

NATIONAL ELECTRICITY LAW

REQUEST FOR MAKING OF A RULE AMENDMENT RELATING TO THE DETERMINATION OF SPOT PRICES

A. NAME AND ADDRESS OF PERSON MAKING THE REQUEST

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B. BACKGROUND

The AER proposes that the text of the NER be amended to alter the obligation imposed on NEMMCO under clause 3.9.2 of the National Electricity Rules (NER) to set the dispatch price within 3 dispatch intervals to the value of lost load (VoLL) following the shedding of interruptible load as a result of a contingency event¹ (automatic load shedding).

The proposal follows a detailed investigation by the AER of the events of 16 January when bushfires caused transmission lines between Victoria and New South Wales to fail. Around 25 per cent of Victoria's load was shed and the national power system was separated into three electrical islands following the transmission line failure. The AER found that most aspects of the power system worked well on the day despite the extensive shocks. The power system remained stable even though 2200MW of load was shed. Load was fully restored within four hours. However, the AER identified scope for improvement and has taken a number of steps to ensure that improvements are made:

- The AER is recommending two rule changes, this rule change and another rule change to improve re-classification processes and outcomes.
- Some generators failed to ride through the power system disturbance as agreed to in their performance standards. However, in Victoria and Queensland, ongoing Chapter 9 derogations apply less exacting technical standards, potentially compromising system security. The AER has written to Ministers in Victoria and Queensland recommending removal of the derogations.
- The AER took enforcement action against the SECV for bidding in ancillary services that it could not provide. The SECV was issued dispatch instructions and paid for those services.
- The AER recommended that NEMMCO review its load restoration and intervention pricing practices. NEMMCO will report to the market on the outcomes of the reviews by the end of 2007.

The AER's investigation found that requiring NEMMCO to assess whether prices should be set to VoLL in circumstances such as those that existed on 16 January could compromise system security. The assessment is complex and must be undertaken by operational staff. The assessment process distracts the operational staff from their task of managing system

¹ A contingency event is defined in clause 4.2.3(a) of the Rules as an event affecting the power system which NEMMCO expects would be likely to involve the failure or removal from operational service of a generating unit or transmission element.

security. In practice, the complexity of the process and the limited time-frames to properly consider the issues resulted in errors in setting the dispatch price to VoLL on 16 January. NEMMCO made similar errors on 8 March 2004 and on 14 March 2005. The errors compromise the NEM objective by distorting dispatch and demand-side responses.

The AER's proposed rule change would allow NEMMCO to focus solely on returning the power system to a secure operating state in such cases. Furthermore, the proposed change would remove the risk of distorting generation dispatch and demand-side response by incorrectly setting prices to VoLL, thereby resulting in more efficient market outcomes.

The AER's proposal should be read in conjunction with its investigation report. A copy of the report can be found on the AER's website: www.aer.gov.au.

In developing the rule change proposal, the AER did not formally consult. The AER did, however, discuss the nature and practical implications of the proposal with both NEMMCO and the National Generators Forum (NGF). NEMMCO indicated its support for the Rule change proposal. The AER considers that the Rule change proposal addresses the issues raised by the National Generators Forum. Those issues and the way the proposal is considered to address them is set out later in this proposal.

C. STATEMENT OF ISSUES

i Summary of current provisions

Clause 3.9.2(e) sets out the circumstances in which the dispatch price may be set to VoLL by NEMMCO. In essence, clause 3.9.2(e) of the NER requires NEMMCO to set the dispatch price equal to VoLL in two sets of circumstances:

- all load in a region could not be supplied and NEMMCO issues instructions to shed load – manual load shedding (clause 3.9.2(e)(1)(i)); or
- load has been shed automatically as a result of a contingency event and no more load can be restored – automatic load shedding (clause 3.9.2(e)(1)(ii)).

In the case of automatic load shedding under clause 3.9.2(e)(1)(ii), in addition to the requirement that no more load can be restored before VoLL can be imposed, clause 3.9.2(f) also requires that, following automatic load shedding, the power system must be allowed to return to a secure state (with, amongst other things, the frequency within the normal band) for three dispatch intervals before the dispatch price can be set to VoLL by NEMMCO.

Clauses 3.9.2(e)(1)(i) and (ii) and 3.9.2(f) were inserted into the NER following a report on the market's performance in extreme conditions in 2001.² The report made it clear that the dispatch price should only be set to VoLL when there are insufficient supply options to satisfy all of the demand in the energy market. The interruption of customer load may provide an indication that supply is insufficient to meet demand.

The 2001 report identified two distinct sets of circumstances in which customer load might be interrupted. The *first* relates to cases where there is insufficient supply in the energy market. Such a scenario is most likely to occur at times of extremely high demand, but can also occur

² NECA Investigation into the Market's Performance in Extreme Conditions, Final Report, July 2000 - National Electricity Code Changes gazetted 11 October 2001.

at other times following widespread plant unavailability (covered by clause 3.9.2(e)(1)(i)). The *second* relates to situations where load shedding occurs as a result of action to ensure the power system remains secure following a non-credible contingency event (covered by clause 3.9.2(e)(1)(ii)).

It was considered necessary to draw a distinction between the two sets of circumstances referred to above because, in the case of the latter, load will often not be shed in response to a supply/demand imbalance. Rather, in the second set of circumstances (i.e. cases where load is automatically shed following a non-credible contingency event), load may be interrupted solely to control power system frequency and, in such cases, the interrupted load performs the role of mandatory ancillary services in accordance with clause 4.3.5 of the NER. Load may be shed in these circumstances despite the existence of significant generation reserves. The 2001 report clearly stated that, in these cases, it is inappropriate to set the dispatch price to VOLL.

ii The issue with the current provisions

As noted, clauses 3.9.2(e)(1)(ii) and 3.9.2(f) provide for the setting of VoLL in cases where load shedding occurs as a result of action to ensure the power system remains secure following a non-credible contingency event. As currently drafted, these provisions have proven difficult to apply in practice. Specifically, it appears to have proven difficult for NEMMCO to determine:

- that no more load can be restored following a contingency event; and
- whether the power system has been restored to a secure operating state.

The AER considers that the events of 16 January 2007 illustrate the practical difficulties faced by NEMMCO in applying those clauses.

On 16 January, bushfires caused two 330kV transmission lines linking Victoria to New South Wales to trip, causing other transmission lines between Victoria and New South Wales and between South Australia and Victoria to trip. The result was a major imbalance between supply and demand, which caused the power system frequency to fall and led to the activation of the Victorian automatic under-frequency load shedding scheme.

Load restoration commenced about 45 minutes later. Approximately one hour after automatic load shedding occurred, at 4.05pm, NEMMCO announced that the power system had been restored to a secure operating state. Following the expiration of three dispatch intervals – that is, at 4.20pm, NEMMCO set the dispatch price to VoLL. This was purportedly in accordance with clause 3.9.3(e)(1)(ii) and clause 3.9.2(f). In fact, however, the conditions for setting the dispatch price to VoLL had not been fulfilled at the time NEMMCO set the dispatch price to VoLL. Specifically:

- At 4.20pm, when the dispatch price was set to VoLL, NEMMCO could restore more interruptible load. In fact, NEMMCO continued restoring interruptible load for a substantial period after setting the dispatch price to VoLL

- From 4.47pm. until around 4.54pm the frequency in the power system was not within the normal band.³ During this period, NEMMCO instructed SP AusNet to manually shed load in order to restore frequency.⁴

The early imposition of VoLL meant that many generators in Victoria were not fully dispatched at the time the dispatch price was set to VoLL. This led to the following:

- Flows from Victoria to South Australia across the Heywood interconnector resulted in energy being supplied from a high-price region to a low-price region or counter-price.
- For the majority of the period that the VoLL override applied, FCAS prices were considerably lower than the energy price . This meant that some generators were not compensated appropriately for providing FCAS instead of energy.
- Generators were only generating at part load at the time VoLL was imposed. In order to maximise dispatch given the high price payable, generators could have been incentivised to deviate from dispatch instructions, which could have put system security at risk.

The AER notes that this was not the first occasion on which NEMMCO has set the dispatch price to VoLL in a manner inconsistent with clauses 3.9.2(e)(1)(ii) and 3.9.2(f). For example, investigations into the events of 14 March 2005 and 8 March 2004 identified instances where the spot price was set to VoLL when the conditions contained in clauses 3.9.2(e)(1)(ii) and 3.9.2(f) had not been fulfilled.⁵ The response in previous cases was to recommend that NEMMCO alter its internal procedures to ensure compliance with the relevant provisions of the NER. However, as illustrated by the events of 16 January 2007, the various alterations to NEMMCO's procedures do not appear to have been successful.

In any event, the AER considers that clauses 3.9.2(e)(1)(ii) and 3.9.2(f) inappropriately require NEMMCO to perform two difficult tasks simultaneously in the context of extreme market conditions. Ascertaining whether a supply/demand imbalance exists or whether more interruptible load can be restored for the purposes of clauses 3.9.2(e)(1)(ii) and 3.9.2(f) involves a complex and, potentially, subjective decision-making process. Furthermore, NEMMCO is required to establish prices for each dispatch interval while concurrently assessing on an inter-temporal basis whether the requirements of clause 3.9.2(e)(1)(ii) and clause 3.9.2(f) have been satisfied. Given the circumstances in which these decisions must be made, it is unsurprising that NEMMCO has had difficulties in complying with clauses 3.9.2(e)(1)(ii) and 3.9.2(f).

A further problem with clauses 3.9.2(e)(1)(ii) and 3.9.2(f) is that inappropriately setting the dispatch price to VoLL can have a significant impact on market participants. On 16 January 2007, there were random winners and losers among participants, depending upon whether or

³ NEMMCO Power System Incident Report: System Separation and Load Shedding 16 January 2007, p. 70, fig. 6.5.

⁴ The fact that frequency was not within the normal band at these times was implicitly accepted by NEMMCO in its replies to the AER's questions. In particular, NEMMCO agreed that, in hindsight, instead of instructing SP AusNet to shed 100MW at 4.47pm and 4.54 pm to assist with frequency control, other alternatives could have been utilised, including directing ancillary services providers in South Australia. NEMMCO qualified its response by stating that, based upon the information readily available to NEMMCO at the time, its actions were reasonable and prudent.

⁵ Report into power system incident on 14 March 2005 in South Australia, National Electricity Code Administrator, p. 10. See also Investigation into the Market's Performance in Extreme Conditions, Final Report, July 2000.

not they were being dispatched at the time the dispatch price was set to VoLL, their contractual position, and whether or not they were dispatched for FCAS. In addition, there was a period of significant counter-price flows and negative inter-regional settlement residues.

iii How removal of the requirement to set dispatch prices to VoLL after automatic load shedding will address the current issues

The AER considers that removal of clauses 3.9.2(e)(1)(ii) and 3.9.2(f), which require NEMMCO to set the dispatch price to VoLL following automatic load shedding, is the best way to deal with the issues outlined above. The rule change proposal would not alter the requirement, currently contained in clause 3.9.2(e)(1)(i), which requires NEMMCO to set the price to VoLL following manual load shedding, as a result of generation scarcity. In any case, to date, manual load shedding has proved very rare.

Concerning the practical difficulties associated with the application of clauses 3.9.2(e)(1)(ii) and 3.9.2(f), the removal of these provisions from the NER would mean that NEMMCO would be focused on returning the power system to a secure operating state as quickly as possible rather than on assessing fulfilment of conditions contained in clauses 3.9.2(e)(1)(ii) and 3.9.2(f). This would help to minimise the risks to system security in cases where extreme market conditions exist that have resulted in automatic load shedding.

The effect of the proposed rule change would be that the dispatch algorithm would determine the price when automatic load shedding occurs based on bids and offers, rather than being artificially determined through the imposition of VoLL. Following a contingency event that results in automatic under-frequency load shedding, NEMMCO would restore load as quickly as possible, while concurrently bearing in mind its overriding obligation to maintain power system security. As load is restored, and reflected in NEMMCO's market systems, the dispatch price would continue to be set in accordance with normal pricing provisions of clauses 3.9.2(c) and (d) on the basis of the marginal cost of supply. As demand is progressively increased, price will be based on the highest priced offer that has been bid into the market, which could approach the price cap as the maximum amount of load that can be restored has been restored.

In this regard, it is notable that, since inception of the NEM, the highest offer in each region has, during all dispatch intervals, been at or close to VoLL. It is also notable that NEMMCO has already provided the AER with a formal undertaking that will see significant improvements regarding the effective operation of NEMMCO's processes and procedures in the management of load restoration and pricing during the restoration period. More particularly, improvements will be made to, among other things, ensure that interrupted load that is capable of being restored is accurately reflected in the market systems and that intervention pricing is appropriately applied when NEMMCO issues directions. NEMMCO will be providing a progress report on these measures to the AER by the end of 2007.

It may be possible that following a contingency event requiring load to be automatically interrupted, a point could be reached where the power system is secure but no more load can be restored. In this scenario, the market-determined price may be lower than the price cap, at least initially. However, it is likely that the periods during which this will be the case will be relatively short-lived. During such periods, as the load is restored, the spot price will approach the price cap based on generator offers. In any event, if the supply shortfall were to

persist for an extended period of time, indicating a sustained supply/demand imbalance, NEMMCO may be required, for example, to interrupt load blocks and to allow others to be restored. The instruction to interrupt load blocks would mean that the conditions for the imposition of VoLL in the case of manual load shedding under clause 3.9.2(e)(1)(i) would be satisfied.

The AER also considers that the rule change proposal would help limit participant's exposure to the market impact of inappropriately setting the dispatch price to VoLL in the case of automatic load shedding when a fundamental supply/demand imbalance does not exist. As explained above, market mechanisms would determine the dispatch price in such cases. There would be no risk of random winners and losers among participants depending upon whether or not they were being dispatched at the time the dispatch price was set to VoLL. In addition, the risk of counter-price flows and negative inter-regional settlement residues when the dispatch price is inappropriately set to VoLL would be limited.

During discussions with the NGF, the NGF agreed that setting the dispatch price to VoLL should be restricted to periods only when there is insufficient generation dispatched to supply an affected area. The NGF noted, however, that clause 3.9.2 (e)(1)(ii) was introduced to ensure that under-frequency load shedding was addressed under the NER in a manner consistent with the treatment of manual load shedding by NEMMCO under clause 3.9.2 (e)(1)(i). The NGF believe that, in the case where interruptible load has been shed due to a contingency event and NEMMCO determines the restoration of that shed load in the next dispatch interval must be limited because the generation able to be dispatched to supply the affected area is insufficient, then NEMMCO should set the dispatch price at that region's regional reference node equal to VoLL to ensure that this scenario was treated identically to the case of a sustained supply/demand imbalance that is currently provided for under clause 3.9.2(e)(1)(i). However, the AER believes that, in this scenario, market mechanisms will ensure that the dispatch price accurately reflects the prevailing supply/demand conditions in such circumstances, limiting the need for intervention by NEMMCO to override the price

In discussing the issue with NEMMCO, it was noted that there are various interpretations of the NER provisions on setting the dispatch price to VoLL in the case of automatic load shedding. NEMMCO agrees with the view of the AER that the current provisions cannot be effectively implemented when power system emergency conditions arise and supports the AER's recommendation for the proposed rule change.

C. EXPLANATION OF CONTRIBUTION TO NEM OBJECTIVE

Under the NER, NEMMCO is responsible for power system security. The AER's proposed rule change would allow NEMMCO to focus solely on returning the power system to a secure operating state in cases where automatic load shedding has occurred. Furthermore, the proposed change would remove the risk of distorting generation dispatch and demand-side response by incorrectly setting prices to VoLL, thereby resulting in more efficient market outcomes.

The current version of the NER requires NEMMCO to concurrently determine whether the dispatch price should be set to VoLL. The assessment of whether or not the dispatch price should be set to VoLL is complex and distracts NEMMCO from its primary task of managing system security.

The AER considers that its proposed amendments would contribute to the NEM objective by promoting the efficient use of energy and the reliability of the power system. Specifically, allowing the market to set the dispatch price following a contingency event would remove the risk of distorting generation dispatch and demand-side response by incorrectly setting prices to VoLL, resulting in more efficient outcomes. The AER also considers that allowing NEMMCO to focus solely on returning the power system to a secure operating state would speed up the process of securing the power system and enhance the system's reliability overall.

D. EXPLANATION OF EXPECTED BENEFITS, COSTS AND IMPACT ON THOSE AFFECTED

The primary benefit of the Rule change proposal is that, in cases where automatic load shedding has occurred following the occurrence of a contingency event, the proposal would allow NEMMCO to focus solely on returning the power system to a secure operating state rather than concerning itself with whether or not the dispatch price should be set to VoLL. The Rule change proposal would also have the consequential benefit of removing the risk of distorting generation and demand-side response through the incorrect setting of the dispatch price to VoLL, which could have an adverse impact upon suppliers and consumers of electricity.

The AER does not consider that the Rule change proposal will impose any additional costs on NEMMCO nor on Participants. On the contrary, the removal of the requirement to set the dispatch price to VoLL in the case of automatic load shedding will mean that NEMMCO will be able to re-direct effort and resources that were formerly focused on assessing compliance with clause 3.9.2(e)(1)(ii) towards the more important task of ensuring power system security is maintained while restoring, as quickly as possible, the interrupted load.

Removal of the requirement to set the dispatch price to VoLL in the case of automatic load shedding will also mean that market mechanisms will ensure that the dispatch price accurately reflects the prevailing supply/demand conditions in such cases. In the AER's view, this will yield a more efficient result which will benefit NEMMCO, suppliers and consumers of energy.

APPENDIX A**RULE CHANGE REQUEST – DETERMINATION OF SPOT PRICES****TEXT OF PROPOSED AMENDMENTS**

1. Amend clause 3.9.2(e) as follows:

(e) Notwithstanding clauses 3.9.2(c) or (d), for any *dispatch interval* if:

(1) the *dispatch price* for that *dispatch interval* has not already been set by the *central dispatch* process and NEMMCO reasonably determines that the *central dispatch* process may determine that all *load* in a *region* could not otherwise be supplied and NEMMCO issues instructions that are current for that *dispatch interval* to *Network Service Providers* or *Market Participants* to shed *load*, then NEMMCO must set the *dispatch price* at that *region's regional reference node* to equal *VoLL*;

(2) NEMMCO has declared a *dispatch interval* to be an *intervention price dispatch interval* under clause 3.9.3(a), then subject to clauses 3.9.3(a2) and 3.9.3(a3) NEMMCO must set the *dispatch price* in accordance with clause 3.9.3; and

(3) **[Deleted]**

(4) an *administered price period* in accordance with clause 3.14 applies, then NEMMCO must limit the *dispatch price* in accordance with clause 3.14.2(c)(1).

2. Delete clause 3.9.2(f).

(f) If *interruptible load* is shed as a result of a *contingency event* and NEMMCO has not set the *dispatch price* to equal *VoLL* pursuant to clause 3.9.2(e)(1)(i), NEMMCO must not set the *dispatch price* to *VoLL* pursuant to clause 3.9.2(e)(1)(ii) prior to the commencement of the third *dispatch interval* following the restoration of the *power system* to a *secure operating state* and the restoration of the *frequency* of the *power system* to the normal band of the *frequency operating standards*.

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