is currently the case.
- Changing the weighting factor for volatility factors ($W_{VF,R}$) from 10% to 20%. This will give more weight to actual volatility than is currently the case.
- Changing the capping factor (for price and volatility factors) from +/-10% to +/-20%. This will allow the weighting factor changes to take full effect in the model.

In a high price environment, these changes will increase market participant MCLs, better aligning them with short- to- medium-term market conditions and help to meet the 2% prudential standard.

**Part B - MNSP prudential requirements**

This part of the consultation outlines the proposed amendments to clause 10.3 of the CLP relating to the use of reallocations in calculating MNSP prudential requirements.

**Stakeholder input**

AEMO invites stakeholders to suggest alternative options that would achieve the relevant objectives for both Part A and Part B of this consultation. AEMO also asks stakeholders to identify any unintended adverse consequences of the proposed changes.

Stakeholders are invited to submit written responses on the issues and questions identified in this paper by 5.00 pm (Melbourne time) on 6 October 2017 in accordance with the Notice of First Stage of Consultation published with this paper.

# CONTENTS

# 1. STAKEHOLDER CONSULTATION PROCESS

As required by the NER, AEMO is consulting on changes to the Credit Limit Procedures (CLP) in accordance with the Rules consultation process in rule 8.9.

Note that there is a glossary of terms used in this Issues Paper at Appendix A.

AEMO's indicative timeline for this consultation is outlined below. Dates may be adjusted depending on the number and complexity of issues raised in submissions and any meetings with stakeholders.

| Deliverable | Indicative date |
|---|---|
| **Issues Paper published** | 28 August 2017 |
| **Submissions due on Issues Paper** | 6 October 2017 |
| **Draft Report published** | 27 October 2017 |
| **Submissions due on Draft Report** | 13 November 2017 |
| **Final Report published** | 1 December 2017 |

Prior to the submissions due date, stakeholders can request a meeting with AEMO to discuss the issues and proposed changes raised in this Issues Paper.

# 2. BACKGROUND

## 2.1 NER requirements

Under NER clause 3.3.8, AEMO is responsible for developing and publishing the CLP, which may be amended or replaced from time to time. The CLP may be amended in accordance with the 'rules consultation procedures' set out in NER rule 8.9.

## 2.2 Context for this consultation

The New Prudential Standard and Framework was implemented in 2012, and sits under Clause 3.3 of the NER. Its key features are outlined in the CLP[1], which has two main functions:

- To define the market's prudential risk appetite through the prudential standard.
- To determine the prudential settings for market participants with reference to the prudential standard. The prudential settings for a market participant comprise its maximum credit limit (MCL), outstandings limit (OSL) and prudential margin (PM). The MCL is the sum of the OSL and the PM. Market participants must provide AEMO with credit support for an amount greater than or equal to their MCL.

This consultation examines two separate issues relating to the CLP. The substantive topic, which most of this issues paper deals with, is proposed modelling parameter changes in the CLP, and is discussed in Section 3.

The second issue, relating to changes to MNSP prudential requirements, is discussed in Section 4.

[1] http://aemo.com.au/-/media/Files/PDF/Credit_Limit_Procedures_v2_Final_Determination_1_August.pdf

# 3. PART A – MODELLING PARAMETER CHANGES

## 3.1 The prudential standard

The prudential standard is the prudential probability of exceedance (POE), expressed as a percentage. The prudential standard is set at 2% (NER Clause 3.3.4A).

In practical terms, this means that the prudential arrangements establish a target of no payment shortfall in the market in 98 out of 100 instances of a retailer defaulting on their market payments, i.e., the retailer exceeds their outstandings limit, subsequently defaults, and is removed from the market. In the remaining two of 100 instances, AEMO would hold insufficient prudential collateral, resulting in a payment shortfall to the remaining market participants who are net creditors in the market (considering both energy and reallocations).

## 3.2 Market participant MCL

The CLP establish the process for determining the prudential settings and calculating credit support requirements for market participants to meet the prudential standard.

The key features of the methodology used are:

- MCL calculated over three seasons - summer, winter and shoulder.
- MCL accounting for seasonal differences in regional reference prices (RRP).
- MCL accounting for price and load volatility in each region through volatility factors (VFs).
- MCL as the sum of the outstandings limit (OSL) and the prudential margin (PM).
- The OSL time period ($T_{OSL}$) as 35 days and the PM time period ($T_{PM}$) as seven days.
- Use of Participant Risk Adjustment Factors (PRAFs) that express the relationship between regional load and each market participant's marginal loss factor (MLF) adjusted energy and reallocations. This is to adjust the OSL and PM to reflect the market participant's relative risk of their energy profiles.
- Smoothing of changes in market participant MCL requirements over corresponding seasons through weighting and capping factors. The approach considers seasonal data as a continuous series, over the lifespan of the National Electricity Market (NEM).
- For each region, calculating the level of volatility consistent with the 2% prudential standard, using historical regional load, RRP and relevant time period.

Table 1 summarises the key features of the CLP.[2]

[2] For a more detail on the workings of the CLP, refer to: http://aemo.com.au/-/media/Files/Electricity/NEM/Settlements_and_Payments/Prudentials/2017/CLPTraining.pdf

**Table 1 - CLP key features**

| Feature | Description/value |
|---|---|
| **Definition of standard** | Prudential Probability of Exceedance (POE) |
| **Relevant time period for MCL** | 42 days (35 days outstanding period plus 7 days reaction period) |
| **Measure of standard** | 2% POE target |
| **MCL** | MCL = Outstandings Limit + Prudential Margin |
| **Basis of OSL and PM** | Price x load x volatility OSL x 35 days<br>Price x load x volatility PM x 7 days |
| **Variance of MCL over the year** | By season |
| **Regions** | MCL calculations are regionally based (NSW, QLD,SA,TAS & VIC) |
| **Regional Reference price (RRP) used** | Average price from NEM start for applicable season in each region |
| **Volatility Factors (VF)** | Volatility factor from NEM start for applicable season in each region |
| **Volatility Factor percentiles** | Calculated to meet the 2% prudential standard |
| **Participant differentiation** | Participants differentiated by energy – load, generation and reallocations and their respective profiles. |
| **PRAF** | Express the relationship between regional load/generation and the market participant's marginal loss factor (MLF) adjusted load/generation |
| **Weighting factor – average regional load** | 70% |
| **Weighting factor – average regional price** | 10% |
| **Capping factor (price and volatility factors)** | +/- 10% |

## 3.3 2017 CLP review

Under clause 3.3.8(f)) of the NER, AEMO is required to annually review and publish its findings on the effectiveness of the CLP. The 2017 review found that with the inclusion of settlement data up to 30 November 2016, the 2% prudential standard was not met for all regions. The exceedance was mainly caused by actual electricity prices being significantly higher than forecast electricity prices, which are used to determine market participant MCLs.

In light of the prudential standard not being met, together with continuing high prices and volatility in the electricity market, AEMO decided to:

1) Re-calibrate the CLP model by recalculating the volatility factor (VF) percentiles for each region to meet the 2% prudential standard. This has been completed and the new VF percentiles will be used for MCL reviews conducted from the beginning of September 2017.
2) Undertake a review to assess the adequacy of the CLP methodology and AEMO's ability to calibrate it to meet the prudential standard. As a result of this assessment, AEMO is undertaking this consultation on proposed changes to key modelling parameters.

## 3.4 Current market conditions and the CLP methodology

Since 2015, but particularly over the past year, there has been a sharp increase in electricity prices in all regions. The Australian Energy Regulator (AER), in its State of the Energy Market Report published in May 2017[3], made the following key observations:

[3] AER (2017) State of the Energy Market, available at: https://www.aer.gov.au/system/files/AER%20State%20of%20the%20energy%20market%202017%20-%20A4.pdf

- The electricity market has been extremely volatile since the winter of 2015 and rising demand and a contraction in supply contributed to tight market conditions.
- There have been an unprecedented number off spikes in wholesale prices in mainland NEM regions during winter 2016 and over summer 2016–17.
- Events such as the closure of Hazelwood Power Station have led to escalating electricity futures prices, as the market factored in reduced supply on top of already tight market conditions.
- Beyond 2018, NEM prices are expected to soften to around $80–90 per MWh by 2020, still significantly above historical prices for most regions.

The CLP has been in place for more than three years. Its statistical approach is based on smoothing changes in market participants' required MCLs from one season to the corresponding season in the following year, resulting from one-off changes to average prices and regional volatility, while responding to longer-term trend changes. This smoothing is achieved through setting the weighting and capping factors for price, load and volatility.

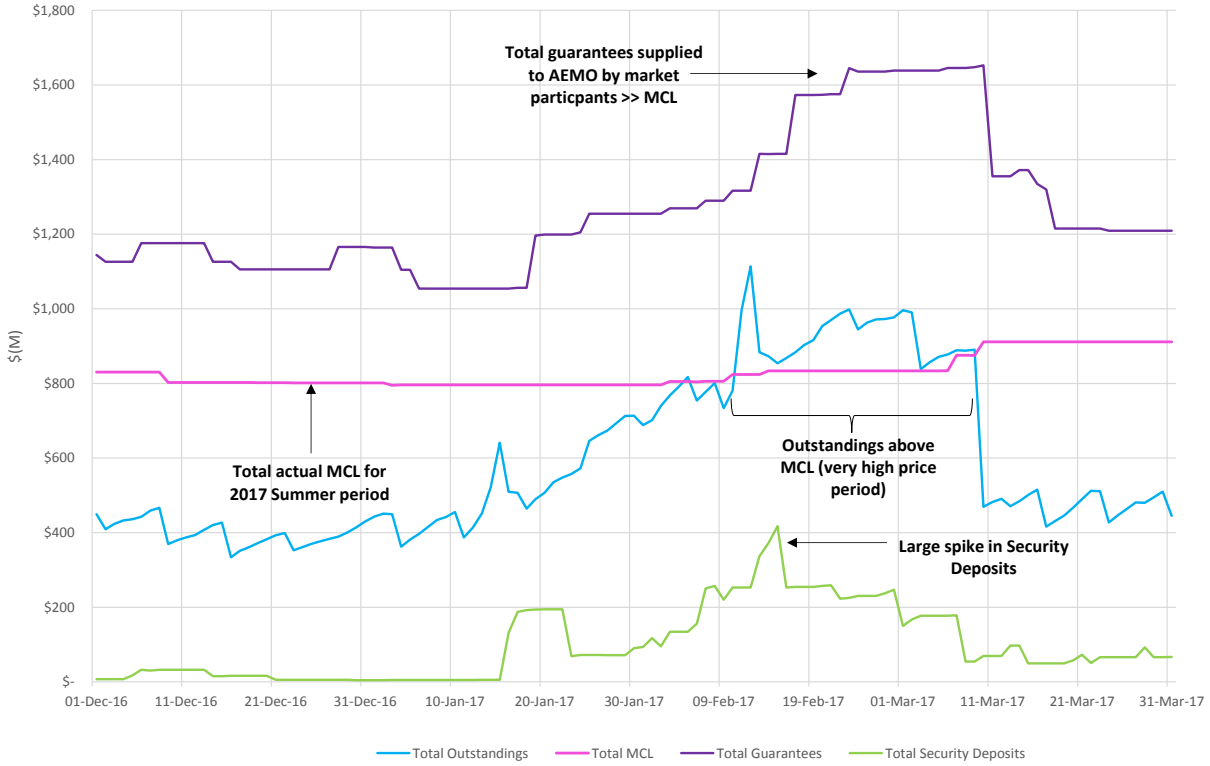
When electricity price rises are sudden and large (as is now the case), this methodology results in forecast average regional prices not reflecting (currently being significantly lower than) current actual regional average prices. As the forecast regional average price is a key parameter in determining market participant MCLs, lower forecast average regional prices lead to lower MCL levels. This effect would not be problematic if recent electricity price rises were the result of one-off changes or events (e.g. an unusual heatwave). However, as indicated by the AER, the current high price environment is likely to continue in the short- to- medium-term.

With the inherent lag built into the CLP through the current parameter settings, if the model parameters remain unchanged, the CLP methodology will continue to generate forecast average regional prices that are significantly lower than actual average regional prices. With MCL levels not set at levels in line with market conditions, the 2% prudential standard will remain unmet. It is not unusual or unexpected for the 2% prudential standard to be unmet in some years. However, it is important that AEMO maintains prudential risks close to the prudential standard in most years, protecting the market from the risk of loss from default.

Low MCL levels in a high price environment also have practical implications for both market participants and AEMO. To illustrate this, the key prudential indicators for the 2017 summer season are shown in Figure 1. The following observations can be made:

- Total outstandings were above total MCL levels for a significant time period between mid-February and mid-March.
- There were a significant number of trading limit breaches over a prolonged time, requiring the provision of large number of security deposits.
- Many market participants provided AEMO with guarantees above their required MCL from the start of the season (indicating their belief the MCL requirements would not be adequate), with additional guarantees provided over the high price period.
- There is a clear indication from both the level of guarantees voluntarily supplied to AEMO and the amount of security deposits that MCL levels were set at levels not in line with market conditions.

**Figure 1 – Total outstandings, MCL, Guarantees and security deposits for the 2017 summer season**




Note: Small variations in MCL over the season represent 'ad-hoc' MCL reviews undertaken for change in load, generation or reallocations.

## 3.5 CLP parameters for review

### 3.5.1 The Life of NEM Model

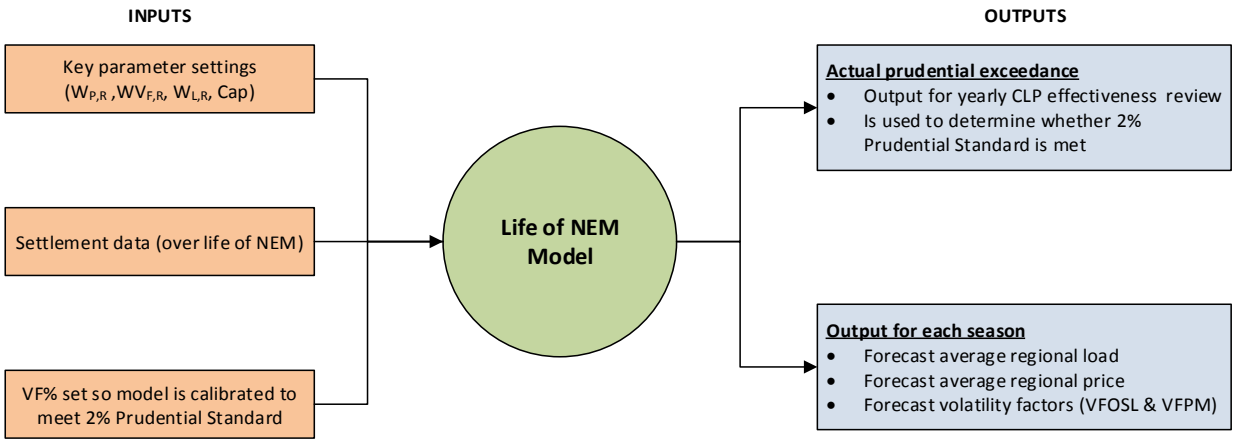
In line with the CLP, AEMO has developed a regional model, referred to as the "Life of NEM" model (see Figure 2 below). This model is calibrated to meet the 2% prudential standard in each region by adjusting the VF percentile and assessing regional outstandings against MCL levels to determine the level of prudential exceedance. The model is based on three seasons; winter (May to August), summer (December to March) and shoulder (April, and September to November), and runs from December 1999 for the NSW, QLD, SA and VIC regions, and April 2006 for the TAS region (when the region joined the NEM).

The outputs of this model include the volatility factors for the outstandings limit and prudential margin (VFOSL and VFPM) and forecast loads and prices that are then used to calculate market participant MCL. The model outputs are used to determine the maximum credit limit (MCL) for market participants by summing the market participant outstandings limit (OSL) and prudential margin (PM) according to the formula:

$$MCL = OSL + PM$$

The OSL reflects the credit support required to cover liabilities for energy consumed but not paid over the 35 day outstandings period. The PM reflects the credit support buffer intended to cover accruing liabilities in the NEM during the seven day reaction period.

**Figure 2 – Life of NEM model inputs and outputs**




Within the CLP, there are four key parameters that allow the Life of NEM model to be adjusted (see Table 2). The parameter values were derived when the CLP was introduced, based on historical analysis of actual market data. The CLP indicates that these parameters will be periodically reviewed by AEMO and adjusted following consultation with market participants.

**Table 2 – Key MCL modelling parameters**

| Parameter | Parameter description/current value |
|---|---|
| **Weighting factor for average regional price ($W_{P,R}$)** | Set at 10% - the forecast price for the region takes into account 10% of the previous like season's actual regional price, and 90% of the previous like seasons regional forecast price.[4] |
| **Weighting factor for volatility factors for OSL and PM ($WV_{F,R}$)** | Set at 10% - the forecast volatility factors for the region take into account 10% of the previous like season's actual regional volatility, and 90% of the previous like seasons regional forecast volatility.[5] |
| **Capping factor (price and volatility factors)** | Set at +/-10% - where the change in price or volatility from one season to the corresponding season in the following year is more than 10%, then the change in the value is restricted to an increase/decrease of 10%. |
| **Weighting factor for average regional load ($W_{L,R}$)** | Set at 70% - the forecast load takes into account 70% of the previous like season's regional actual load, and 30% of the previous like seasons forecast regional load.[6] |

### 3.5.2 Weighting factor for average regional price ($W_{P,R}$)

The methodology for setting market participant MCL levels relies on regional forecast prices derived from previous 'like season' actual prices. For a description of the use of the weighting factor for average regional price ($W_{P,R}$) in MCL calculations, refer to section 9.2.2 of the CLP.

Currently, the forecast average price for any season is made up of 10% ($W_{P,R}$) of the previous like season actual price, and 90% of the previous like season forecast price.

For example, for summer 2018, the forecast average prices ($P_R$) for each region would be set according to the formula:

$$P_{R\ (sum18)} = 10\%\ Actual\ \text{average}\ price_{sum17} + \ 90\%\ P_{R(sum17)}$$

[4] The forecast average regional price is therefore base on an exponential weighting of prior like season actual regional prices.
[5] The forecast average regional volatility factors are therefore base on an exponential weighting of prior like season actual regional volatility factors.
[6] The forecast average regional load is therefore base on an exponential weighting of prior like season actual regional loads.

Changing this weighting factor will change how rising actual prices are reflected in forecast prices, and this impact is investigated in various scenarios described in Section 3.6.3.

Please note that $W_{P,R}$ is also used in calculating the half-hourly regional price (PHH,R) profile and the half-hourly regional price (PHH,R,C) profile for cap value C (see CLP sections 9.3.2 and 9.3.3). Any changes to $W_{P,R}$ will flow through to these calculations.

### 3.5.3 Weighting factor for volatility factors for OSL and PM ($W_{VF,R}$)

Volatility factors reflect the variability in the level of outstandings (volatility) for a given region and are set in line with the prudential standard. There are two volatility factors used in determining market participant MCLs, the outstandings limit volatility factor (VFOSL) and the prudential margin volatility factor (VFPM). The VFOSL and the VFPM are derived from the distribution of the estimated load and estimated regional reference price on a rolling 35 day and a rolling seven day basis respectively. For a description of the use of the weighting factor for volatility factors ($W_{VF,R}$) in MCL calculations, refer to CLP sections 9.3.4 and 9.3.5.

The methodology for the volatility factors is very similar to that for average regional prices, that is, the volatility factors for any season are made up of 10% ($W_{VF,R}$) of the previous like season volatility factor, and 90% of the previous like season actual volatility factor.

For example, for summer 2018, the volatility factors for each region would be set according to the formulas:

$$VFOSL_{sum18} = 10\%\ Actual\ OSL\ volatility\ factor_{sum17} + 90\%\ VFOSL_{sum17}$$

$$VFPM_{sum18} = 10\%\ Actual\ \text{PM}\ volatility\ factor_{sum17} + 90\%\ VFPM_{sum17}$$

Changing this weighting factor will change how increasing actual volatility is reflected in forecast volatility, and this impact is investigated in various scenarios described in Section 3.6.3.

### 3.5.4 Capping factor (price and volatility factors)

Any rise or fall of regional forecast average price or volatility factors from one season to the next is capped at 10% (capping parameter) in the CLP.

Changing this capping factor will change how increasing actual prices and volatilities are reflected in forecast prices and volatilities, and this impact is investigated in various scenarios as described in Section 3.6.3.

### 3.5.5 Weighting factor for average regional load ($W_{L,R}$)

The 70% weighting factor for load means that a significant portion (70%) of the forecast average regional load is made up of the actual regional load value from the previous like season. The forecast and actual average regional loads have not varied significantly since the start of the CLP. As such, AEMO considers that this weighting factor is working well, and changes to this parameter are not being proposed.

## 3.6 Proposed Changes

### 3.6.1 Credit Limit Procedures

This section describes the material amendments proposed to the *Credit Limit Procedures*, for consultation. Minor editorial amendments have not been noted in this Issues Paper, but a full change-marked version has been published with this Issues Paper.

### 3.6.2 Analysis

As noted in Section 3.3, AEMO completed its annual review of the effectiveness of the CLP in March 2017, which determined that the prudential standard was not met for 2016. In addition, current market

conditions featuring high electricity prices and high volatility are considered likely to continue in the short- to- medium- term. As a result, AEMO determined that adjustments are required to some of the key parameters within the CLP to ensure that prudential risk is appropriately managed.

AEMO conducted analysis (outlined in Section 3.6.3 below) to help identify the best combination of parameter adjustments to allow the CLP to:

- Ensure that prudential requirements are set to meet the prudential standard.
- Better reflect the short to medium term market conditions in setting MCLs.

A selection of illustrative scenarios, and the reasoning for the preferred option are presented below.

### 3.6.3 Scenarios investigated

Changes to parameters in the Life of NEM model are applied over the models entire timeframe, with adjustments to weighting/capping factors changing the prices and volatility factors in each region, for each season, and for all years. Due to the models complexity and the interaction between parameters, the outcomes from parameter changes are non-linear. Additionally, meeting the prudential standard and increasing MCLs to better align with short to medium term market conditions are not necessarily achieved through the same parameter settings.

For this reason, a large number of scenarios were investigated, representing a combination of CLP parameter changes.[7] Table 3 outlines the general observations made regarding the effect of parameter changes on prudential exceedance and MCL levels.

**Table 3 - General observations on parameter changes**

| Parameter change | Effect on prudential exceedance | Effect on MCL |
|---|---|---|
| **Increasing weighting factor for average regional price ($W_{P,R}$)** | • Increases prudential exceedance.<br>• Larger the weighting factor, larger the increase in prudential exceedance. | • Increases MCL levels.<br>• Larger the weighting factor, larger the increase in MCL. |
| **Increasing weighting factor for volatility factors for OSL and PM ($WV_{F,R}$)** | • Small to no effect on prudential exceedance. | • Increases MCL levels but has smaller effect than increases to $W_{P,R}$. |
| **Increasing capping factor (price and volatility factors)** | • Reduces prudential exceedance slightly. | • Increases MCL levels as allows any increases from the weighting factor changes to be fully captured. |

A few key scenarios were chosen to illustrate the effects on both prudential exceedance and MCL levels (see

[7] The VF percentile changes that have resulted in the CLP recalibration have now been implemented (effective from 5 September 2017). These new VF percentiles were used for all scenarios. Please refer to: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Settlements-and-payments/Prudentials-and-payments/Maximum-Credit-Limit/Credit_Limit_Procedures_Supporting_Information

Table 4 below). Additionally, a scenario with a 50 $/MWh step change for forecast average regional prices was also modelled to get an understanding of the MCL increases such a change would entail.

**Table 4 – Example scenarios**

| | $W_{P,R}$ | $W_{VF,R}$ | Cap | VFOSL/VFPM | $P_R$ |
|---|---|---|---|---|---|
| **Low Scenario: W(P)=20%, W(VF)=20%, C=+/-20%** | 20% | 20% | +/-20% | Model output for summer 2018 | Model output, summer 2018 |
| **Medium Scenario: W(P)=30%, W(VF)=30%, C=+/-30%** | 30% | 30% | +/-30% | Model output for summer 2018 | Model output, summer 2018 |
| **High Scenario: W(P)=50%, W(VF)=50%, C=+/-50%** | 50% | 50% | +/-50% | Model output for summer 2018 | Model output, summer 2018 |
| **Scenario: Step change in price of 50 $/MWh[8]** | 10% | 10% | +/-10% | Model output for summer 2018 | Model output, summer 2018 |

The effect on the prudential exceedance of each of the scenarios is shown in

Table 5. The scenario that comes closest to meeting the prudential standard is the low scenario (weighting and capping factors set at 20%). The scenario that leads to the largest prudential exceedance is the high scenario (weighting and capping factors set at 50%).

**Table 5 – Prudential exceedance under scenarios investigated[9]**

| | Scenario: W(P)=20%, W(VF)=20%, C=+/-20% | Scenario: W(P)=30%, W(VF)=30%, C=+/-30% | Scenario: W(P)=50%, W(VF)=50%, C=+/-50% |
|---|---|---|---|
| **NSW** | 2.1% | 2.5% | 2.8% |
| **QLD** | 2.5% | 2.6% | 3.0% |
| **SA** | 1.9% | 2.0% | 2.1% |
| **TAS** | 4.6% | 5.1% | 5.4% |
| **VIC** | 2.1% | 2.1% | 2.3% |

Note: the step change in price scenario does not result in a change of prudential exceedance as it's not modelled through the Life of NEM model.

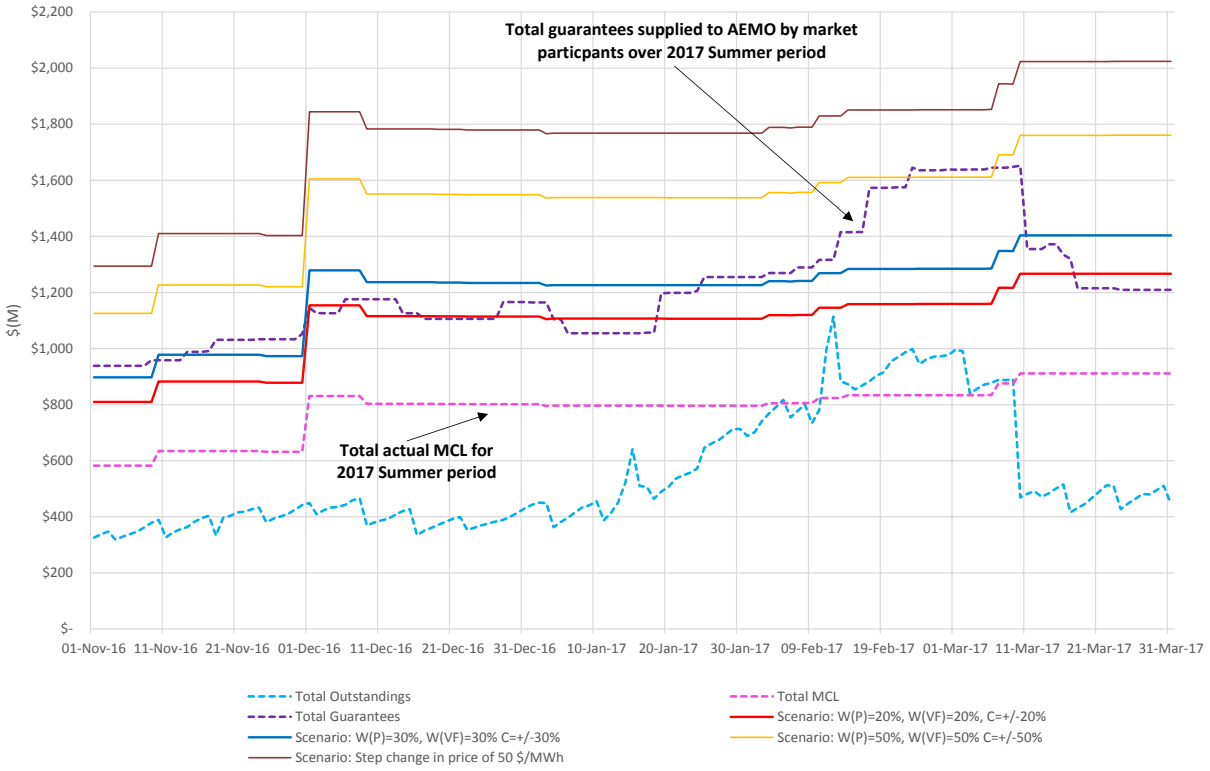
To get an understanding of the effect of the parameter changes on total MCL levels, the level of total MCL for the 2017 summer season was compared to the total MCL for 2017 summer under each of the scenarios (see Figure 3). The following key observations can be made:

- Adjusting the three key parameters can result in a wide range of changes to MCL levels.
- The most significant increase in MCL is from the step change in price scenario, followed by the high scenario (weighting and capping factors set to 50%). Both of these scenarios result in total MCL levels that are mostly higher than total guarantees (required and voluntary).
- Both the low (weighting/capping factors set to 20%) and medium (weighting/capping factors set to 30%) scenarios result in MCL levels just above the high point of total outstandings and that also closely track the total guarantees (required and voluntary) for much of the 2017 summer season.

[8] The scenario was not run through the CLP model, but rather 50$/MWh was added to the forecast average regional prices for the MCL calculations. The purpose of this scenario is to give an estimate of the sort of MCL increases that could have been expected if forecast prices were 50$/MWh higher than the 2017 summer forecast average regional prices.

[9] Using settlement data to 31 March 2017 and updated VF percentiles.

**Figure 3 - Effects of various scenario parameter changes on total MCL for the 2017 summer season**




### 3.6.4 Proposed changes

Determining the optimal combination of parameter changes to achieve the objectives is tricky, as the parameters interact in a non-linear way within the Life of NEM model, and the dual aim of meeting the prudential standard and ensuring MCLs reflect short-to-medium-term market conditions are not necessarily achieved through the same combination of parameter changes.

Looking at the results from the prudential standard modelling (

Table 5) and MCL modelling (Figure 3) both the low or medium scenarios were deemed close to meeting the objectives. The low scenario was closer to meeting the prudential standard but had a smaller increase in MCL levels, while the medium scenario had a higher prudential exceedance, but MCL levels increases were smaller.

Determining exactly what increase in total MCL level would be appropriate is difficult. While not a indicator, comparing total MCL levels to total outstandings provides a rough guide as to the level below which total MCLs should not fall. Another reference point is the level of total guarantees (both required and voluntary) that AEMO holds. Looking at

Figure 6, it can be seen that, in general, MCL levels (when prices are stable) sit somewhere between total outstandings and total guarantees.

Considering all of these aspects, the parameter changes under the low scenario (weighting factors of 20% and capping factor of +/-20%) were deemed the most appropriate, as they resulted in acceptable levels of prudential exceedance and raised the total MCL levels deemed to be reflective of short-to-medium-term market conditions.

In addition, the proposed parameter changes represent an incremental change to the CLP, and are seen as a way of maintaining the overall methodological approach of the CLP while still responding to changing market conditions.

The effect of these changes will be monitored by AEMO and reported through the annual CLP Effectiveness Reviews. If the changes either result in the prudential standard not being met or MCL levels not aligning with market conditions (either too low or too high), further changes will be considered.

The proposed changes, with calculation examples are summarised in Table 6.

**Table 6 – Proposed CLP parameter changes**

| Feature | Current value | Proposed value | Recommendation |
|---|---|---|---|
| **Weighting factor for average regional price ($W_{P,R}$)** | 10% | 20% | **Recommendation to change $W_{P,R}$ to 20%**<br>Analysis indicates that adjusting this parameter appropriately allows MCLs to more closely reflect market conditions in the short to medium term.<br>Calculation example summer 2018:<br>$$P_{R\,(sum18)} = 20\%\ Actual\ average\ \ price_{sum17} + \ 80\%\ P_{R(sum17)}$$ |
| **Weighting factor for volatility factors for OSL and PM ($W_{VF,R}$)** | 10% | 20% | **Recommendation to change $W_{VF,R}$ to 20%**<br>Analysis indicates that adjusting this parameter appropriately allows MCLs to more closely reflect market conditions in the short to medium term.<br>Calculation examples, summer 2018:<br>$$VFOSL_{sum18} = 20\%\ Actual\ \text{OSL}\ volatility\ factor_{sum17} + \ 20\%\ VFOSL_{sum17}$$<br>$$VFPM_{sum18} = 20\%\ Actual\ \text{PM}\ volatility\ factor_{sum17} + \ 20\%\ VFPM_{sum17}$$ |
| **Capping factor (price and volatility factors)** | +/-10% | +/-20% | **Recommendation to change capping factor to +/-20%**<br>Raising the capping factor to +/-20%, allow the effect of the weighting factor changes to be fully captured. Thus, any rise or fall of forecast average price or volatility factor from one season to the next would be capped at 20% in the CLP. |

### 3.6.5 The other scenarios

The high scenario did not meet the objectives of meeting the prudential standard and increasing the MCL levels to align with short-to-medium-term market conditions. It resulted in prudential exceedance levels that were an increase on the 2017 CLP Effectiveness Review value, and total MCL levels increases judged to be too large.

The step change in price scenario also delivered a large increase in MCL levels. However, as implementing such a change would be outside the CLP methodology, it was not deemed to be appropriate at this time.

## 3.7 Effects of the proposed parameter changes

### 3.7.1 Prudential Standard

Under the proposed parameter changes, the actual prudential exceedance is reduced from that reported in the 2017 CLP Effectiveness Review (see Table 7). While the prudential exceedance remains above the 2% prudential standard in most regions, it is on a downward trajectory.

**Table 7 – Implication for the prudential standard from the proposed parameter changes**

| Region | Prudential Standard target | Actual prudential exceedance | Actual prudential exceedance under proposed changes |
|---|---|---|---|
| | | 2016 (data to 30 November 2016) | 2017 (data to 31 march 2017) |
| NSW | 2.0% | 2.3% | 2.1% |
| QLD | 2.0% | 2.6% | 2.5% |
| SA | 2.0% | 2.2% | 1.9% |
| TAS | 2.0% | 5.2% | 4.6% |
| VIC | 2.0% | 2.1% | 2.1% |

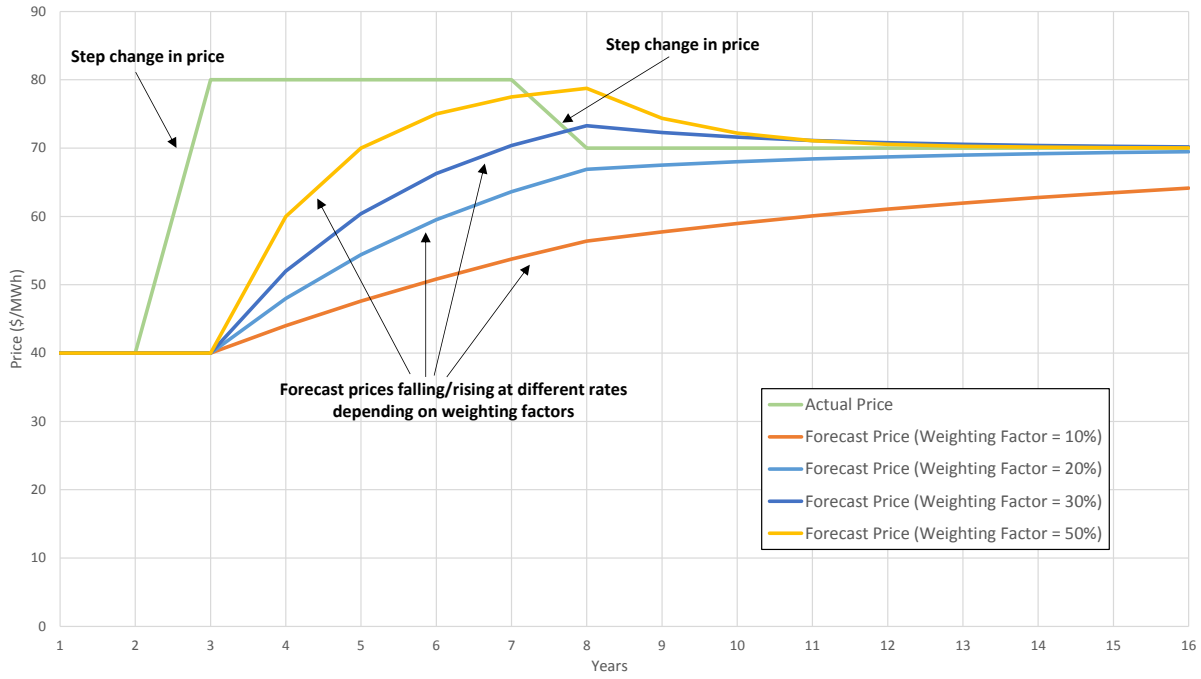
### 3.7.2 Total MCL levels

In terms of total MCL levels, the main effect of the proposed parameter changes will be to give more weight to actual prices and volatility than is currently the case, and allow for larger changes in forecast prices or volatility from one season to the next corresponding season. Thus, forecast prices will more closely align with actual market prices and the volatility factors will more closely align with actual volatility factors than is currently the case. In the short-to-medium-term while prices are high, these changes will increase market participant MCLs, aligning them with market conditions.

If actual prices remain high, the forecast prices will be more reflective of actual prices, and hence will be higher, than if the current price weighting factor remained in place. Similarly, if actual volatility remains high, the forecast volatility will be more reflective of actual volatility, and hence will be higher, than if the current volatility weighting factors remained in place. Higher prices and/or higher volatility factors will mean an increased MCL, which is more reflective of short- to- medium-term market conditions, for market participants.

This increased responsiveness will also work in reverse, i.e. if actual prices or volatility drop, market participant MCLs will be quicker to fall than would be the case under the current weighting factors. However as shown in Figure 4, there will still be significant lag built into the CLP, and large increases/decreases in MCLs will still be avoided from one season to the next like season.

**Figure 4 – Illustrative effects of changing weighting factors for price and the lag of forecast prices catching up to actual prices**

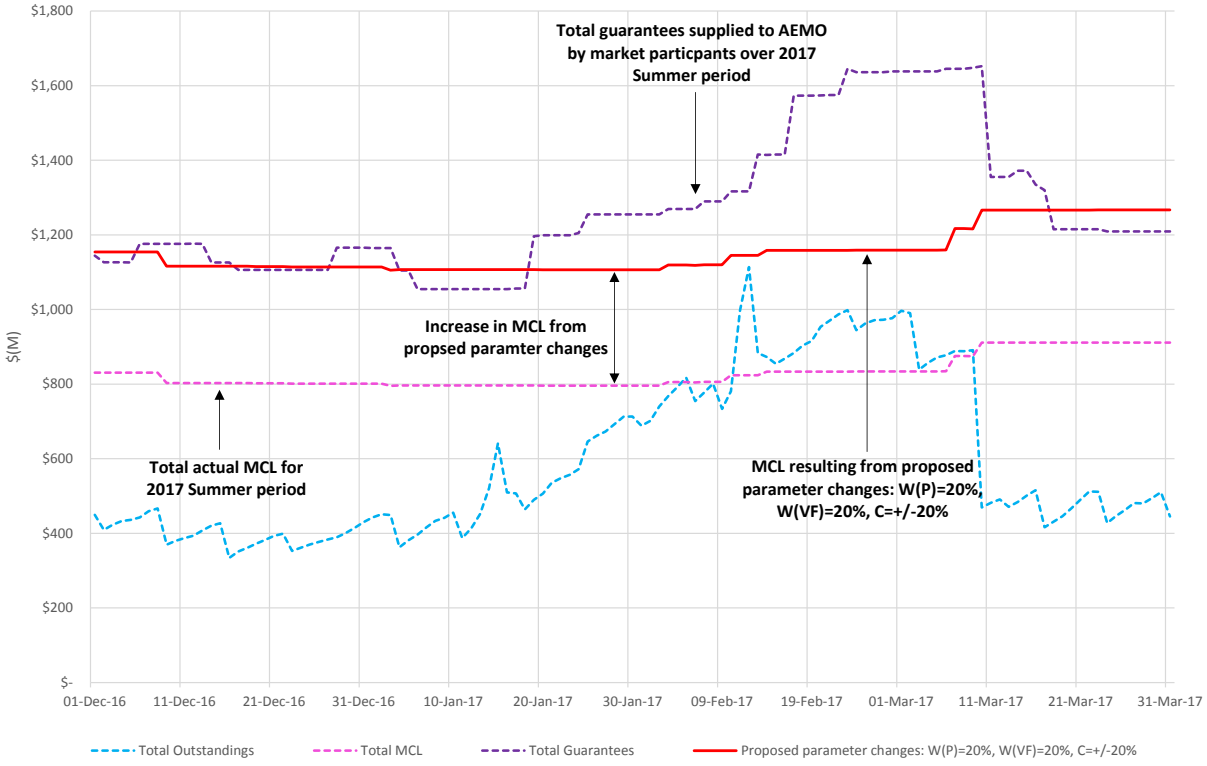



The proposed changes will not affect the overarching statistical approach of the CLP. MCLs will still be smoothed from one season to the corresponding season in the following year resulting from one-off changes to average prices and regional volatility, while responding to longer-term trend changes.

To get a better understanding of the effects of the proposed parameter changes, the prices and volatility factors resulting from the proposed parameter changes were applied to prudential data from the 2017 summer season. The increase in MCL and a comparison to the prudential indicators for the 2017 summer season are shown in Figure 5. The following key observations can be made:

- The increase on total MCL levels for the 2017 summer season under the proposed parameter changes would be approximately 40%.
- The total MCL would have been above the total outstandings for the entire season.
- The higher total MCL would have resulted in higher trading limits for market participants, leading to significantly fewer trading limit breaches. AEMO estimates that up to 30% to 40% of trading limit breaches on days with particularly high prices and thus outstandings, would have been eliminated.
- The total MCL for the proposed parameter changes would have been similar to the total guarantees (required and voluntarily supplied) for over half of the summer season (apart from the mid-February to mid-March period).
- For the very high price periods such as those from around mid-February to mid-March, it would be expected that market participants provide AEMO security deposits to deal with any trading limit breaches.

**Figure 5 – Effects of proposed parameter changes on total MCL for the 2017 summer season**

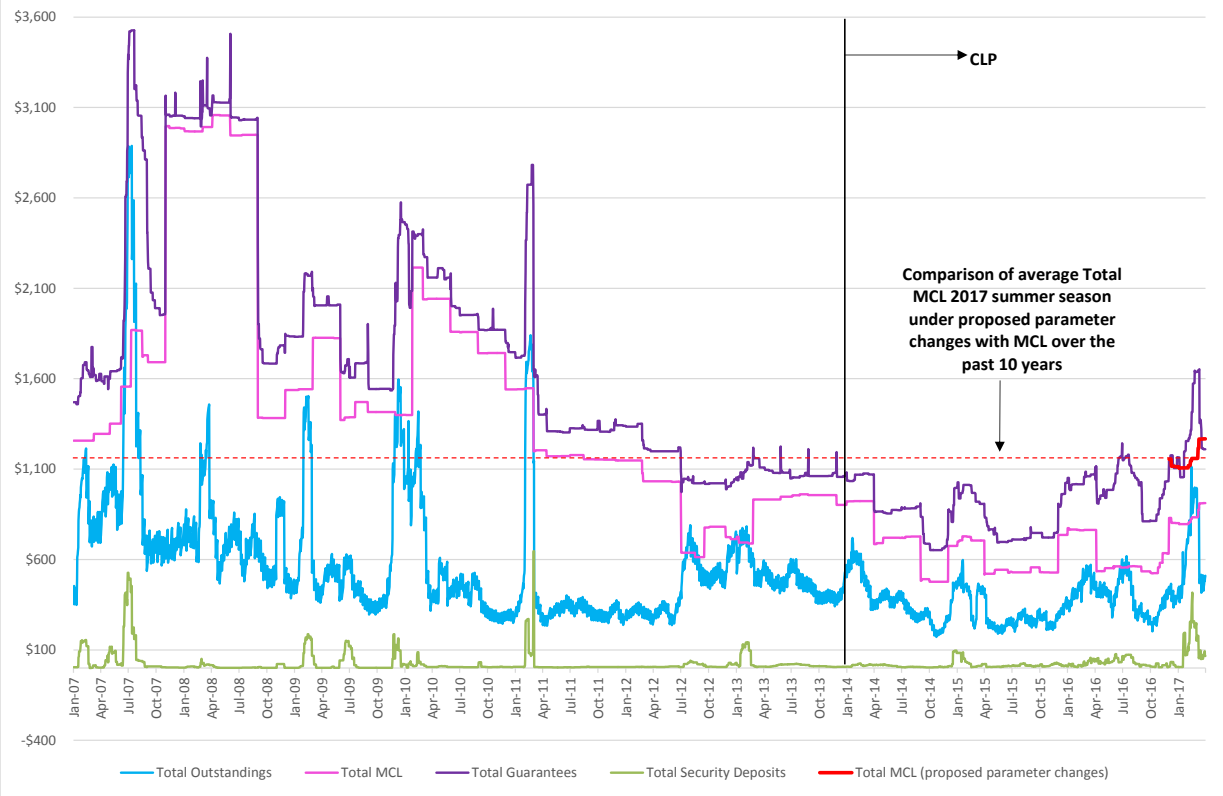



For a contextual understanding of the proposed parameter changes, the key prudential indicators over the past ten years are shown in

Figure 6. The following observations can be made:

- Prudential indicators fluctuate over a wide range of values over time (both from season to season and over years).
- In general, MCL requirements have been lower and smoother between corresponding seasons since the CLP was introduced.
- The total MCL resulting from the proposed parameter changes for the 2017 summer season (the average of which is indicated by the dashed red line) could not be considered high, compared to similar levels of outstandings in other years.

**Figure 6 – Prudential parameters 2007-2017**




### 3.7.3 Benefits for market participants

Setting market participant MCL levels to be more reflective of short- to- medium-term market conditions has the following key benefits:

- Maintains prudential risks within the bounds of the prudential standard, protecting the market from the risk of loss from default.
- Allows market participants to access the appropriate level of credit support from their credit support provider.
- More accurately portrays the likely financial obligations of market participants (i.e. their likely level of outstandings).
- Reduces the need for provision of credit support in excess of MCL (i.e. guarantees provided to AEMO voluntarily by market participants).
- Reduces the required operational effort both from AEMO and market participants in relation to dealing with a large number of trading limit breaches and the provision of security deposits.

**Questions**

- Are there other changes to the CLP that could ensure that MCLs are reflective of short- to-medium-term market conditions?
- Are there any issues you foresee in implementing these proposed changes in your organisation?

# 4. PART B - MNSP PRUDENTIAL REQUIREMENTS

## 4.1 Current treatment of MNSPs

AEMO recently conducted a consultation on changes to the CLP, with the Final Report and Determination (Credit Limit Procedures: Application of Offsets in the Prudential Margin Calculation Consultation[10]) published on 30 June 2017. Through this consultation, a new clause (10.3) was inserted into the CLP that provided for the determination of an MCL amount for MNSPs.

Historically the estimated load and estimated generation for a MNSP was assigned as zero in MCL calculations. This was based on the theory that MNSPs would typically operate so that energy is dispatched from one region to another in a direction and at times that lead to positive surplus settlement residue accrual and a credit in the MNSP's settlement account. As a result, MNSPs were not required to provide credit support in the NEM.

More recently however, AEMO has noted that MNSP services are frequently dispatched in a direction that causes a negative settlement residue to accrue. This change in MNSP behaviour resulted in a prudential risk inconsistent with the prudential standard.

To manage this risk, and due to the lack of a strong correlation between MNSP dispatch and regional pricing, AEMO amended the CLP so that the OSL for an MNSP is set at the value of the highest unpaid liability accrued by the MNSP period in the previous 12 month period, and the PM is set at 20 percent of the OSL. Like other market participants, for periods where an MNSP's outstandings are higher than its MCL, the MNSP is required to provide a cash deposit to AEMO to manage its prudential position.

## 4.2 Proposed changes

It is proposed that clause 10.3 of the CLP is amended to allow MNSPs to use reallocations, to give MNSPs greater flexibility in meeting their prudential requirements. Table 8 outlines the current and proposed wording for clause 10.3 of the CLP.

The proposed change gives a value for the reallocations an MNSP has, and adds it onto the highest liabilities value for energy. If the reallocation value is negative (i.e. it is a credit reallocation), the highest liability value for energy is reduced.

[10] Available at: https://aemo.com.au/Stakeholder-Consultation/Consultations/Credit-Limit-Procedures--Application-of-offsets-in-the-Prudential-Margin-calculation

**Table 8 – Proposed changes to clause 10.3 of the CLP**

| Current wording in the CLP | Proposed wording |
|---|---|
| 10.3. Maximum Credit Limit for Market Network Service Providers<br><br>The MCL for a *Market Network Service Provider* (MNSP) is OSL + PM, where:<br><br>(a) OSL (for $T_{OSL}$) is set at the value of the highest unpaid liability accrued by the MNSP in the 12 month period preceding the time of calculation; and<br><br>(b) PM (for $T_{RP}$) is a value equal to 20% of the OSL. | 10.3. Maximum Credit Limit for Market Network Service Providers<br><br>(a) The MCL for a *Market Network Service Provider* (MNSP) is OSL + PM where, subject to paragraph (b):<br><br>(i) OSL (for $T_{OSL}$) is set at the value of the highest unpaid liability accrued by the MNSP in the 12 month period preceding the time of calculation, disregarding the impact of reallocations; and<br><br>(ii) PM (for $T_{RP}$) is a value equal to 20% of the OSL.<br><br>(b) The values of OSL and PM will be adjusted to account for any *reallocation transactions* to which the MNSP is a party, by applying the adjustment calculations relating to the values of VRD and VRC, and associated values and terms, in clause 5 (for OSL) and clause 6 (for PM). To avoid doubt, no adjustments are to be made in relation to estimated *load* (VEL) or estimated *generation* (VEG). |

**Example Calculation 1**

Highest unpaid liability (not taking into account reallocations) = $1.0 Million

Credit Reallocations = $0.5 Million

OSL = $1.0M - $0.5M

PM = 20% x ($1.0M - $0.5M)

$MCL_{MNSP}$ = $0.5M + $0.1M

$MCL_{MNSP}$ = $0.6 Million

**Example Calculation 2**

Highest unpaid liability (not taking into account reallocations) = $1.0 Million

Debit Reallocations = $0.5 Million

OSL = $1.0M + $0.5M

PM = 20% x ($1.0M+$0.5M)

$MCL_{MNSP}$ = $1.5M + $0.3M

$MCL_{MNSP}$ = $1.8 Million

## 4.3 Effects of the proposed parameter changes

The proposed changes give MSNPs additional flexibility in meeting their prudential requirements. The changes do not affect any other market participant and do not have any material impact on the prudential risks within the NEM.

**Questions**

- Are there any issues you foresee in implementing the proposed changes in relation to MNSPs on the market, or on your organisation?

# 5. DRAFTING FOR PROPOSED CHANGES

To help stakeholders and other interested parties respond to this Issues Paper, AEMO has published a draft of the Credit Limit Procedures incorporating the changes (Part A and Part B) AEMO proposes for consultation. Clean and change-marked versions are available at:

https://aemo.com.au/Stakeholder-Consultation/Consultations/CLP-Modelling-Parameter-and-MNSP-Prudential-Requirement-Changes

# 6. SUMMARY OF MATTERS FOR CONSULTATION

In summary, AEMO seeks comment and feedback on two separate issues:

**Part A – Modelling parameter changes**

- Proposed change of the weighting factor for average regional price ($W_{P,R}$) from 10% to 20%.
- Proposed change of the weighting factor for volatility factors ($W_{VF,R}$) from 10% to 20%.
- Proposed change of the capping factor (for price and volatility factors) from +/-10% to +/-20%.

**Part B - MNSP prudential requirements**

- Proposed amendments to clause 10.3 of the CLP to allow MNSPs to use reallocation to meet their prudential requirements.

Submissions on these and any other matter relating to the proposal discussed in this Issues Paper must be made in accordance with the Notice of First Stage of Consultation published with this paper.

# APPENDIX A - GLOSSARY

| Term or acronym | Meaning |
|---|---|
| CLP | credit limit procedures |
| MCL | maximum credit limit |
| MLF | marginal loss factor |
| MNSP | Market Network Service Provider |
| NER | National Electricity Rules |
| OSL | outstandings limit |
| PM | prudential margin |
| PRAFs | participant risk adjustment factors |
| RRP | regional reference prices |
| VF | volatility factor |
| VFOSL | outstandings limit volatility factor |
| VFPM | prudential margin volatility factor |
| $W_{L,R}$ | weighting factor for average regional load |
| $W_{P,R}$ | weighting factor for average regional price |
| $W_{VF,R}$ | weighting factor for volatility factors |