Australian Energy Market Commission

RULE CHANGE

DRAFT RULE DETERMINATION

National Electricity Amendment (New Prudential Standard and Framework in the NEM) Rule 2012

Rule Proponent(s)

Australian Energy Market Operator

Commissioners

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12 April 2012

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For and on behalf of the Australian Energy Market Commission

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Australian Energy Market Commission 2012, New Prudential Standard and Framework in the NEM, Rule Determination, AEMC, 12 April 2012 , Sydney

About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the MCE.

Summary of draft Rule determination

On 27 July 2011, the Australian Energy Market Operator (AEMO, Proponent) submitted a rule change request[1] to the Australian Energy Market Commission (AEMC, Commission) in relation to a new Prudential Standard and Framework in the National Electricity Market (NEM).

The Commission published a consultation paper[2] on 20 October 2011 which explored the background and detail of the rule change request and sought comment from interested parties.

Having considered the responses to the consultation paper, the Commission has determined to make a Draft Rule to implement the proposed rule changes as put forward by the rule proponent, creating a prudential standard in the rules defined as a Probability of Loss Given Default [P(LGD)] of 2%. The rule change also features clarifying amendments including the use of local definitions in line with the Commission's rule drafting approach.

Presently, the National Electricity Rules (NER) stipulate that AEMO must calculate the amount of Credit Support that must be procured by a debtor participant in the NEM with reference to the "reasonable worst case" of monies that could accrue as a result of the lag between energy consumption and energy settlement, or monies that could accrue during the time taken to suspend a retailer following the commencement of default. The reasonable worst case is defined as *"a position that, while not being impossible, is to a probability level that the estimate would not be exceeded more than once in 48 months"*. AEMO consider that this definition is ambiguous. The Rule change request focusses on the establishment of a more transparent, predictable and understandable statistical standard for protection from default in the NEM. AEMO label this the 'prudential standard'.

AEMO propose to define a new prudential standard as 2% P(LGD). This would imply that the prudential arrangements would prevent any shortfall of monies collected by AEMO in 98 out of 100 instances of retailer default. In the remaining 2% of cases, generators would bear a shortfall incurred as a result of the default. Critically, the P(LGD) does not reflect the size of the potential losses that could occur in the 2% of cases. The magnitude of these actual losses would instead be left to generators, their insurers and financiers to estimate and manage as seems best to them.

AEMO also propose a suite of modifications to the processes (and corresponding rule amendments) by which they calculate the retailer obligations, known as the Maximum Credit Limit (MCL) and Prudential Margin (PM). These changes include better reflecting seasonal variability and individual load profiles in calculating the obligations. AEMO also propose to remove provisions for the use of a Reduced MCL (RMCL) from the rules.

1 AEMO, National Electricity Rule Request - New Prudential Standard and Framework.

Eleven responses to the consultation paper were received, from a range of respondents including generators, retailers, and vertically integrated NEM participants.

Respondents were generally supportive of the core motivation and intent of the rule change proposal, though a range of views were expressed regarding some aspects, as laid out in detail later in the document.

The Commission understands that AEMO intends to consult participants on the new procedures it will use to calculate the collateral requirements. Some respondents requested a degree of co-ordination between the AEMC and AEMO in terms of publication of papers and response deadlines, so as to have sight of the entire package of reform rather than sequential segments only. To facilitate this, the AEMC has consulted with AEMO and determined that the deadline for responses to this draft determination is to be set at 22 June 2012. This deadline is intentionally later than the statutory minimum timeframe of six weeks, and is intended to permit reasonable time for respondents to consider AEMO's consultation on the new credit limit procedures, prior to having to finalise their response to this draft determination. AEMO has indicated to the AEMC that it intends to initiate consultation on the new credit limit procedures in May 2012.

2 AEMC, National Electricity Amendment (New Prudential Standard and Framework in the NEM) Rule 2011.

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1 AEMO's rule change request

1.1 The rule change request

On 27 July 2011, the Australian Energy Market Operator (rule proponent) made a request to the Australian Energy Market Commission (Commission) to make a rule regarding a new prudential standard and framework in the NEM[3] (rule change request). The request included a draft rule, and an attachment covering the envisaged accompanying amendments to AEMO's procedures for calculating the level of collateral procured by debtor participants to AEMO. These documents are available on the AEMC's website.

At its core the rule change request seeks to reform the prudential framework in the NEM and introduce at its foundation a statistical standard to be used in calculating the level of Credit Support (comprising the Maximum Credit Limit (MCL) and Prudential Margin (PM)) to be procured by debtor participants to AEMO. This standard would be based on the concept of Probability of Loss Given Default (P(LGD)) and would replace the existing language of the "reasonable worst case" currently defined in the rules. AEMO also propose a suite of modifications to the processes (and corresponding rule amendments) by which they calculate the level of collateral to be procured by debtor participants.

1.2 Rationale for rule change request

AEMO's rule change request follows its completion of a large body of work called the 'Energy Market Prudential Readiness Review' (Readiness Review)[4]. The conclusions of the Readiness Review included a number of potential reforms to the prudential arrangements in the NEM, and has informed the content of the rule change request, in which the rule proponent contends[5] that:

- "the “reasonable worst case” definition is unclear";
- "the current prudential arrangements do not adequately take into account the credit risk that retailers pose to the NEM";
- "Some of the principles in schedule 3.3.1 of the NER for determining the MCL are unclear and some redundant";
- "the current prudential arrangements could be improved by including relevant factors that affect the credit risk retailers pose to the NEM in the methodology used to determine the MCL, while also improving the process for determination of the MCL";

3 AEMO, National Electricity Rule Request - New Prudential Standard and Framework

4 http://www.aemo.com.au/electricityops/prudential_review.html

5 Text in point taken from the rule change request

- "notes that there is an inconsistency between the NER's definition of reaction period and the reaction period used in the credit limits methodology, and considers the NER definition to be in error".

"AEMO considers that the proposed Rule and consequential changes to the methodology would result in overall benefits to the NEM through an improved prudential framework. A clear prudential standard and the proposed framework would make the risk allocation between generators and retailers more transparent and this would increase regulatory certainty in the operation of the NEM's prudential arrangements. In turn, this would promote confidence in the NEM, and the operation of the proposed framework would encourage retailers to manage the credit risk that arises from trading in the NEM more prudently while reducing their long term costs of operating in the NEM."

1.3 Solution proposed in the rule change request

The proponent proposes amendments to the rules as laid out below[6].

The proposed rule:

- deletes references to "reasonable worst case" in the NER, and deletes schedule 3.3 in its entirety;
- replaces "reasonable worst case" with a new definition for the prudential standard defining it as a 2% probability of a Market Participant's MCL being exceeded by its accrued trading amounts (outstandings) at the end of the reaction period;

The proposed rule would delete existing clause 3.3.8 and the principles for determining the MCL and PM in schedule 3.3, and replace with a new clause 3.3.8 that:

- establishes a set of credit limit procedures and a "credit limit procedures objective";
- establishes the MCL as the sum of the Outstandings Limit (OSL)[7] and PM, and defines the three collectively as the 'prudential settings';
- redefines the suite of factors that AEMO should take account of in developing the methodology used to determine the level of the prudential settings for individual participants;

6 Text is taken selectively from the rule change request, is paraphrased in places and is intended to give a high level summary of the changes. The reader is referred to the request itself for the full text.

7 This is a new variable to be defined in the rules, used to calculate the MCL in conjunction with the PM, and is designed to distinguish from the existing Trading Limit, which itself would be retained in the rules.

- requires AEMO to review the effectiveness of the methodology and the prudential settings for each participant at least once per year.

1.4 Commencement of Rule making process

On 20 October 2011, the Commission published a notice under section 95 of the National Electricity Law (NEL) advising of its intention to commence the rule making process and the first round of consultation in respect of the rule change request. A consultation paper prepared by AEMC staff identifying specific issues and questions for consultation was also published with the rule change request. Submissions closed on 6 January 2012.

The Commission received 11 submissions on the rule change request as part of the first round of consultation. They are available on the AEMC website[8]. A summary of the issues raised in submissions and the Commission's response to each issue is contained in Appendix A.

1.5 Relevant Background

Appendix B provides a detailed background of the complete architecture for managing the risk posed by defaulting debtors in the NEM, as well as a review of the work undertaken in exploring reform to the prudential arrangements in the NEM in recent years.

1.6 Extension of time

The publication date of this draft determination was extended under section 107 of the NEL by four weeks. A notice of the extension was published on 15 March 2012.

1.7 Consultation on draft Rule determination

In accordance with the notice published under section 99 of the NEL, the Commission invites submissions on this draft Rule determination, and draft Rule, by 22 June 2012.

In accordance with section 101(1a) of the NEL, any person or body may request that the Commission hold a hearing in relation to the draft Rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than 19 April 2012.

Submissions and requests for a hearing should quote project number ERC0133 and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

8 www.aemc.gov.au

2 Draft Rule Determination

2.1 Commission's draft determination

In accordance with section 99 of the NEL the Commission has made this draft Rule determination in relation to the rule proposed by AEMO.

The Commission has determined it should make, with clarifying amendments, the proposed rule by the rule proponent[9].

The Commission's reasons for making this draft rule determination are set out in section 3.1

A draft of the proposed rule that the Commission proposes to be made (Draft Rule) is attached to and published with this draft rule determination. The Draft Rule is different from the proposed rule by the rule proponent. Its key features are described in section 3.2.

2.2 Commission's considerations

In assessing the Rule change request the Commission considered:

- the Commission's powers under the NEL to make the rule;
- the rule change request;
- the fact that there is no relevant Ministerial Council on Energy (MCE) Statement of Policy Principles;[10]
- submissions received during first round consultation; and
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the National Electricity Objective (NEO).

2.3 Commission's power to make the Rule

The Commission is satisfied that the Draft Rule falls within the subject matter about which the Commission may make Rules. The Draft Rule falls within the matters set out in section 34 of the NEL as it relates to regulating the operation of the National Electricity Market.

9 Under section 99(3) of the NEL the draft of the Rule to be made need not be the same as the draft of the proposed Rule to which the notice under section 95 relates.

10 Under section 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a Rule.

2.4 Rule making test

Under section 88(1) of the NEL the Commission may only make a Rule if it is satisfied that the Rule will, or is likely to, contribute to the achievement of the NEO. This is the decision making framework that the Commission must apply.

The NEO is set out in section 7 of the NEL as follows:

> "The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system."

For the rule change request, the Commission considers that the relevant aspects of the NEO include the promotion of efficient investment in, and efficient operation of, electricity services for the long term interests of consumers of electricity with particular relevance to the efficient pricing of electricity. This is because the prudential framework and the particular standard of prudential surety directly affects the cost of doing business for electricity generators and retailers in the NEM[11].

The Commission is satisfied that the Draft Rule will, or is likely to, contribute to the achievement of the NEO because it facilitates improved economic utility of the prudential framework, improves transparency of the market arrangements and provides greater certainty for participants and AEMO. This will, all else equal, reduce barriers to investment, facilitating competition and thereby lowering the long-term price of electricity for consumers.

Under section 91(8) of the NEL the Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared network functions. The draft rule does not impact AEMO's performance of its declared network functions, and consequently this requirement is not applicable.

11 Under section 88(2), for the purposes of section 88(1) the AEMC may give such weight to any aspect of the NEO as it considers appropriate in all the circumstances, having regard to any relevant MCE Statement of Policy Principles.

3 Commission's reasons

The Commission has analysed the rule change request and assessed the issues/propositions arising out of it. For the reasons set out below, the Commission has determined to make a draft rule.

3.1 Assessment

At its core, this rule change request seeks to enshrine a new, quantitative standard for prudential surety in the NEM, and facilitate the construction of a new and improved calculation methodology for determining the level of collateral procured by debtor participants based on the new standard.

The Commission considers that there is a high degree of quality and depth in the work carried out in recent years on this topic. Further, the Commission acknowledges the depth of insight and participation provided by the array of respondents to the consultation paper.

Respondents to the consultation paper generally agree with the proposition put forward by the rule proponent; that the language of "reasonable worst case" is ambiguous, and that this ambiguity should be removed from the rules. Further, respondents generally concur that the application of the proposed statistic; the Probability of Loss Given Default (P(LGD)), is prudent and would be an improvement to the current prudential arrangements.

Having regard to the quality and depth of research conducted thus far and the submissions received to the consultation paper, the Commission is satisfied that the installment of P(LGD) as an explicit prudential standard in the rules is appropriate.

Several respondents to the consultation paper expressed support for the work compiled by Seed Advisory and Taylor Fry[12]. This work and AEMO's subsequent efforts in the Readiness Review make the case that there exists economic utility in changing the way that the collateral requirements are calculated for individual Market Participants. The Commission recognises that this utility may come at a cost in the form of increased methodological complexity. However, it is satisfied that - quite aside from the form and value of the prudential standard - the proposed procedural reforms (such as seasonal adjustments) would materially improve the economic utility of the framework and by extension, would further the long-term interest of consumers.

The Commission notes the arguments put forward by the Energy Retailers Association of Australia (ERAA) and by TRUenergy, in regard to the actual level of probability that should be used for the prudential standard. While a wealth of material is now publically available in regards to the P(LGD) statistic, its meaning and use; these respondents indicated a view that there is no firm quantitative proof that the value of

12 Seed Advisory and Taylor Fry, The Prudential Standard in the National Electricity Market - Final Report, 4 August 2010 - http://www.aemo.com.au/electricityops/0539-0003.pdf

2% is beyond a reasonable doubt the most optimal value to use. The Commission is satisfied that the candidate value of 2% does appear, with a significant degree of empirical evidence, to be a reasonable number with which to commence the operation of the new prudential framework. With regard to the concerns raised, the Commission notes that the value of 2% could be reviewed via a relevant rule change proposal or reviewed under other relevant provisions of the NEL in future.

3.2 Draft Rule

The Commission has determined to make a Draft Rule to implement the proposed rule changes, with clarifying amendments including the use of local definitions in line with the Commission's rule drafting approach, as put forward by the rule proponent[13].

The draft rule is published alongside this draft determination and is available for download on the AEMC's website.

3.3 Civil Penalties

The Draft Rule does not amend any rules that are currently classified as civil penalty provisions under the National Electricity (South Australia) Law or Regulations. The Commission does not propose to recommend to the MCE that any of the amendments in the Draft Rule be classified as civil penalty provisions.

13 AEMO, New Prudential Standard and Framework Draft Rule - http://www.aemc.gov.au/Media/docs/Rule%20Change%20Request%20Appendix%201%20(Draft%20Rule)-143e297f-f0e7-462f-b5ca-11bfd7567115-0.PDF

4 Commission's assessment approach

Chapter 5 of the consultation paper laid out the Commission's assessment framework in considering this rule change. The Commission stated its intention to consider the degree to which:

- the rule better encourages retailers to take on an efficient level of risk, or at least to take on a level of risk that is not excessive;
- participants agree that the P(LGD) is a good statistic to use in pursuing a Prudential Standard, and to use as a basis for further reform of the Prudential regime more generally;
- the rule minimises the administrative costs of the prudential regime;
- the rule maximises flexibility for retailers and other parties to respond to the prudential regime;
- the rule improves the perceived transparency and predictability of the prudential regime.

4.1 Stakeholder views on assessment approach

In their response to the consultation paper, the ERAA argued that the AEMC should also take into account the impact of the rule change on:

- competition and barriers to entry in the market;
- retailer costs, in particular working capital costs and potentially on retail market offers.

The Commission considers that the first suggested criterion has merit as it relates strongly to the fundamental objectives contained in the NEO. However, impact on competition and barriers to entry are assessable only at the margin with regard to this rule change. The Commission considers that the points already in the assessment framework, if satisfied, will result in improved conditions for participants in the NEM. This would, all else equal, improve conditions for entry and for competition.

The impact on retailer costs is not of itself a suitable assessment criterion in the view of the Commission, because increases in retailer costs could act to promote the NEO, depending on the circumstances surrounding the increase.

The Loy Yang Market Management Company (LYMMCo) argued that the assessment framework outlined by the AEMC should be augmented to include the extent to which the rule change proposal reduces the risk exposure of generators, or at least facilitates exposure to a level of risk that is not excessive.

In similar vein to the previous point, and in concurrence with the conclusions put forward by the Competition Economics Group (CEG) in their paper to AEMO[14], the Commission does not consider that a reduction in the risk faced by generators is a suitable criterion for assessing the merit of the prudential arrangements or this rule change. An increase in the risk taken by generators could act to promote the NEO, depending on the circumstances surrounding the increase.

The Commission does agree that the language of 'not excessive' is appropriate, as the term 'excessive' is interpreted to imply inefficiency; and has been used in previous papers on the topic for this purpose. The Commission considers that its first assessment point - that retailers be incentivised to take on a level of risk that is not excessive - should be taken to generally imply that generators should be exposed to a level of risk that is not excessive. In this sense the Commission concurs with LYMMCo on this point.

4.2 Incentivising retailers' risk taking

In their submission, the National Generators Forum (NGF) suggested that in the context of a gross pool market structure, little can be done to improve risk-takers' ability to manage their risk and that the intention of the rules is to remove the risk from the arrangements. The Commission does recognise that there is challenge in seeking to align the taking of risk by retailers with the consequences of that risk in the context of the NEM design. However the Commission does not agree that the prudential arrangements should seek to remove risk entirely, as this is very unlikely to be economically efficient.

In their submission, Alinta endorsed the findings made by CEG; that a retailer would be acting rationally by not considering the impact of their failure on other participants in the absence of a prudential framework. Alinta considers that the proposal will strengthen the relationship between minimum credit support obligations for retailers and the risk arising from their actions, and provide a signal to retailers to appropriately manage risk.

TRUenergy argued in their submission that there is a link between the quality of the NEM's prudential arrangements and the ongoing level of competition in the market; as failing retailers can cause a reduction in confidence among consumers and a lessened willingness to transfer to a new retailer. As such, incentivising retailers to take on an efficient level of risk is an important consideration. TRUenergy also consider that the ability for risk-taking parties to manage their risk may be improved via reforms that may follow from the proposal rather than from the proposal itself.

The Commission generally agrees with these views and considers that the rule change will act to further the achievement of this objective.

14 CEG, Assessing efficiency in settlement and prudential arrangements for energy markets, A report for AEMO January 2010 - http://www.aemo.com.au/electricityops/0539-0002.pdf

4.3 Perceived merit of P(LGD)

Respondents to the consultation paper included an array of different NEM participants, most of which expressed direct, firm support for the introduction of the P(LGD) statistic for use as a prudential standard.

Having regard to these views and the depth and quality of the work conducted on the application and use of the statistic, the Commission considers that this assessment objective is satisfied by the rule change proposal. This conclusion is detailed in more depth in section 7 below.

4.4 Administrative cost

TRUenergy noted in their submission that the administrative costs of the new regime will depend on the methodology for calculations proposed or envisaged by AEMO. They also argued that significant variations in the level of prudential security may increase administration costs, even if the overall level of security required is lowered under the new regime.

The Commission notes and agrees with these views, and recognises the possibility that frequent, large changes to the level of collateral required could prove more costly for participants in terms of administration than under the present rules.

It is also possible that the methodology for implementing the new credit limit procedures will in fact increase administrative cost for AEMO, although it is anticipated by the Commission that the resources required would be comparable to those expended presently.

In conclusion the Commission considers that this objective, while perhaps not necessarily maximised by the rule change, will not be unduly compromised by implementation of the rule change proposal. The proposal meanwhile however will act to further the other objectives on the list.

4.5 Maximises flexibility for parties to respond

This objective is not directly addressed by the rule change, but the Commission considers that it is not unduly compromised by the proposal. In addition, the Commission notes that the rule change would permit further reform to the arrangements as envisaged in the Readiness Review[15], which could act to further this objective.

4.6 Improves transparency and predictability

Alinta considers that the proposal will improve transparency and clarity, and clarify the probability of generator exposure to short payment.

15 For example, potentially allowing bank guarantees to be substituted by cash deposits

LYMMCo supports the rule change, and any further changes to the NEM Prudential Standards and Framework, to the extent that such changes provide transparent, predictable and understandable arrangements for protection from default in the NEM.

The Commission considers that the rule change will improve the transparency and predictability of the prudential arrangements, mainly via the replacement of 'reasonable worst case' in the rules with the P(LGD)-based prudential standard. This is because the existing language is subject to interpretation and ambiguity, as advocated by the proponent and echoed in the responses to the consultation paper.

5 Platform for reform of prudential framework in the NEM

In its consultation paper, the AEMC asked whether or not the existing architecture of prudential management and 'protection from default' in the NEM constitutes a sound platform from which to begin reform, via the introduction of an explicit prudential standard. This question was designed to allow respondents to comment on their view of the strength of the underlying arrangements, and highlight any systemic flaws not explored by the rule proponent, that might hinder the effectiveness or appropriateness of the rule change.

5.1 Stakeholder views

Aurora and TRUenergy argued that the existing architecture is indeed a sound platform from which to begin reform. TRUenergy noted in particular that it is well understood by participants, has a track record and no serious flaws have been identified in the work carried out so far. TRUenergy also expressed confidence that any future reforms to the arrangements would be broadly compatible with the preceding changes put forward by the proponent.

Origin argued that it is important that a new Prudential Standard and Framework are established prior to the pursuit of the other recommendations in AEMO's Readiness Review.

Ergon Energy suggested that a platform for reform should be based on broader conservative financial market credit risk reforms being carried out under the Basel II accord.

5.2 Commission's determinations

On the basis of responses to the consultation paper and the quality and depth of the research and development behind the rule change request, the Commission is satisfied that the existing architecture for protection from default in the NEM is a sound platform from which to begin reform to the prudential arrangements. Regarding the point made by Ergon Energy, while the Basel accords do feature content relating to prudential security, the Commission does not consider that it is desirable to seek to mimic these accords in making rules relating to the NEM.

6 Ambiguity of the existing prudential standard

The proponent contended in its rule change proposal that the language of "reasonable worst case" is ambiguous and should be replaced in the rules. The consultation paper posed this question to respondents directly.

6.1 Stakeholder views

Ergon Energy, Aurora Energy and the ERAA all explicitly expressed support for the argument that the existing wording is ambiguous, and that it should be replaced using a quantifiable statistical measure that is less open to interpretation.

TRUenergy also supported the concept of moving to an improved standard, arguing that it would provide certainty and a baseline from which to measure future incremental reform.

The NGF considered that the need to replace the language was clear following the work conducted by Seed and by AEMO in their Readiness Review, regardless of the level of ambiguity.

6.2 Commission's determinations

On the basis of responses to the consultation paper and the quality and depth of the research and development behind the rule change request, the Commission is satisfied that the language of "reasonable worst case" is ambiguous and should be replaced in the rules.

7 Probability of Loss Given Default

The consultation paper asked respondents whether the proposed statistic - the Probability of Loss Given Default - would constitute a transparent, understandable statistic that would satisfy the assessment criteria. The paper also asked whether the statistic is sufficiently separable for use as a prudential standard from other variables such as the actual and assumed reaction period.

7.1 Stakeholder views

The ERAA, NGF, TRUenergy, Macquarie Generation and LYMMCo expressed varying degrees of direct support for the application of P(LGD) as a prudential standard in their responses to the consultation paper.

The NGF noted the conclusions of the Readiness Review regarding the impracticality of folding in the probability of and/or size of defaults in establishing a prudential standard for the NEM.

TRUenergy and Alinta Energy, while generally supportive of the adoption of P(LGD) as a statistic, suggested that the AEMC should procure some independent advice from a suitably qualified credit risk expert in assessing its suitability.

Aurora Energy stated a preference that the calculation of the P(LGD) for a given set of input data should be replicable by participant stakeholders, and that care should be taken with regard to the timeframe of historical data used.

The NGF argued that they do not consider that the settlement cycle or reaction period are separable from the prudential standard since they act to influence the level of protection from default enjoyed by creditors.

7.2 Commission's determinations

Regarding the proposition of a procuring further independent advice, the Commission notes this suggestion, but considers that a desktop study would not add much value to the more extensive research conducted by Seed Advisory and Taylor Fry and by AEMO in the Readiness Review. Additionally, the Commission considers that a more extensive study would certainly cause material delay and cost, and may return poor value for money. On balance it was decided that sufficient confidence was expressed by the proponent and respondents, and that sufficient research had been conducted during the Readiness Review to justify the adoption of the statistic in the rules.

Aurora's comments regarding replicability of the calculations are noted, but insofar as they relate to implementation rather than design, the Commission considers that they would be better addressed as part of AEMO's consultation on the methodology it will use to implement the new credit limit procedures.

Regarding the NGF's point about the influence of the length of the settlement cycle and reaction period, the Commission agrees with this assertion. This point is important in the context of any future changes to the rules that would act to change the length of either the settlement cycle (payment period) or the reaction period, leading to consequent change in the level of protection offered by any given P(LGD)-based standard. The Commission does not however consider the interaction between these variables to be detrimental to the adoption of the new prudential standard and framework.

8 Procedural changes

The consultation paper asked whether the proponent's proposed changes to the procedures used to calculate the collateral requirements were appropriate. While the detail of these calculations would be left to AEMO to manage under consultation as outlined earlier, key guiding principles contained in the rule change include the abolishment of the Reduced MCL (RMCL) provision, and introduction of seasonality and load profiling to the calculation of collateral obligations.

8.1 Stakeholder views

Respondents to the consultation paper expressed varying degrees of direct support for the introduction of seasonality and load profiling. These included the NGF, TRUenergy, Macquarie Generation, Progressive Green and EnerNOC. Alinta Energy noted potential concerns for new entrants and individual retailers, but on balance also supported the notion that differentiation between retailers and time of year is important.

Macquarie Generation welcomed the proposal to remove the RMCL, arguing that its use had been shown via the Seed modelling to have led to a worsening of exposure to default since its introduction. Aurora Energy disagreed, arguing that removal of the RMCL would increase the prudential requirements for those currently utilising it.

With regard to the detailed calculation methodology AEMO will use to calculate the prudential settings, Aurora argued that moving to longer periods of reference for the calculation of volatility factors is not appropriate for Tasmania, because of the high volatility seen during Tasmania's entry to the NEM.

Progressive Green proposed that AEMO include in their procedure a factor to apply to retailers that reflects any demonstrable change in the retailer's load in response to high market prices, and requested a separate paper on the topic.

8.2 Commission's determinations

The Commission considers that the Seed modelling conducted for AEMO and subsequently extended for the NGF (see section 10.1 below for more detail) demonstrates the potential to improve the efficiency of the prudential arrangements by increasing the sophistication of the calculation, to emphasise loads and times of year that pose the most risk. This efficiency can be perceived as either a reduction in the total amount of collateral required, or an improvement in the level of protection offered against default, or a combination of both.

It is the Commission's view that these two amendments ('load profiling' and 'seasonality') will clearly further the NEO . This is because they have been shown to improve efficiency - in this case the value for money of each dollar of collateral held - at the cost only of modest increases in the potential complexity of AEMO's calculation methodology.

The abolishment of the RMCL can be seen, in the Commission's view, as a matter of choice in the context of a fixed prudential standard based on the P(LGD) - as explored in the next section. This is in contrast to the theoretical impact of removing the RMCL from the existing rules and making no other changes.

Under the new framework, if a given set of MCLs and PMs[16] yielded a X% P(LGD), and all retailers were then to 'use the RMCL' to immediately reduce the amount of collateral required, the effective P(LGD) delivered by the lower collateral would worsen the level of protection being enjoyed by generators to a number greater than X. AEMO's calculation methodology, once then invoked, would demand increases in the amount of collateral required across the pool of retailers to deliver the fixed prudential standard. So in gross terms - and simplifying for demonstration any importance between the weighting of the Outstandings Limit and the Prudential Margin - it would make no difference if the rules featured an RMCL or not. In the case where some retailers used and others did not use the RMCL, this could lead to unfair economic advantage (depending on the detail of the calculation methodology) for those using the provision; but this is unlikely to represent a steady state as no retailer would be expected to choose to accept an isolated economic disadvantage.

Assessing the abolishment of the RMCL thus reduces to a question of clarity and transparency insofar as these outcomes act to further the NEO. To the extent that the abolishment reduces complexity in the rules by removing a variable, with no cost to economic efficiency, the Commission is satisfied that the abolishment complements the other amendments proposed.

Aurora's point about the historical timeframe for the VF calculation in Tasmania, and Progressive Green's proposed demand-management factor are noted and are included above to facilitate awareness of the issues. The Commission considers that the draft rule contains language (under the credit limit procedures) that would allow AEMO to potentially implement these suggestions. As such, given the nature of these ideas, the Commission considers that they will be better suited for consideration under AEMO's forthcoming consultation on the revised credit limits methodology and do not require a direct assessment or determination in this paper.

16 Noting that under the proposed rule the MCL will be the sum of the PM and the new Outstandings Limit (OSL)

9 Proposed prudential standard

The proponent has proposed the adoption of a 2% P(LGD) as the prudential standard in the NEM. Section 4 of the consultation paper explored this fundamental point, and noted that Seed and AEMO conclude that broadly, the total amount of collateral procured by the NEM retailers need not change by much in order to realise a 2% P(LGD) Standard; "*Based on Seed Advisory and Taylor Fry's analysis, the proposed prudential standard could be achieved without increasing the NEM's average prudential requirements (that is, the overall amount of credit support required from retailers) by changing the methodology used to calculate the MCL and PM*"[17]

9.1 Stakeholder views

Respondents offered a range of different views on the appropriateness of the use of 2% for the value of the prudential standard:

- Macquarie Generation expressed extreme concern that the setting of 2% for the P(LGD) falls well short of the present standard in the rules;
- Macquarie Generation and the NGF advocated that a more appropriate value would be 2% minus one standard deviation, or minus the expected error;
- LYMMCo argued that the new arrangements will still not address the risk of payment shortfall to generators, and that a reduction in the P(LGD) standard below 2% is thus warranted;
- Aurora Energy argued that 2% is not an appropriate value, and that the value should be greater.

TRUenergy expressed concern regarding the lack of significant quantitative analysis supporting the setting of the P(LGD) to 2%. They argued that the analysis presented by AEMO to support the 2% standard is based on returning to the perceived P(LGD) prior to the introduction of the RMCL, thereby returning to the previous status quo; and is not seeking to determine the most efficient level of prudential security for efficient market operation. This sentiment was echoed by the NGF in their response.

TRUenergy proposed a solution to this issue, in similar vein to broader suggestions made by the ERAA; that the AEMC should have responsibility for, and publish the level of the prudential standard. TRUenergy argued that this approach would offer participants more certainty and alleviate concern about the efficiency of the immediate use of 2%, as it would be subject to review by the AEMC following its introduction.

Alinta Energy suggested instead that in the interest of regulatory certainty, the value of 2% should not be revisited; given that the risk is not easily managed or determined in quantity by the actions of generators.

17 AEMO, National Electricity Rule Request - New Prudential Standard and Framework, p11

9.2 Commission's determinations

The Commission is persuaded that there is no completely rigorous proof available that the use of 2% is necessarily optimal. However, the Commission considers that enough empirical evidence exists in the research and in the historical experience of the NEM to suggest that the use of 2% is reasonable. For example, Seed's work demonstrates the effective P(LGD) delivered under more than 13 years of NEM operation to be in the neighbourhood of 2% (closer to 4% following the introduction of RMCL).

While the Commission considers there is merit in TRUenergy's proposal, it considers that it would not be desirable to impose a rules obligation on the AEMC to review the prudential standard. Rather, the Commission considers that the prudential standard should be subject to the same rule making framework that applies to the rest of the rules; that is, subject to either a MCE directed review, or an AEMC review under Part 4 Division 4 or 5 of the NEL, or the procedure for the making of a rule by the AEMC under Part 7 Division 3 of the NEL.

10 Other matters raised in responses

10.1 Shorter settlement cycle

Several respondents offered a strong view that the length of the settlement cycle - or the time between energy consumption and energy settlement - is too long and should be shortened.

Alinta Energy considered that the rule change proposal should be implemented in a way that allows for reduction in the potential size of short payment should additional reform be progressed, with particular note of the potential impacts of a change to the settlement cycle or reaction period in this regard.

Progressive Green argued that the settlement window is unnecessarily long and presents a significant burden, tying up working capital that would otherwise be available to support business growth and efficiency improvements.

The NGF commissioned Seed Advisory to revisit the modelling work carried out for AEMO as part of the Readiness Review, with focus on the potential impact of shortening the settlement cycle on the level of P(LGD) and/or collateral required. The results of this work are available on the AEMC's website along with the NGF's submission[18].

Seed's additional work indicates that there would either be a distinct reduction in the amount of collateral required to be procured by retailers, or an improvement in the P(LGD), or both, under a shorter settlement cycle.

The Commission notes the views put forward and considers the additional research carried out by Seed will be of value to stakeholders of the prudential arrangements in any future reform. The Commission notes that AEMO's Readiness Review concluded that a potential change to the length of the settlement window could be investigated following introduction of a revised prudential standard and framework.

To the extent that the rule change request does not feature amendments to the length of the settlement window (or payment period), the Commission is unable to make any determination relating to that amendment under this request. However the Commission appreciates the efforts put forward as a valuable precursor to any future rule changes that might be proposed relating to this topic.

10.2 Publication co-ordination

In their responses to the consultation paper, the ERAA, Origin Energy and TRUenergy all argued that assessment of the complete suite of reforms, from the prudential

18 http://www.aemc.gov.au/Media/docs/NGF%20-%20Seed%20Report-a5301979-45d3-4c3c-aa32-76c6189908f1-0.PDF

standard through to AEMO's revised calculation methodology is difficult without sight of the yet-to-be-developed calculation methodology.

TRUenergy requested that the timeframe to respond to the draft determination be sufficient to allow AEMO to publish their consultation on the calculation methodology; and that participants be given adequate time to review and consider that consultation paper to ensure the draft rule and proposed procedures are complementary.

The Commission considers there is merit in co-ordinating, to the extent that it is possible to do so, the publication of this draft determination with AEMO's consultation on the proposed calculation methodology. As such, deadlines for responses to this draft determination have been set at 22 June 2012, in the understanding at the time of writing that AEMO's current schedule features initiation of consultation on the new credit limit procedures in May 2012.

10.3 Transition to new framework

Origin Energy argued that once the new rule and procedures are finalised, a transition period is necessary, the length of which to be commensurate with the degree of change between the two regimes.

TRUenergy requested that any transitional provisions for the rule implementation are commensurate with the likely quantum of financial change.

Ergon Energy argue that sufficient time should be allowed for new guarantees to be obtained following the calculation by AEMO of updated obligations.

The Commission considers that those aspects within its control are reasonably well catered for with regard to the transitional provisions as drafted. The commencement date of the rule will likely be at least several months later than the date of the Commission's final determination due to the need to update the market systems, allowing reasonable time for participants to take measures to adjust to the new framework. With regard to sufficient time being allowed for participants to seek new financial instruments if required under the new framework, the Commission envisages that AEMO will have reasonable regard to this request when assigning and applying the revised obligations to individual participants.

Abbreviations

AEMO	Australian Energy Market Operator
APC	Administered Price Cap
CEG	Competition Economics Group
Commission	Australian Energy Market Commission
ERAA	Energy Retailers Association of Australia
LYMMCo	Loy Yang Market Management Company
MCE	Ministerial Council on Energy
MCL	Maximum Credit Limit
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NGF	National Generators Forum
OSL	Outstandings Limit
P(LGD)	Probability of Loss Given Default
PM	Prudential Margin
RMCL	Reduced MCL

A Summary of issues raised in submissions

Stakeholder	Issue	AEMC Response
	General and approach-related comments	
ERAA	Suggest that the AEMC should consider: • the impact on competition and barriers to entry in the market; • the impact on retailer costs, in particular working capital costs and potentially on retail market offers; • the difficulty in Retailers providing constructive comment given that AEMO does not propose to release the methodology until after the AEMC publishes its draft determination.	These considerations are addressed in the main body, in Chapter 4 and Chapter 8 respectively.
NGF	Consider that the proposal to move to a P(LGD)-based methodology with approximately the same level of collateral currently provided by retailers is appealing, as it improves the creditworthiness of the pool whilst using the same level of resources (collateral). However, NGF has concern that the 2% P(LGD) would enshrine a risk of short payment to creditors in the rules, and is concerned over the justification of the proposed 2% benchmark as it appears this has been selected for no other reason than the notion that retailers should procure no more or less collateral than they do today.	This point is addressed throughout the paper and particularly in Chapter 9.
Origin Energy	Consider that the market can benefit from the introduction of a more transparent, predictable and understandable standard, and supports a more specific and tangible definition of the standard.	This is reflected in the main document particularly in Chapter 6.
TRUenergy	Argue that there is a link between the quality of the NEM's prudential arrangements and the ongoing level of competition in the market, as failing retailers can cause a reduction in confidence among consumers and a lessened willingness to transfer to a new retailer. As such, incentivising retailers to take on an efficient level of risk is an important consideration.	The Commission agrees with this assertion and notes the relevance of CEG's work in the Readiness Review in this regard.

Stakeholder	Issue	AEMC Response
TRUenergy	Notes that the administrative costs of the new regime will depend on the methodology for calculations proposed or envisaged by AEMO. Argue that significant variations in the level of prudential security may increase administration costs, even if the overall level of security required is lower.	The Commission notes this point and its implications with regard to the structural questions posed, particularly the material covered in Chapter 5.
TRUenergy	Consider that the ability for risk-taking parties to manage their risk may be improved via reforms that may follow from the proposal rather than from the proposal itself.	The Commission notes this point and considers that the rule change will be likely to promote the NEO via not only its direct improvements to the rules, but via the further reform it may facilitate in future.
Macquarie Generation	Supports comments made by NGF in its submission	
Alinta Energy	Supports the collection of proposed changes, including the removal of the existing reasonable worst case language, removal of the RMCL, and introduction of seasonal and load adjustments to the calculation process.	These comments are discussed in Chapter 8
Alinta Energy	Considers that the proposal will strengthen the relationship between minimum credit support obligations for retailers and the risk arising from their actions, and provide a signal to retailers to appropriately manage risk.	This support is noted in the relevant Chapters of the main body.
Alinta Energy	Considers that the proposal will improve transparency and clarity, and clarify the probability of generator exposure to short payment.	This support is noted in the relevant Chapters of the main body.
Alinta Energy	Considers the proposal will reduce the cost of capital and required credit support in most regions, and better match the credit support obligations with risks over time and by season.	This support is noted in the relevant Chapters of the main body, particularly Chapter 8.
Alinta Energy	Endorses findings by CEG that a retailer would be acting rationally by not considering the	This support is noted in the

Stakeholder	Issue	AEMC Response
	impact of their failure on other participants in the absence of a prudential framework.	relevant Chapters of the main body.
Alinta Energy	Considers the AEMC's modified proposed definition for the reaction period to apply in the calculations appears appropriate.	This support is noted in the relevant Chapters of the main body.
LYMMCo	Supports conclusions reached by CEG, with particular regard to the importance of appropriately allocating prudential risk amongst relevant parties in the NEM.	This support is noted in the relevant Chapters of the main body.
LYMMCo	Supports the proposed AEMO rule change, and any further changes to the NEM Prudential Standards and Framework, to the extent that such changes align with this approach and also provide transparent, predictable and understandable arrangements for protection from default in the NEM	This support is noted in the relevant Chapters of the main body.
LYMMCo	Argue that the assessment framework outlined by the AEMC should be augmented to include the extent to which the rule change proposal reduces the risk exposure of generators, or at least facilitates exposure to a level of risk that is not excessive.	This comment is addressed in detail in Chapter 9. The Commission considers that the objective of incentivising retailers to take on an efficient level of risk encapsulates and implies an intent for generators to be exposed to an efficient level of risk.
	Platform for reform	
NGF	Consider that the Prudential Standard should be agreed upon prior to the implementation of further reforms, if these reforms are clearly separable from the Prudential Standard itself. The NGF do not however consider that the settlement cycle or reaction period are separable from	Chapters 5 and 7 address these comments in detail.

Stakeholder	Issue	AEMC Response
	the Standard since they act to influence the level of protection from default enjoyed by creditors.	
Origin Energy	Considers it important that a new Prudential Standard and Framework are established prior to the pursuit of the other recommendations in AEMO's Readiness Review.	This point is addressed in Chapter 5.
TRUenergy	Notes that work conducted so far has not identified serious flaws in the architecture currently in place, and that future reforms such a shorter settlement cycle would be broadly compatible with the changes put forward by the Proponent. Notes that the existing architecture is well understood and has a track record. Many participants will have invested in ensuring efficient compliance with the existing architecture. Consider that no other reforms should be considered in advance of the AEMO proposal.	This support is noted in Chapter 5.
Ergon Energy	Argue that any platform for reform of the Prudential Framework should be based on broader conservative financial market credit risk reforms being carried out under the Basel II accord.	This point is addressed in Chapter 5.
Aurora Energy	Considers that the existing architecture for protection from default is a sound platform to build meaningful reform to the prudential framework.	This support is noted in Chapter 5.
	Ambiguity of the existing standard	
ERAA	Support the replacement of 'reasonable worst case' with a more transparent and predictable definition	This support is noted in Chapter 6.
NGF	Consider that the terminology of 'reasonable worst case' may be irrelevant given the conclusions of the Readiness Review; such that whether or not it is ambiguous is irrelevant since it cannot be efficiently obtained anyway.	This point is addressed in Chapter 6.
TRUenergy	Considers that the terminology of 'reasonable worst case' can be ambiguous.	This point is addressed in Chapter 6.

Stakeholder	Issue	AEMC Response
	Argues that the timeframe for the pursuit of a Prudential Standard should be longer rather than shorter, and probably comparable to the timeframe used in the USE standard.	
TRUenergy	Support the concept of moving to a transparent, predictable and understandable Prudential Standard, arguing it would provide certainty and a baseline from which to measure future incremental reform.	This support is noted in Chapter 6.
Ergon Energy	Considers that the term 'reasonable worst case' is ambiguous, and supports replacement with a statistical measure which is less open to interpretation.	This support is noted in Chapter 6.
Aurora Energy	Considers that 'reasonable worst case' is ambiguous and should be replaced with a more transparent and quantifiable measure.	This support is noted in Chapter 6.
	Probability of Loss Given Default	
ERAA	Supports use of the P(LGD) statistic in formulating the Prudential Standard	This support is noted in Chapter 7.
NGF	Consider the P(LGD) to be transparent and understandable, and notes the conclusions of the Readiness Review regarding the impracticality of folding in the probability of and/or size of defaults.	This support is noted in Chapter 7.
NGF	Suggest that in the context of a gross pool market structure, little can be done to improve risk-takers' ability to manage their risk and that the intention of the rules is to remove the risk from the arrangements. The NGF do not consider that the settlement cycle or reaction period are separable from the Standard since they act to influence the level of protection from default enjoyed by creditors. As such, the NGF is of the view that this consultation should encapsulate these variables.	These points are addressed in Chapter 7.
TRUenergy	Considers that the P(LGD) is a conceptually transparent and understandable statistic and would allow AEMO to develop an accessible, predictable Credit Limits Methodology. However, also request an independent assessment of its use be carried out by a suitable experienced	This view is noted, but as explained in Chapter 7 the Commission does not consider

Stakeholder	Issue	AEMC Response
	credit risk management professional to ensure that there are no fatal flaws with the approach. Argue that the scope of the assessment should cover the concept of P(LGD) and its suitability for the NEM, as well as the data and processes used to draw conclusions. Argue that this is desirable because the consultation process with participants is not a suitable method for an independent risk review of the model, because participants are not independent.	such a study to be warranted in the context of this rule change.
Alinta Energy	Suggest there may be value in obtaining a peer review of the proposal, such as a desktop review by a credit risk expert independent of the development process, which may provide participants with additional comfort.	As above.
Macquarie Generation	Support the application of P(LGD) as a statistic to use if it reflects present standard in rules.	This support is noted in Chapter 7.
Aurora Energy	Considers that the P(LGD) appears appropriate and is an understandable statistic, but that its interpretation may vary depending on the historical time period over which data is collected. Argue that it is appropriate to use a 12 month historical data period due to the potential for change in the nature of demand under the carbon tax environment from July 2012. State a preference that the calculation of the P(LGD) for a given set of input data should be replicable so that participants can carry out analyses to prepare for changes to their obligations in advance of AEMO notifications.	This support is noted in Chapter 7. Regarding the detailed comments, the Commission anticipates that AEMO's upcoming consultation on its credit limits methodology will facilitate consideration of these.
LYMMCo	Supports deletion of references to the “reasonable worst case” in clause 3.3.8 and its replacement with the new definition for the prudential standard, defined as a 2% Probability of Loss Given Default P(LGD).	This support is noted in Chapter 7.
	Procedural changes	
NGF	Consider that the incorporation of load profiles and seasonal variances is more efficient than what is done presently, and that this would lead to better accomplishment of the NEO.	This support is noted in Chapter 8.
TRUenergy	Consider that the proposed changes to the procedures appear to support the P(LGD) Prudential Standard, though further review will be possible following AEMO's consultation on	This support is noted in Chapter 8.

Stakeholder	Issue	AEMC Response
	the actual detail of these procedures.	
Macquarie Generation	Support the revised procedural methodology proposed to calculate MCL and PM and consider the inclusion of load factor and seasonal adjustments to be a vast improvement.	This support is noted in Chapter 8.
Macquarie Generation	Considers that the work completed by Seed Advisory and Taylor Fry has highlighted a severe under-provisioning of the current prudential scheme, pointing out that the impact of the introduction of RMCL in 2004 has led to 70 days of exposure to default over the 10 year study timeframe, as opposed to the 2.5 day standard implied by reasonable worst case language of 'once in 48 months'. Macquarie subsequently welcome the proposal to remove the RMCL.	The implications of the removal of RMCL is explored in some depth in Chapter 8.
Alinta Energy	Notes potential concerns for new entrants and individual retailers, but on balance supports the notion that differentiation between retailers and time of year is important. Notes point raised by AGL in previous AEMO consultations that retailers making use of bank guarantees are unlikely to benefit from a sculpted approach to credit support. Considers that this may be the case initially, but that guaranteeing institutions will have better clarity about the risk they are carrying and that more suitable and convenient facilities may be made available by those institutions over time.	This support is noted in Chapter 8.
Progressive Green	Argue that significant barriers exist within the current prudential arrangements for retailers who specifically set out to manage load according to market price, such as those exercising Demand Side Participation (DSP). Consider that the proposed Prudential Standard should encourage efficiency including the use of DSP during times of constraint in the NEM. Propose that AEMO include in their procedure a factor to apply to retailers that reflects any demonstrable change in the retailer's load in response to high market prices. Suggest an example methodology using historic comparison between the exposure of the retailer at peak relative to the exposure of all retailers at peak. Recommends a separate discussion paper be issued by AEMO regarding the correlation between energy use and market price as part of development of the procedures.	The Commission anticipates that these comments can be best addressed as part of AEMO's upcoming consultation on its revised credit limits methodology.

Stakeholder	Issue	AEMC Response
	Highlight that DSP-focussed businesses manage price exposure using DSP and as such do not have the access to re-allocation relief enjoyed by a contracted retailer when it comes to meeting prudential obligations.	
Aurora Energy	Does not consider that removal of the RMCL is appropriate, as it would increase the prudential requirements for those currently utilising the RMCL. Considers that moving to longer periods of reference for the calculation of volatility factors is not appropriate for Tasmania, because of the high volatility seen during Tasmania's entry to the NEM. Suggest that the reference period be weighted, with less emphasis placed on older data and more emphasis on recent data. Suggest exclusion of data from the period between Tasmania's entry to the NEM and the beginning of Basslink operation.	The implications of the removal of RMCL is explored in some depth in Chapter 8. The reference period for calculations is a topic that the Commission anticipates can be best addressed as part of AEMO's upcoming consultation on its revised credit limits methodology.
EnerNOC	Strongly agrees with conclusion drawn by Seed Advisory that the risk of loss given default is related to the load factor of the market customer. Consider that generation and DSP are equivalent during peak demand and should therefore be treated equally. Considers that DSP has several advantages over additional generation, and notes different implications with regard to prudential security between the two alternatives.	This support is noted in Chapter 8.
	Proposed value of standard	
ERAA	Argue that the level of P(LGD) should be subject to ongoing periodic review to ensure the setting continues to deliver an efficient level of prudential cover for the NEM. A review to establish the ongoing optimal value of P(LGD) should be independent and subject to public consultation.	This suggestion has been considered in some detail in Chapter 9.
NGF	Argue that combining the rule change proposal with a shorter settlement period will result in greater economic efficiencies than adoption of the rule change proposal in isolation.	These comments are addressed in Chapter 10.

Stakeholder	Issue	AEMC Response
	Consider that the analysis performed on the historical data to obtain a 2% standard would be subject to statistical error as indicated by Seed, and that a standard of 2% minus the expected error, attained in conjunction with a shorter settlement cycle would allow a lower level of collateral to be procured and would present a reasonable compromise between the options available.	
TRUenergy	Express concern regarding the lack of significant quantitative analysis supporting the setting of the P(LGD) to 2%. Argue that the analysis presented by AEMO to support the 2% standard is based on returning to the perceived P(LGD) prior to the introduction of the RMCL, thereby returning to the previous status quo; and is not seeking to determine the most efficient level of prudential security for efficient market operation. Acknowledging that Seed were not tasked with proving the optimal value for the Standard, TRUenergy argue that a model should now be built to capture the costs of increased prudential security from retailers against the cost of increased default risk exposure for generators. The P(LGD) that yielded the lowest summation of costs would then represent the most efficient solution. Suggest that in the interest of timeliness, the proposed value of 2% could be implemented now with an understanding that it be revisited in the future via a potential rule change proposal for example. This is preferred to conducting more analysis now that would cause delay to implementation of the new framework. Also suggest a preferred alternative arrangement whereby a preferred rule be made, giving responsibility to the AEMC to publish the level of the Prudential Standard (similar to the Administered Price Cap). Argue that this approach would offer participants more certainty and alleviate concern about the efficiency of the immediate use of 2%, as it would be subject to review by the AEMC following its introduction.	Chapter 9 considers these proposals.
Macquarie Generation	Express extreme concern that the setting of 2% for the P(LGD) falls well short of the present standard in the rules. Points out that the Seed report recommended the P(LGD) be no more than 2%, and that the standard error was estimated to be about 0.6%. Argue that the error is sufficient to justify setting the standard to at least one standard deviation below 2% in order to provide greater confidence that the collateral procured by retailers would be sufficient in at least 98 out of 100 cases.	This view is addressed in more depth in Chapter 9.

Stakeholder	Issue	AEMC Response
Alinta Energy	Argue that the risk is not easily managed or determined in quantity by the actions of generators. Therefore, Alinta consider that the 2% measure should not be revisited, and that the analysis to date has been robust, and as such support the rule change proposal proceeding.	This view is addressed in more depth in Chapter 9.
Aurora Energy	Does not consider that 2% is an appropriate value for the Prudential Standard, arguing that the value should be greater given that prudential requirements are actively managed.	This view is addressed in more depth in Chapter 9.
LYMMCo	Considers that the introduction of the new arrangements will still not address the risk of payment shortfall to generators. Considers that a reduction in the P(LGD) standard below 2% is thus warranted.	This view is addressed in more depth in Chapter 9.
	Shorter settlement cycle	
NGF	Commissioned Seed Advisory to investigate the relationship between the P(LGD) and a shorter settlement cycle. Seed's analysis argues that an improvement to 0.8% P(LGD) could be achieved by shortening the settlement cycle (to 7 days) while retaining the level of collateral procured currently or under the 2% condition. Alternatively, the collateral required could be reduced by about 40% by shortening the settlement cycle and continuing to hold a 2% standard.	This contribution is covered in depth in Chapter 10.
Macquarie Generation	Argue that the Seed report finds numerous benefits when combining the introduction of P(LGD) with a shorter settlement cycle, including a reduction in the level of collateral required and in the degree of seasonality observed in the P(LGD). Consider that in the absence of a shortened settlement cycle implemented as part of this rule change process, the standard should be set to no more than 1.4% P(LGD).	These comments are addressed in Chapters 9 and 10.
Alinta Energy	Consider that the proposal should be implemented in a way that allows for reduction in the potential size of short payment should additional reform be progressed. In particular, Alinta notes the potential impacts of a change to the settlement cycle or reaction period in this regard.	These comments are addressed in Chapters 9 and 10.

Stakeholder	Issue	AEMC Response
Progressive Green	Argue that the existing settlement window is unnecessarily long and presents a significant financial burden, tying up working capital that would otherwise be available to support business growth and efficiency improvements. Argue that a shorter settlement cycle should be available to retailers who have predominantly large customers with remotely read interval meters which are generally read on a daily basis.	These comments are addressed in Chapter 10.
	Publication co-ordination	
ERAA	Argue that participants cannot fully assess the proposal without the methodology for determining their new prudential obligations, and that this is important as the new methodology removes the existing RMCL provisions and proposes to account for specific retailer load factors. To address this, the ERAA suggest that the AEMC provide participants sufficient time to fully assess AEMO's proposed methodology prior to the close of consultation on the draft determination. This could be implemented by running and extended second round of consultation to ensure sufficient overlap of these inter-related consultations.	The Commission has addressed these comments in Chapter 10.
Origin Energy	Note that the practical implications of the proposal relate to the yet-to-be-developed methodology AEMO will use to calculate the level of collateral retailers will be required to procure, making assessment difficult. As such, recommend that AEMO and the AEMC overlap the respective consultations, such that participants can consider the new methodology prior to the closure of submissions to the AEMC's draft determination.	The Commission has addressed these comments in Chapter 10.
TRUenergy	Request that the timeframe to respond to the draft determination be sufficient to allow AEMO to publish their consultation on the Procedures and time for participants to review and consider those Procedures to ensure the rule and procedures are complementary.	The Commission has addressed these comments in Chapter 10.

Stakeholder	Issue	AEMC Response
	Transitional arrangements	
Origin Energy	Argue that once the new rule and procedures are finalised, a transition period is necessary, the length of which to be commensurate with the degree of change between the two regimes. In particular if participants are required to provide more collateral, adequate time should be allowed for them to secure it.	The Commission has addressed these comments in Chapter 10.
TRUenergy	Request that any transitional provisions for the rule implementation are commensurate with the likely quantum of financial change.	The Commission has addressed these comments in Chapter 10.
Ergon Energy	Argue that sufficient time should be allowed for new guarantees to be obtained following the calculation by AEMO of updated obligations. Note that the current bank guarantee process typically takes three to four weeks. Argues that this is particularly important given the intention to incorporate seasonality and load factors in the calculations.	The Commission has addressed these comments in Chapter 10.

B Background and recent papers

The sections B.1 (Background) and B.2 (Recent papers) below are copied from the AEMC's consultation paper on the rule change request for reference.

B.1 Background

This section describes the architecture present to protect participants in the NEM, and ultimately consumers, from the financial and physical consequences of default. The aim of this Chapter is to provide a reasonably accessible treatment of the entirety of the topic, rather than heavy detail, so that respondents can understand the Rule change request with regard to the broader implications it will have in the wider potential reform of the prudential arrangements in the NEM. Readers already familiar with the detailed work of AEMO in carrying out its Readiness Review and of the Commission in its Review of the role of hedging contracts in the prudential arrangements (outlined in Chapter 4) will already be very familiar with architecture described below.

B.1.1 Terminology

In keeping with conventions used in previous papers on the topic of the prudential arrangements in the NEM, this paper will use the term 'retailer' to generally refer to parties that tend to owe monies to AEMO and/or generators on an ongoing basis, and thereby act to expose those counterparties to the immediate risk of loss in the event of default. 'Generator' will refer to parties that are owed money by AEMO and/or retailers. This is a generality because it is possible under the existing Prudential Framework for generators to owe monies to AEMO and/or have to post monies to cover a Prudential Margin (this can occur when the generator is party to a Settlement Re-allocation). This general terminology is intended for simplicity and is founded in the notion that the NEM has and will continue to feature a material delay between energy consumption and energy settlement[19].

This paper will also make use of convenient variables not defined in the Rules, but used in other recent papers on the topic to explain default risk in NEM.

B.1.2 Architecture of Default Management in the NEM

The Prudential Requirements in the NEM are set out in Rule 3.3 of the NER, and the Default Procedure is set out in clause 3.15.21. For a full treatment of the topic of default management the reader is referred to those parts of the Rules and the various associated procedural papers published by AEMO, such as the Credit Limits Methodology[20]. The AEMC's Review into the role of hedging contracts in the existing

19 In a market where retailers instead pay 'up front', a reversal of risks could apply whereby generators might default and not deliver the energy they've already been paid for.

20 AEMO, Credit Limits Methodology, v8 - http://www.aemo.com.au/electricityops/0530-0022.pdf.

NEM prudential framework[21], hereafter the 'Hedging Review', completed in 2010 also provides an overview of the requirements.

Retailers settle their accounts with AEMO approximately four weeks after the end of the week in which the electricity was supplied. This gives rise to credit risk, because if a retailer fails to pay for the energy consumed, a shortfall will arise between AEMO's incoming payments and outgoing payments to generators.

To address this risk, retailers are required to post Credit Support to AEMO when they are unable to meet the *acceptable credit criteria.* This criteria includes having a rating of A-1 or higher as rated by Standard and Poor's (Australia) or P-1 or higher as rated by Moodys Investor Service, for short term unsecured counterparty obligations. Such a strong rating doesn't usually apply to electricity retailers, and as such in practice, retailers typically need to post Credit Support. In addition to this requirement, retailers are required at all times to maintain a margin (called the Prudential Margin) between the amount they owe to AEMO and the total value of all Credit Support, cash deposits and other instruments (explained below) posted with AEMO.

The Rules require that the Credit Support is to take the form of a guarantee or bank letter of credit. In a circumstance in which the retailer fails to pay AEMO monies owed, the guarantee can be drawn down by AEMO to cover any shortfall arising from the failure to pay.

Default Process

From the moment that a retailer begins to default on its Credit Support obligations, a series of events are triggered:

- The retailer is issued with a Call Notice by AEMO and is given until 11.00 AM the following business day to respond;
- Failure to adequately address the Call Notice results in the issue of a Default Notice by AEMO. The retailer is given until 1.00 PM the following business day to respond;
- Failure to adequately address the Default Notice results in issuance of a Suspension notice. The retailer can be effectively suspended from the NEM within 12 hours of the issue of the Suspension Notice[22];
- Activation of the Retailer of Last Resort (ROLR) arrangements accompanies the suspension. The ROLR takes responsibility for the connection points for which

21 http://www.aemc.gov.au/Market-Reviews/Completed/Review-into-the-Role-of-Hedging-Contracts-in-the-Existing-NEM-Prudential-Framework.html

22 Following discussions with AEMO the AEMC estimates that suspension will typically take up to 12 hours, but the range could theoretically fall between 7 and 16 hours. This is an estimate only, and is not necessarily a precise indicator of the actual time AEMO may take to suspend a retailer following a decision being taken to do so in a specific circumstance.

the defaulting retailer was financially responsible at a time no later than the date of suspension[23];

- AEMO draws upon the Credit Support and any security deposits provided by the defaulting party up to the amount required to pay for Outstandings up to the point of suspension; and finally

- To the extent these quantities are insufficient to cover the monies owed, any shortfall is spread on a pro-rata basis across all participating generation in the NEM.

Should a retailer default for some reason other than failure to meet a Call Notice, the process effectively starts from the issuance of a Default Notice in the process laid out above. Examples of these defaults include failure to pay a settlement amount when due, declaration of inability to pay by the retailer, or withdrawal of authorisation to continue business by a jurisdictional regulator. These arrangements are stipulated mainly in the Rules[24].

Maximum Credit Limit and Prudential Margin

The amount of Credit Support that must be posted by a retailer is calculated by AEMO and is given the label 'Maximum Credit Limit'. A retailer may post more Credit Support than the MCL if they wish, but the MCL is the minimum amount of bank guarantee that must be posted. The MCL is calculated with reference to the "reasonable worst case" of monies that could be expected to be owed over the effective 35-day settlement period and the 'Reaction Period'. The Reaction Period is the assumed amount of time required to physically suspend a retailer, and is set to be seven days, so the MCL is calculated to apply across the 'reasonable worst' 42 days that could be expected. The Prudential Margin is calculated under the same principles[25] but for a window of seven days, and is intended to reflect the reasonable worst case of monies that could accumulate during the Reaction Period. The reasonable worst case is described in the Rules as being "*a position that, while not being impossible, is to a probability level that the estimate would not be exceeded more than once in 48 months*". AEMO has adopted a policy whereby there will be a general review of the MCLs, including the values of the regional parameters used in the determinations, approximately every three months[26]. AEMO also conducts interim reviews in response to major events. A separate MCL and PM is calculated for each retailer.

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23 The draft National Energy Retail Law (NERL), which aims to harmonise ROLR provisions across the regions contemplates this feature (clause 136(5)). The terms of the existing ROLR arrangements are negotiated and managed on a regional basis by the various jurisdictional regulators under guidelines developed by the Australian Energy Regulator (AER).

24 Clause 3.15.21 of the NER encapsulates the complete Default Procedure.

25 There is a specific exception relating to netting effects described later

26 AEMO, Credit Limits Methodology, v8 - http://www.aemo.com.au/electricityops/0530-0022.pdf.

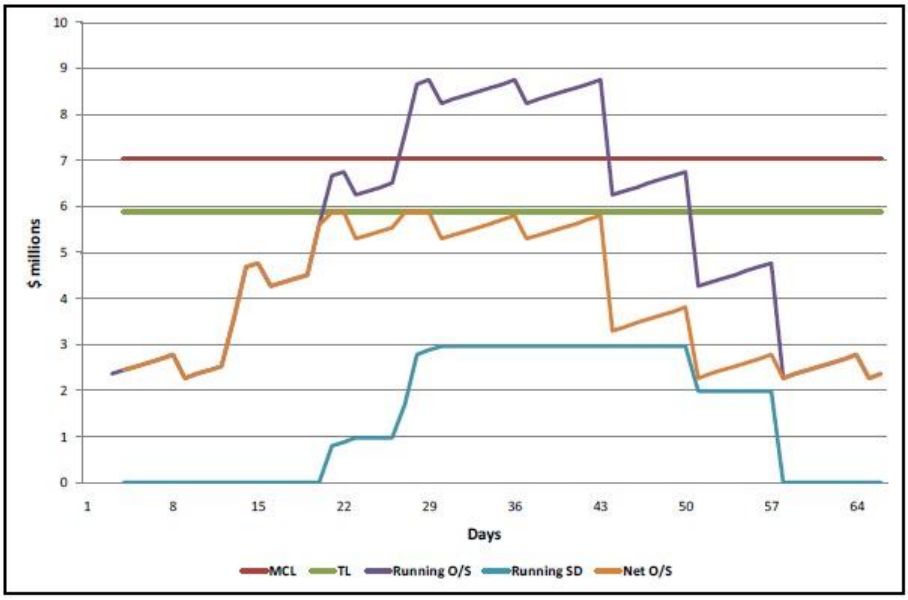
Re-allocations

To alleviate the need to post large amounts of Credit Support and to avoid circular cash flows, retailers may enter into 're-allocation' arrangements with a counterparty and register these arrangements with AEMO. This allows retailers and their contracted counterparties to forego the potential circular flow of cash resulting from a contract structured around the NEM outputs. This also has the effect of transferring the risk of the retailer's default away from the pool and onto its contracted counterparty. Risk allocation within the architecture of default management is discussed further below.

Maintenance of the Prudential Margin

Retailers also may post security deposits (SDA) with AEMO into a security deposit fund in order to continue to maintain the required Prudential Margin between the amount they owe and the amount of Credit Support required. This option does not permit the retailer to avoid the provision of the MCL bank guarantee. The diagram below, taken from AEMO's Readiness Review[27] illustrates the ongoing effect of a hypothetical retailer paying its bills, accruing Outstandings owed to AEMO, and maintaining a Prudential Margin between the amount it owes and the amount of Credit Support required:

Figure B.1 Maintenance of the Prudential Margin



As illustrated during days 25 through 43 in the diagram, the amount of money owing to AEMO can at times exceed the MCL. This has occurred on a number of occasions in the history of the NEM during periods of high spot prices. In these situations, the retailer must provide further guarantees, cash deposits or reallocations to maintain the Prudential Margin between what it owes, and what it could end up owing in the

27 AEMO, Energy Market Prudential Readiness Review, Final Report to MCE - http://www.aemo.com.au/electricityops/0538-0006.pdf, p15

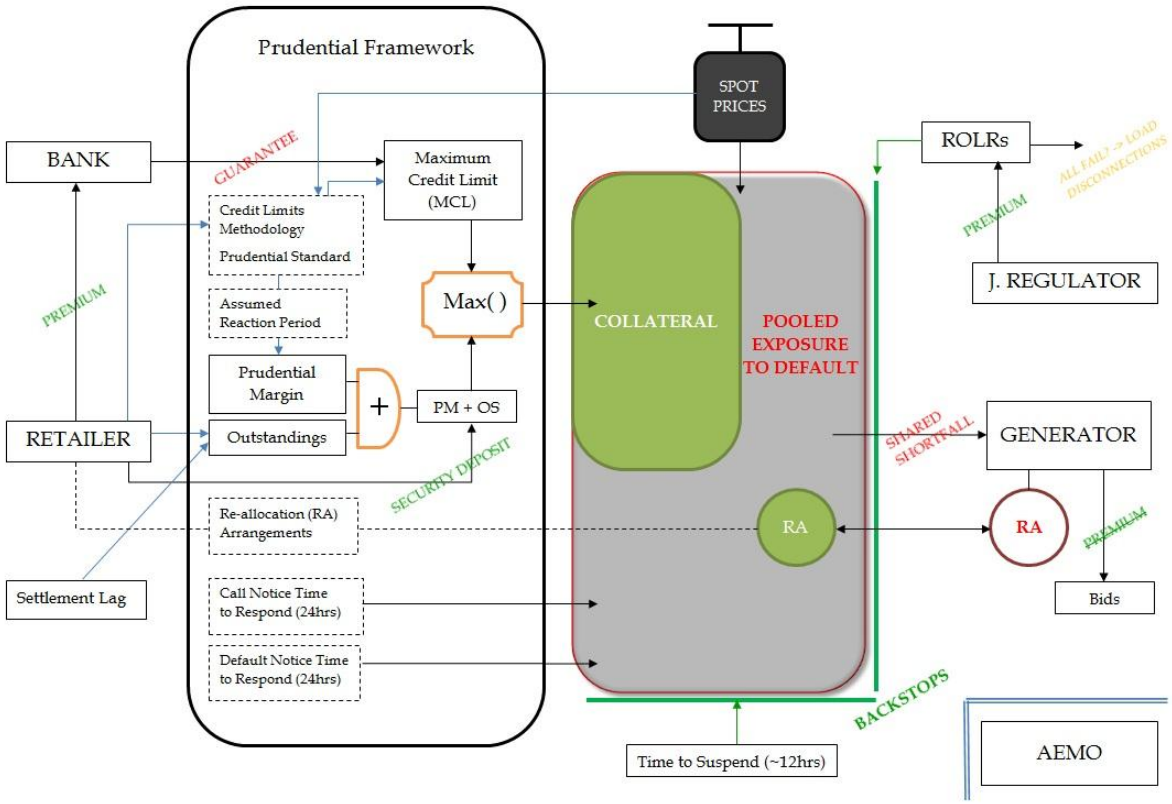
reasonable worst case over the reaction period of seven days. This overwrites the constraint to only provide the MCL (i.e. the retailer must provide more total credit than the MCL).

A converse situation can arise during periods of low price, whereby the amount of money owing to AEMO is significantly below the MCL. In this case the amount of credit headroom posted by the retailer to meet the MCL can be well in excess of the Prudential Margin required to protect the market over the reaction period under the reasonable worst case. The beginning and end periods in the figure above demonstrate this type of situation.

Complete Architecture for Default Management

Most of the features described above fall within what is loosely termed the 'Prudential Framework' of the NEM. This Framework sits inside the implied complete architecture for default management, which includes the process for participant suspension, ROLR provisions, load disconnection and the timing of settlements relative to consumption. The complete architecture of default management in the NEM and the allocation of risk posed to parties by defaulting retailers under the architecture is illustrated in the diagram below:

Figure B.2 Architecture for Default Management in the NEM



The chief objective of the diagram is to illustrate the allocation of risk and risk-mitigating factors with regard to retailer default in the NEM. The diagram was built by AEMC staff and makes several simplifications to the detail contained within the Rules and within the Credit Limits Methodology in the interest of lucidity[28].

In the diagram, spot prices, the four weeks of settlement lag, and the waiting periods between the issuance of notices tend to set the level of the 'Pooled Exposure to Default' of the generators. Mitigating the exposure are the combined effects of Collateral including security deposits[29], reallocations (which are a swap of risk from the pool to an individual generator), and the two 'Backstops' that firmly bound the exposure; comprising the ROLR provisions and AEMO's ability to quickly enact suspension. The key aspect of the architecture is the way in which it allocates risk amongst the parties. In the diagram, risk-taking measures are written in red. The risk-taking measures include:

- The risk taken by generators of shared shortfall flowing from the 'pooled exposure' when a retailer defaults ('Shared Shortfall');
- The risk taken by generators of direct shortfall flowing from a reallocation arrangement with a specific defaulting retailer ('RA'). This risk is matched by an equal and opposite risk mitigant within the pooled exposure;
- The risk taken by banks in providing a letter of credit or guarantee that must then be honoured in the event of retailer default;
- The risk taken by end customers that the ROLR provisions designed to ensure continuity of supply fail to work for some reason, resulting in disconnection of load as ultimately contemplated in the Rules[30].

Risk-mitigating or risk-transferring measures in the diagram are written in green. The measures include:

- The premium paid by retailers to banks in order to obtain the necessary guarantee required to meet the MCL;
- The security deposit paid by retailers to AEMO during periods of high price in order to maintain a Prudential Margin between what is owed and the further

28 For example, the diagram omits the potential need for generators to post Credit Support if registered as a party to reallocation. The Default Notice arrangements are described in the Default Procedure section of the Rules and apply to all types of default, not just those caused by a failure to respond to a Call Notice. Also not shown is the automatic circumvention of the Call Notice process under defaults caused by external factors or by failure to pay at settlement, or the existing option for retailers to post a 'Reduced MCL'.

29 This paper will use the term 'Collateral' to refer to the sum value of all instruments posted to AEMO by the retailer in lieu of the risk it poses by its potential default. The Collateral includes the value of all Credit Support and security deposits.

30 NER Clause 3.15.21(j). This risk is assigned a lighter shade of red in the diagram to indicate its residual nature, as the ROLR provisions are designed to be strong and reliable in the event of a single defaulting retailer.

amount that could be accrued during seven more days of reasonable worst conditions;

- The resultant Collateral that stems from the above two items; which represents the higher of either the MCL, or a combination of guarantees and cash to maintain the Prudential Margin;

- The premium paid by consumers (via varying mechanisms under oversight of the jurisdictional regulators) to the various ROLRs to enter contractual agreements to take responsibility for the retail and supply of their electricity in the event of a retailer suspension, and the subsequent physical and financial assignment of those customers to that ROLR in the event of a suspension;

- The ability of AEMO to quickly physically remove a retailer from the NEM following a decision being taken to do so; and

- The premium included by generators in their dispatch offers to account for the residual risk posed by defaulting retailers allocated to them under the architecture[31].

AEMO have no commercial exposure to the impact of a defaulting retailer. This is represented in the diagram.

For a comprehensive exploration of the topic of risk allocation as it stands under the existing architecture for default protection in the NEM, the reader is referred to the work completed by the Competition Economists Group (CEG) in early 2010 for AEMO[32].

The Prudential Framework

The Prudential Framework is loosely defined in this paper as those components pertinent to the management of default risk that are controllable within AEMO's procedures and/or within Rule 3.3 'Prudential Requirements' of the Rules. .

Standard and Methodology

The key components of the Framework are the standard of Default Protection sought by the Rules and Procedures, and the means by which this standard is translated into obligations on retailers. Currently, there is no explicit 'Prudential Standard' in place as a defined term in the Rules (AEMO's Rule change request suggests the creation of one), but for the purposes of considering the status quo, the standard is effectively the

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31 This premium is 'struck out' in the diagram in order to indicate the policy objective that has been pursued in design, whereby the other mitigants and transfers present in the architecture should act to mitigate the need for generators to reflect the risk posed by defaulting retailers in their dispatch offers.

32 CEG, Assessing efficiency in settlement and prudential arrangements for energy markets, A report for AEMO January 2010 - http://www.aemo.com.au/electricityops/0539-0002.pdf

language used in the Rules to define the 'reasonable worst case', which as quoted above is defined as a position that, while not being impossible, is to a probability level that the estimate would not be exceeded more than once in 48 months.

AEMO currently interpret this language in their Credit Limits Methodology in order to set the obligations placed on retailers. These obligations take the form of the MCL, and the PM. AEMO's current approach to interpreting the 'reasonable worst case' in calculating the MCL and PM is effectively laid out in detail in the latest Credit Limits Methodology[33]. A broad summary is provided here. Assuming away the impact of re-allocations and ignoring for simplicity GST and intra and inter-regional loss factor adjustments, the MCL to be posted by a retailer is given by the product of:

- The forecast volume of energy to be consumed by that retailer's customers over the Credit Period (42 days);
- The forecast average spot price that will apply over the Credit Period; and
- A 'Volatility Factor' (VF) that adjusts these forecast values upward to reflect the reasonable worst case.

The VF is calculated on a regional basis by AEMO by looking at the 'worst' rolling 42-day window of the past 12 months and comparing it to the average 42-day rolling window of the past 12 months. AEMO then total up the amount of money owed (price multiplied by volume) for each of these windows, and then calculates the VF for the region by dividing the maximum observed amount by the average observed amount. This results in a dimensionless scalar parameter greater than 1.0 that inflates the forecast accrual of the retailer over the Credit Period to that of the 'worst case' relatively observed in the past 12 months.

A retailer can opt under the existing Framework to obtain a Reduced MCL which is calculated with a Credit Period of 28 days instead of the usual 42.

AEMO's process for calculating the PM is almost identical to that used for the MCL, except that:

- The Credit Period is replaced with the Reaction Period, defined as seven days in the Rules; and
- Positive net reallocation amounts and trading amounts cannot act to reduce the PM[34].

33 AEMO, Credit Limits Methodology, v8 - http://www.aemo.com.au/electricityops/0530-0022.pdf, p5

34 This in practice essentially means that re-allocations registered by a retailer can't act to reduce the PM, whereas they can in the case of the MCL calculation

Assumed Reaction Period and Notice Triggers / Periods

The amount of time that it takes under the existing Prudential Framework to remove a defaulting retailer from the NEM forms an obvious and key input into the effective exposure of the NEM generators to default. Several components that dictate this time period are set by processes defined in the Rules. Prior to suspending a retailer for failure to post sufficient credit:

- the Rules (clause 3.3.11) require issuance of, and allow until the next business day to respond to, a Call Notice, which is triggered whenever the Prudential Margin is breached[35]; and
- failing an adequate response to the Call Notice, the Rules (clause 3.15.21) then require issuance of, and allow until the next business day to respond to, a Default Notice.

This procedural configuration acts to influence the pooled exposure to default.

The MCL and PM are calculated on an assumption that it will always take seven days to remove the defaulting party (this is defined in the Rules as the 'Reaction Period'). In reality, the true time taken varies depending on the time of week / year the default event occurs. For example, a defaulting retailer issued with a Call Notice on a Monday morning could be removed from the NEM on Wednesday (2 x 24 hour response time + 12 hour suspension time) under the existing procedural configuration.

B.1.3 The Prudential Standard and Exposure to Default

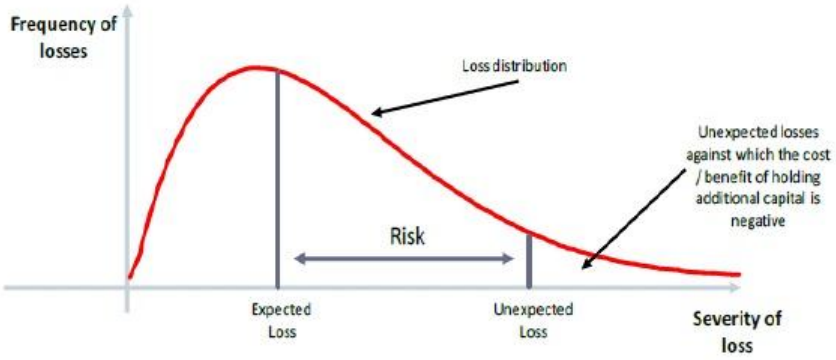
AEMO's Rule change request most fundamentally addresses the desire to clarify the prudential standard of the NEM. This standard was explored in depth by Seed Advisory and Taylor Fry in a report commissioned by AEMO[36] (Seed) and is summarised by AEMO in their Rule change request. Seed characterise the risk posed by default in the NEM with reference to a typical loss distribution under a standard credit risk analytical framework. The loss distribution is a quantitative representation or estimate of the spread of possible outcomes for the risk-taker (i.e. generator). The diagram below is taken from the Seed report (p21) and illustrates the principle of a loss distribution:

35 This is in fact detected under the Rules as a breach of the 'Trading Limit', which is a proxy variable defined by MCL, PM and Outstandings.

36 Seed Advisory and Taylor Fry, The Prudential Standard in the National Electricity Market - Final Report, 4 August 2010 - http://www.aemo.com.au/electricityops/0539-0003.pdf

Figure B.3

Figure 3.1 Standard Credit Risk Analytical Framework, schematic



The diagram illustrates the spread of severity of loss that risk-taking parties can expect when a debtor defaults. The curve indicates that most default events will feature moderate losses. By contrast the risk takers can expect a lower number of very small losses, and a diminishing frequency of higher losses. The distribution is however 'skewed' or 'long tailed', and this gives rise to the threat of very infrequent but potentially catastrophic losses at the far right-hand side. Seed characterise the loss distribution in the NEM as a 'Loss Given Default' (LGD), defined as "*The difference between the total prudential security held, including bank guarantees and cash lodged with AEMO and held in Secure Deposit Accounts (SDAs), and Combined Total Outstandings*"[37]. Seed use the term 'Combined Total Outstandings' (CTO) to describe the amount of debt incurred but not paid by a defaulting retailer, being the sum of all current outstandings incurred, and the prospective outstandings over the Reaction Period. In this way, the difference between the amount of 'prudential security' (labelled 'Collateral' in this paper) and the CTO represents the loss to generators on the condition of retailer default, or 'Loss Given Default'. The Loss Given Default does not measure the probabilistic amount that generators will expect to lose over the long run, only the amount they will lose *when a default event occurs*.

In order to quantify the amount lost over the long run, given a particular distribution of Loss Given Default, the generator would also require an estimate of the probability that these default events will occur in the first place. Seed characterise this quantity as the Probability of Default (PD): "*The likelihood that a Market Participant will fail, which includes failure outside the NEM (including bankruptcy and administration) and defaults in the NEM...*"[38]. In their Rule Change Request, AEMO draw these concepts together, and following from the conclusions put forward by Seed, argue that formulating a probability estimate of the size of a loss is not tractable in the NEM: "*due to the characteristics of the NEM and the statistical distribution of potential losses, unexpected losses cannot be statistically derived, and it is not practical to set a prudential standard for the NEM*

37 , Seed Advisory and Taylor Fry, The Prudential Standard in the National Electricity Market - Final Report, 4 August 2010 - http://www.aemo.com.au/electricityops/0539-0003.pdf, p25

38 Seed Advisory and Taylor Fry, The Prudential Standard in the National Electricity Market - Final Report, 4 August 2010 - http://www.aemo.com.au/electricityops/0539-0003.pdf, p26

related to the size of a potential loss"[39]. This is effectively an argument rejecting the feasibility of quantifying LGD itself under the architecture for protection from default.

This conclusion leads AEMO in their Final Report on the Readiness Review and subsequent Rule Change Request to propose the implementation of a frequency-based Prudential Standard, defined as the probability of Loss Give Default (labelled hereafter P(LGD)): "*This measure represents the probability that the amount of collateral held by AEMO would be insufficient to cover a Participant's total liabilities through the seven day Reaction Period when a participant is suspended from trading...*"[40]. Importantly, this statistic is a measure of the likelihood of there being at least some non-zero shortfall in the event of a default, it is not a measure of the magnitude of that shortfall (LGD), or the likelihood of default actually occurring (PD). It could be concluded that these variables would be instead implicitly left to the risk-takers to manage under the conditions of protection from default that emerge from the pursuit of the frequency-based standard over the long-term.

It is worth observing that like the P(LGD), the existing definition of *reasonable worst case* which would '"not be exceeded more than once in 48 months" also is a form of frequency-based standard, though it is more qualitative in nature, and potentially requires more interpretation in its practical implementation. This is a core motivation for the Rule change request and is discussed in more detail later in the paper.

B.1.4 Key Consequences of Architecture

The architecture of protection from default in the NEM gives rise to some interesting consequences with regard to the pursuit and achievement of a Standard.

Long-term Achievement of a Standard

The fact that the MCL and PM are calculated quarterly, coupled with the Max() effect illustrated in Figure 2.2 means that there will be:

- times when the Collateral posted by the retailer is much larger than necessary; and

- countering times of severe spot prices where the MCL is redundant[41] and Credit Support must be augmented with significant cash deposits. During these periods there can exist a risk of very large losses given default.

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39 AEMO, National Electricity Rule Request - New Prudential Standard and Framework, p10

40 AEMO, Energy Market Prudential Readiness Review, Final Report to MCE - http://www.aemo.com.au/electricityops/0538-0006.pdf, p26

41 in so far as guarantees are interchangeable with cash deposits in terms of value. Recall that the MCL must be matched by Credit Support in the form of guarantees, not cash or any other instrument. The possibility of permitting different forms of collateral to be posted to meet the MCL is contemplated in the conclusions of the Readiness Review.

These periods of varying severity of exposure to default will act to counter each other so that a prudential standard is accomplished over the long-run. This is analogous to the pursuit and achievement of a NEM reliability standard in the form of the target Unserved Energy (USE) currently in place in the NEM. While the USE standard of .002% is accomplished over the long run, there may be specific short periods where the actual or forecast amount of USE is significantly higher than this, with prolonged balancing periods of zero unserved energy.

Trade-off between MCL and PM

It is clear that, when striving to attain a statistical standard such as P(LGD), the architecture would give rise to a trade-off between the level of MCL and the level of PM. For example, a high MCL would, all else equal, require a lower PM in order to attain a certain P(LGD), and vice-versa. In principle either variable could be set to zero, with the other left to rise to satisfy the Standard. The more heavily weighted the MCL, the more the achievement of the Standard will be realised only over the long-run, as the credit posted ceases to reflect the real week-ahead risks posed by a defaulter on a day by day basis. Conversely, higher weighting of the PM would lead to the Standard being realised more consistently over any given segments of time, but only if a more frequent form of rolling calculation of the PM were adopted (e.g. weekly), and this would come at the cost of additional overhead faced by retailers in meeting a regularly changing collateral requirement.

Reaction Period

The real time taken to complete the process of Call Notice, Default Notice, Suspension Notice and suspension itself will usually be different to the 'assumed' Reaction Period hard-coded in the Rules. As per the previous example, a retailer could be suspended following progressive failures to post collateral during a working week in the space of perhaps a few days rather than the seven that are assumed in calculating the MCL and the PM. This could, all else equal, create a mismatch between the standard pursued by a given paired setting of MCL and PM, and the actual standard achieved over the long term.

B.2 Recap of Recent Papers on Prudential Framework

This Chapter provides an overview of recent papers that relate to the topic of the prudential regime in the NEM.

B.2.1 AEMO Readiness Review

AEMO's Rule change request follows its completion of the large body of work called the 'Energy Market Prudential Readiness Review' as described earlier. The Review

commenced following a request from the MCE received on 22 May 2010[42]. The request itself was foreshadowed during 2009 and early 2010, allowing AEMO to begin work in preparation for the Review. This included the formation of the Settlement and Prudential Reference Group (SPRG) and commissioning of the Competition Economics Group (CEG) to provide economic advice. CEG submitted their report to AEMO in January 2010[43].

AEMO commissioned Seed Advisory and Taylor Fry (actuaries) to provide advice regarding a potential Prudential Standard[44] and published two consultation papers along with this advice on 4 August 2010, one each for gas[45] and electricity[46]. A draft report was published on 12 October 2011[47] and subsequently submitted to the MCE. The final report was made public on 27 April 2011[48].

B.2.2 AEMC Hedging Review

During 2009 and early 2010 the AEMC carried out a Review of the role of hedging contracts in the existing NEM Prudential Framework[49] (Hedging Review). This Review was initiated following the conclusion of a Rule change request relating to the application of Futures Offset Arrangements and modification of the MCL calculation methodology, and was conducted in parallel with AEMO's work. The Review featured procurement of risk assessment advice from PricewaterhouseCoopers (PwC). As AEMO's Readiness Review and subsequent Rule change request makes reference to the work completed by the AEMC in mid 2010, the Hedging Review itself is not recounted in depth here but some of its key recommendations are referred to.

The following sections draw out some highlights directly relevant to the Rule change request from the work completed during the two Reviews, but do not constitute an exhaustive summary of all the work completed.

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42 Ministerial Council on Energy – Business Readiness Assessment & Terms of Reference (http://www.aemo.com.au/electricityops/0539-0001.pdf)

43 CEG, Assessing efficiency in settlement and prudential arrangements for energy markets, A report for AEMO January 2010 - http://www.aemo.com.au/electricityops/0539-0002.pdf

44 Seed Advisory and Taylor Fry, The Prudential Standard in the National Electricity Market - Final Report, 4 August 2010 - http://www.aemo.com.au/electricityops/0539-0003.pdf

45 AEMO, Gas Prudential and Settlement Framework (http://www.aemo.com.au/electricityops/0538-0002.pdf)

46 AEMO, NEM Prudential and Settlement Framework (http://www.aemo.com.au/electricityops/0538-0001.pdf)

47 AEMO, Energy Market Prudential Readiness Review - Draft Report (http://www.aemo.com.au/electricityops/0538-0003.pdf)

48 AEMO, Energy Market Prudential Readiness Review - Final Report to the MCE (http://www.aemo.com.au/electricityops/0538-0006.pdf)

49 http://www.aemc.gov.au/Market-Reviews/Completed/Review-into-the-Role-of-Hedging-Contracts-in-the-Existing-NEM-Prudential-Framework.html

B.2.3 CEG Advice

In their report[50], CEG draw several insightful conclusions regarding the pursuit of economic efficiency in the NEM settlement and prudential arrangements. These conclusions are particularly relevant in terms of the AEMC's role in processing any Rule change request arising from the Readiness Review, given its requirement to consider economic efficiency as laid out in the National Electricity Objective (NEO) described in Chapter 5. Some particularly useful excerpts from CEG's report are repeated here:

> "3. It is ... relevant to ask what the efficiency rationale is for the prudential system. In contrast to what may be intuitive, we conclude that the efficiency rationale for the prudential system is not to make sure generators have a high degree of certainty that they will be paid by retailers. Rather, we conclude that this is a side effect of an attempt to achieve the primary efficiency rationale – which is to give retailers the appropriate incentive to manage risks and, importantly, to ensure that retailers do not have an artificial incentive to take on too much risk."
>
> "7. ... .Under the current prudential regime a retailer taking on a particularly high risk hedging strategy is likely to have to pay more for a bank to guarantee its pool liabilities. A retailer will have less ability to shift risks onto third parties and, therefore, will be less likely to incur an inefficient level of those risks in the first place."
>
> "11. Any assessment of potential improvements in economic efficiency must examine:
>
> (a) Whether it improves (worsens) the incentives for retailers to take on too much risk? If it does, what are the likely net present value of benefits (costs) associated with retailers' response (difficult to measure).
>
> (b) The impact on the costs of administering the regime (largely the costs of evaluating and monitoring retailers' risks)."
>
> "12. If two regimes give retailers the same incentives to manage their risk profile, then the one that gives rise to the lowest administration costs will be the most efficient. Given that the costs of a prudential regime primarily relate to the costs incurred in evaluating and monitoring risk, the best prudential regime will generally be one that allocates the role of evaluating and monitoring risk to a party with the lowest costs/strongest incentive to do so."
>
> "13. It will also be generally true that, once a prudential standard is set, economic efficiency will be promoted if retailers have flexibility in the

50 CEG, Assessing efficiency in settlement and prudential arrangements for energy markets, A report for AEMO January 2010 - http://www.aemo.com.au/electricityops/0539-0002.pdf

methods that they can use to meet the required prudential standards so they can select the method that lowers their costs (provided that this does not compromise meeting the selected prudential standard)."

CEG allude to the motivation for a prudential regime again in other parts of the paper:

"40. ... Absent any prudential requirements then retailers would have an incentive to have low levels of capital (or insurance) such that in the event that the retailer became insolvent the losses would be borne, at least in part, by their major creditors (the generators).

41. Retailers would also have an incentive to take on riskier strategies because instead of bearing all of any increase in risk they would be able to pass at least some of the increased risk onto the generators."

This point is well expressed by an example[51], and argues that, absent some form of administered prudential regime, a spot pool market may not incentivise a retailer to take on an efficient level of risk (when compared to, say a bilateral contracts market). This means that some (but not necessarily all) economically efficient actions that would reduce risk may be lost, while some economically inefficient actions that increase risk may be adopted, because the benefit / cost of these actions would be spread over the whole pool rather than being enjoyed / borne completely by the retailer. A conclusion from this point could be that the prudential regime in the NEM should compel retailers to behave in a way that would reflect their decisions in an environment where this incentive bias was not present.

"106. An efficient settlement and prudential regime is one that minimises the sum of administration costs and the price paid for bearing risk. The selection of the most economically efficient settlement/prudential arrangements boils down to finding the set of arrangements that minimises the sum of:

(a) The administration costs incurred or paid for by NEM participants ; plus

(b) The cost of bearing risk – whether that risk is borne by a NEM participant directly or paid to a third party by a NEM participant."

"160. ... Economic efficiency will be promoted with all parties face price signals that accurately convey to them the costs of all of their actions. In the case of retailers, this means that they should be required to bear the risks that their business strategy exposes them to. Ideally, retailers should have the flexibility of doing this in a range of ways so that they can select the least cost method for them."

51 CEG, Assessing efficiency in settlement and prudential arrangements for energy markets, A report for AEMO January 2010 - http://www.aemo.com.au/electricityops/0539-0002.pdf, page 11

AEMO refer explicitly to the last reference in their Rule change request, and the SPRG have adopted key elements of CEG's advice in the formulation of a Decision Making Framework, as laid out on their website[52].

B.2.4 Seed Advice

In mid 2010 Seed Advisory and Taylor Fry completed a detailed quantitative analysis of the application of a Prudential Standard focussing particularly on the use of P(LGD), and associated changes to the Credit Limits Methodology. The content of AEMO's Readiness Review and Rule change request draws heavily on this work. Some of Seed's key conclusions include:

> "As a result of our review of the performance of the current prudential arrangements, we recommend that the Prudential Standard is amended to expressly adopt a probability that a loss given default would occur on no more than 2 percent of days where a Market Participant is unable to provide the cash or other securities required to keep its Total Outstandings within its Trading Limit. This measure has the advantage of mapping onto Australian Energy Market Operator's (AEMO) daily process for assessing participant risk and is readily measured and monitored."
>
> "A target for the probability of a loss given default of 2 percent or less represents an achievable improvement in the performance of the current prudential arrangements. Measured as an average of the National Electricity Market (NEM) regions' performance, the current prudential arrangements result in a probability of a loss given default of around 4 percent measured over the 10 years to the beginning of 2010."
>
> "The probability of the risk of a loss given default can be furthered (sic) reduced to a target of 1.5 percent or less. The cost of this improvement would be an increase in the level of the Prudential Requirements, compared with maintaining the target performance for the probability of a loss given default at 2 percent."
>
> "Historically, Market Participants have been exposed to a small number of very large potential loss given default events."

B.2.5 Envisaged Reforms to Prudential Framework

AEMO conducted two rounds of consultation as part of the Readiness Review. Combining the responses to the consultations and the advice provided by CEG and Seed with their own analysis, AEMO identified the following potential reforms to the prudential arrangements in the NEM, of which the first (item (a)) constitutes the subject of the Rule change request:

52 http://www.aemo.com.au/electricityops/prudential_review.html

"In conjunction with the reference group, AEMO identified the following issues with current arrangements:

(a) The NEM Prudential Standard is not clearly articulated, and would need to be clarified as a firm reference point for future enhancements of the regime.

(b) Current arrangements are capital intensive. This can have an impact on investment and competition across the various energy markets.

(c) Options for satisfying the specified collateral obligations are limited. This is particularly an issue on electricity, where collateral obligations are large.

(d) The NEM makes provision for Generators to be short-paid in the event that insufficient collateral is available to cover a default. Those short-payments are currently required to be managed by individual generation businesses, but there could be merit in providing more centralised support for their management.

...

1. Implementation of a new prudential standard and Credit Limit Methodology for the NEM:

AEMO proposes to submit a Rule change to the AEMC to adopt a NEM prudential standard of 2% probability of "loss-given-default"...

In parallel with promotion of the revised prudential standard, AEMO will modify its procedures to replace the current obligation for new entrants to lodge $100,000 collateral with a mechanism that better matches obligations to the risk presented to the market.

2. Increasing the options available to participants in meeting their prudential obligations:

...

a) Alternative forms of collateral in the NEM: AEMO will seek to establish a mechanism for the lodgement of cash as an alternative to bank guarantees. A key consideration is to ensure that any proposal adequately manages the risk of clawback through changes to the Rules... .

b) Integration of the NEM with contract markets: Integration is enhanced by the use of "reallocation" mechanisms. A new Swap and Option reallocation mechanism has been developed, and will be launched subject to AEMO being granted an exemption by ASIC from holding a clearing and settlement facility licence... .

c) Single Guarantee for Related Entities: Participant organisations with multiple related entities would benefit from an ability to net their prudential obligations across those entities, and cover the residual prudential obligation with a single guarantee. AEMO proposes to collaborate with interested parties to develop a workable arrangement to achieve this, most likely through the use of cross-guarantees between the related entities. The arrangement will be limited to use within a single market such as the NEM, or one of the gas markets.

d) Management of payment shortfalls to NEM Generators: In the unlikely event that the collateral held by AEMO is insufficient to cover the outstanding trading amounts of a suspended Retailer; the Rules make provision for Generators to be short paid. The actuarial analysis shows that, in the extreme, these short payments could be substantial. Subject to continued interest from Generators, AEMO will investigate with Generators, whether operational measures can be taken to mitigate the impact of such events and so reduce the risk of a systemic failure being triggered.

e) Futures Offset Arrangements: ... the AEMC recommended that AEMO model the merits of the AEMC's proposed Futures Offset Arrangement, following consolidation of AEMO's findings on the prudential standard ... AEMO proposes to carry out that analysis when the prudential standard and associated arrangements are well progressed through the Rule change process, noting that they will not become stable until that time.

3. Investigation of alternative arrangements for NEM prudentials and settlements:

In addition to exploring improvements to the current NEM prudential framework, AEMO intends to consider whether alternative arrangements could be developed. The identification of alternative arrangements is still in its infancy, and there is no guarantee of identifying material improvements to the status quo, but options for consideration might include elements such as increased pooling of credit risk, potentially in combination with an insurance mechanism.

4. Further examine a package of measures designed to deliver a shortened NEM settlement cycle:

Shortening the NEM settlement cycle from four weeks in arrears to approximately one week in arrears was considered in some detail in the review. The analysis indicated that prudential risks are likely to be reduced materially through such a change, however the early payment would give rise to a transfer of wealth from Retailers to Generators. The cost of this wealth transfer would, at least initially, outweigh the benefits of lower prudential obligations for some Retailers. There is contention over whether this transfer would be sustained or temporary, as the savings seen by

Generators are passed back through competition. Generators and some small Retailers support a shorter NEM settlement cycle, while other Retailers oppose it (AEMO Energy Market Prudential Readiness Review, April 2011, Page 8 of 100). AEMO intends to further consider this matter once the above work program is in hand. Two other matters that will be considered in conjunction are:

- Changing the nominal NEM settlement day from a Friday to a Wednesday to help minimise the occurrence of difficulties due to administrative failure; and

- Providing the option for participants to undertake that they will respond to any "call notices" they receive from AEMO by the next day rather than the next business day, which could provide the basis for reducing the amount of collateral that they need to lodge."

AEMO identify that the establishment of a clear Prudential Standard is optimal prior to the implementation of any further reform "*AEMO considers that establishing a clear prudential standard and framework is paramount and should be pursued before further efficiency gains are sought. This would ensure future changes are based on a solid and well understood foundation*"[53]. Consequently, it is the establishment of this Standard that forms the topic of the Rule change request.

53 AEMO, National Electricity Rule Request - New Prudential Standard and Framework, pages 1 and 2