AEMC

RULE

Australian Energy Market Commission

DRAFT RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (APPLICATION OF THE REGIONAL REFERENCE NODE TEST TO THE RELIABILITY AND EMERGENCY RESERVE TRADER) RULE 2019

PROPONENT

Australian Energy Market Operator

15 AUGUST 2019

INQUIRIES

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ABOUT THE AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

SUMMARY

1 The Australian Energy Market Commission (AEMC or Commission) has made a draft rule to amend a provision of the national electricity rules (NER) which determines whether AEMO should implement "intervention pricing" when it intervenes in the market by issuing a direction or activating the reliability and emergency reserve trader (RERT).

2 AEMO has the ability to intervene in the market in certain circumstances - for example to help maintain and/or re-establish the reliability or security of the NEM when regulatory processes or market responses have not delivered desired outcomes. Interventions are to be used as a last resort, consistent with the principle in clause 3.1.4 of the NER that AEMO decision-making should be minimised to allow market participants the greatest amount of commercial freedom to decide how they will operate in the market.

3 Intervention pricing determines the price at which the market clears during an AEMO intervention event (defined as including activation of the RERT and issuance of a direction). It is a pricing approach implemented by AEMO that seeks to minimise market distortion by setting energy and ancillary service prices at the value which AEMO, in its reasonable opinion, considers would have applied if the intervention had not occurred.

4 When AEMO intervenes in the market by activating the RERT, it is required on each occasion to implement intervention pricing. By contrast, when AEMO issues a direction, it is required to determine whether intervention pricing should be implemented having regard to a provision known as the "regional reference node (RRN) test". The RRN is the location in each region at which spot prices are determined by the NEM dispatch engine (NEMDE) and by reference to which marginal loss factors are calculated. RRNs are typically located near the major load centre in each region - i.e. the capital city.

5 The RRN test essentially asks whether a direction issued to a plant at the RRN would have avoided the need for the direction actually issued. If the answer is yes, intervention pricing is applied; if no, intervention pricing is not applied. In December 2018, AEMO submitted a rule change request to amend the RRN test so that it applies to the RERT as well as to directions, and to clarify the meaning of the test.

6 In assessing whether to extend the reach of the RRN test to encompass the RERT, the Commission has considered whether the current test is fit for purpose. To this end, the Commission has analysed experience to date with applying the test, and has examined those elements of the test that have created uncertainty and confusion. The Commission has also considered whether the test is achieving its objective of minimising market distortion in connection with intervention events.

7 Informed by this analysis, the Commission has made a more preferable draft rule which extends the RRN test to encompass the RERT, as proposed by AEMO, and changes the wording of the test to clarify the circumstances in which intervention pricing is to apply. In doing so, the draft rule seeks to create transparency,predictability and consistency for the market, and remove as far as possible the need for AEMO to exercise discretion in determining how to apply the test.

8 The key features of the more preferable draft rule are that it:

- extends the application of the RRN test to the RERT, as proposed by AEMO. This creates consistency in how intervention pricing is applied as between directions and the RERT and avoids imposing higher than necessary prices on consumers in cases where there is no economic rationale for the use of intervention pricing in connection with the RERT.
- clarifies that intervention pricing should apply where an intervention responds to a region wide scarcity of a market traded commodity (i.e. energy or a market ancillary service, noting FCAS is currently the only market ancillary service, or a direct substitute for those services - e.g. reducing generation output to reduce the amount of FCAS required in a region). With the exception of FCAS, a market traded commodity does not include system security services (e.g. system strength or voltage control) as there is no spot market for such services.
- clarifies the circumstances in which a localised deficiency of a market traded commodity should trigger intervention pricing. Consistent with the intent underpinning the current test, the more preferable draft rule makes clear that intervention pricing should not apply where the intervention responds to a localised deficiency of a market traded commodity in a part of the network which effectively (due to a network or other constraint) does not include the RRN. However, where a localised deficiency of a market traded commodity occurs in a part of the network that includes the RRN, intervention pricing should apply. This is appropriate as it is important to preserve scarcity signals where scarcity occurs in a part of the network that contains the major load centre.
- clarifies that intervention pricing should not apply in circumstances where the reason for the intervention is to obtain a service that is not traded in the market (for example system strength, inertia, voltage control), even if the provision of that service results in the provision of energy or market ancillary services as a by-product. This reflects the Commission's view that there is no economic rationale for applying intervention pricing in connection with interventions to obtain a non-market traded commodity because there is no relevant price signal to preserve. The use of intervention pricing in such circumstances can cause rather than reduce market distortion.
- clarifies the approach to be adopted when multiple intervention events coincide. The more preferable draft rule brings the wording of the test into line with the approach adopted by AEMO under its Intervention pricing methodology (an approach with which the Commission agrees) and clarifies, where multiple interventions coincide, which interventions should influence the intervention price and which should not.

9 As set out in tabular form at the end of this summary, the more preferable draft rule outlines the circumstances in which intervention pricing should and should not apply to remove as far as possible the difficulties and uncertainty that have arisen in the application of the test to date. The Commission considers this important because:

- it would not be appropriate to extend the reach of the test to encompass the RERT while such uncertainties persist, and
- recent application of the RRN test has resulted in inefficient market outcomes that are not consistent with the NEO. In particular, the use of intervention pricing in connection

with South Australian system strength directions has resulted in higher than necessary wholesale energy prices and inefficient investment signals. While this effect has been most pronounced in South Australia, with important implications for South Australian consumers, the use of intervention pricing impacts prices across the NEM.

10 When AEMO directs a generator to come online in South Australia to provide system strength services, more energy is injected into the system. This would normally result in a lower spot price but intervention pricing prevents the price of energy falling in the wake of the direction. This approach does nothing to signal the need for system strength in South Australia, nor could it given that there is no spot market for system strength. Instead, intervention pricing seeks to signal the value of system strength via the energy price. The Commission is concerned that intervention pricing is producing inaccurate price signals when used in connection with system strength directions (and directions for other security services, such as voltage control, which are not traded in the market). This is because intervention pricing seeks to signal scarcity of system strength by changing the price of energy at a time when energy is not scarce.

11 Informed by these higher energy prices, new entrants may invest in additional capacity regardless of whether those investments support or undermine system strength. (While the "do no harm" framework addresses the location specific impacts of new connecting asynchronous generators, it does not address the wider impacts of such connections on the merit order and the viability of synchronous generators.) In this way, efforts to reduce market distortion through intervention pricing have the unintended effect of producing inefficient investment signals as well as higher costs to consumers (due to the market clearing at the higher intervention price). Inaccurate investment signals may result in investment in energy capacity that does not support system strength at a systemic level. This in turn can impose additional costs on consumers if further investments (e.g. network assets) are subsequently required to address declining levels of system strength. Such outcomes are not consistent with the NEO and the more preferable draft rule therefore seeks to remove them.

12 The Commission also notes that, notwithstanding changes made to the intervention pricing methodology in response to AEMO's review of intervention pricing, the complex method used to determine intervention prices can still lead to unexpected outcomes. For example, in early May 2019, intervention prices were for several hours strongly negative and lower than the prices produced by the "dispatch run" (the run of the NEM dispatch engine - NEMDE - which is used to determine dispatch targets but does not set the price at which the market clears).

13 Such outcomes are not intended and highlight the difficulty of setting prices based on a counterfactual. The Commission also notes that, as the counterfactual used to set intervention prices during a system security direction does not include the generators dispatched pursuant to the direction/s, it represents an insecure system that would not be allowed to be realised in practice. This is not considered a sound basis on which to set prices in such circumstances and compounds the Commission's concern about using intervention pricing in connection with directions for system security services which are not traded in the market.

Figure 1: Services that will and will not trigger intervention pricing under the draft rule

Service obtained under the intervention	Intervention pricing?
Service for which a dispatch price or ancillary service price is determined (i.e. energy or FCAS)	yes
A service that is a direct substitute for energy or FCAS (e.g. directing a generator to reduce output where insufficient FCAS is available)	yes
Energy or FCAS to address a localised deficiency that coincides with the RRN	yes
Energy or FCAS to address a localised deficiency in a part of the region that does not include the RRN due to a network or other constraint	no
Service for which a dispatch price or ancillary service price is not determined: for example, inertia, voltage control, system strength, non-market ancillary services (i.e. NSCAS and SRAS)	no

Source: AEMC

CONTENTS

APPENDICES

TABLES

FIGURES

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

On 17 December 2018, AEMO submitted a request to the Australian Energy Market Commission (AEMC or Commission) to extend the application of the regional reference node (RRN) test to the reliability and emergency reserve trader (RERT). Currently, the RRN test applies only to directions and is used to determine whether AEMO should apply "intervention pricing" when it issues a direction. Intervention pricing is a practice designed to minimise market distortion by preserving price signals at levels that AEMO considers would have been seen by the market had the intervention not occurred.

To determine whether intervention pricing should be implemented, the RRN test essentially asks whether a direction issued to a plant at the RRN would have avoided the need for the actual direction issued. If the answer is no, AEMO should not implement intervention pricing. If the answer is yes, AEMO should implement intervention pricing. For example, if directing a plant near Brisbane would not have solved a problem in far north Queensland, there is no value in preserving price signals at the RRN because the problem is localised and does not signal a region-wide scarcity for which market price signals should be preserved. As a result, intervention pricing is not applied. Further information regarding the RRN test and experience with its application to date is set out in chapter 2.

The AEMO rule change request proposes to extend the RRN test so that it applies consistently to directions and the RERT. This will avoid imposing higher than necessary wholesale energy costs on consumers when the RERT is activated in circumstances where there is no reason to apply intervention pricing. AEMO also proposes amendments to the wording of the current test to improve clarity.

In assessing whether to extend the reach of the RRN test to encompass the RERT, the Commission considers it important to ensure at the outset that the test is fit for purpose. To this end, the Commission has analysed experience to date with applying the test, and in particular has examined those elements of the test that have created uncertainty and confusion. The Commission has also considered whether the test is achieving its objective of minimising market distortion in connection with intervention events.

The Commission's draft rule determination is to make a more preferable rule which extends the application of the RRN test to the RERT and changes the wording of the test to clarify the circumstances in which intervention pricing is to apply. The more preferable rule preserves and clarifies the current approach whereby intervention pricing is not to apply if the intervention is to address a localised issue (save for where the localised issue coincides with the RRN). The draft rule also makes clear that, where the intervention is to obtain a service that is not traded in the spot market (i.e. a service other than energy or a market ancillary service), intervention pricing should not apply since there is no relevant market price signal to preserve.

The AEMC published a consultation paper on the rule change request on 4 April 2019 and this draft determination is informed by stakeholder submissions to that consultation paper and the Commission's analysis.

This paper provides:

- a summary of, and background to, the rule change request and the RRN test
- a summary of the Commission's reasons for making the rule
- an assessment of the issues identified in the consultation paper.

1.2 Background and rule change request

This section provides background to the rule change request. It also explains:

- the interventions framework set out in the National Electricity Rules (NER)
- the changing nature of interventions.

1.2.1 Interventions framework

The purpose of interventions is to help maintain and/or re-establish the reliability and security of the NEM when regulatory processes or market responses have not delivered desired outcomes. Reliability relates to whether the power system has an adequate amount of capacity (generation, high voltage transmission network and demand response) to meet consumer needs. This is distinct from the concept of security whereby a secure power system is one that operates within defined technical limits.

The reliability framework, which includes the reliability settings such as the market price cap, cumulative price threshold, administered price cap and market floor price, is designed to deliver reliability consistent with the level of the reliability standard set out in clause 3.9.3C of the NER.[1] However, in operating the power system AEMO is expected to try to avoid any unserved energy (i.e. load shedding) in real time,[2] including by using the intervention mechanisms available to it if necessary. Intervention mechanisms also enable AEMO to deal with system security issues by intervening in the market in certain circumstances.

The interventions framework broadly comprises the RERT, "directions" and "instructions".[3] However, an "AEMO intervention event" is defined in chapter 10 of the NER to include only the RERT and directions, not instructions. The RERT allows AEMO to contract for emergency reserves (generation or demand-side capacity that is not otherwise available to the market). AEMO can use these emergency reserves in the event that it determines that market participants are not meeting the reliability standard (i.e. the level of reliability that the market is expected to provide).

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1 The reliability standard for generation and inter-regional transmission is a maximum expected unserved energy (USE) in a region of 0.002 per cent of total energy demanded in that region for a given financial year.

2 See Clause 4.2.7 of the NER - AEMO is required to keep the system operating to a reliable operating state which implies no unserved energy.

3 Directions and instructions are both issued under clause 4.8.9 of the NER. "Directions" is defined in chapter 10 of the NER as having "the meaning given in clause 4.8.9(a1)(1)". The equivalent definition for instructions refers to a "clause 4.8.9 instruction" which is defined as having "the meaning given in clause 4.8.9(a1)(2)". In this draft determination, "clause 4.8.9 instructions" are referred to henceforth as "instructions". It is noted that direction is also a term used in s. 116 of the National Electricity Law. While not defined in the NEL, "direction" in s. 116 of the NEL has a broader meaning than in the NER and encompasses both directions, as defined in the NER, and clause 4.8.9 instructions. Under clause 4.8.9, the key difference between directions and instructions is that directions involve requiring registered participants to take action in relation to scheduled plant or a market generating unit, while instructions require registered participants to take "some other action" - i.e. other than in relation to scheduled plant or market generating units.

AEMO can issue directions to maintain system security and/or a reliable operating state. For example, AEMO may direct a scheduled generator to increase its output, cancel or shift an outage, or remain synchronised. A registered participant must use its reasonable endeavours to comply with a direction or clause 4.8.9 instruction unless to do so would, in the registered participant's reasonable opinion, be a hazard to public safety, or materially risk damaging equipment, or contravene any other law.[4] Instructions are another form of market intervention available to AEMO. These are typically used to instruct a transmission network service provider to shed load involuntarily as a last resort.

Intervention mechanisms are an acknowledged and important feature of the market design but, consistent with the market design principle in clause 3.1.4(a)(1) of the NER, they are to be used as a last resort.[5] The frequent use of such mechanisms raises important questions as to the flow-on effects for investment signals and investor confidence, as well as costs for consumers.

1.2.2 The changing nature of interventions

Low system strength has emerged as an issue in South Australia as the generation mix in that region shifts from one dominated by synchronous generators to one with a growing proportion of asynchronous renewable generation. Currently, low system strength in South Australia is addressed through AEMO issuing directions to synchronous generators to operate in order to meet minimum system strength requirements. As at 31 July 2019, around 267 directions had been issued to South Australian generators to maintain system strength, representing an unprecedented use of this intervention mechanism.

For the first time in November 2018, AEMO issued a direction to a generator in Victoria to maintain system strength in that region.[6] This highlights that low system strength can be expected to pose challenges in NEM regions other than South Australia in the near to mid-term.

When AEMO intervenes in the market in this way, it generally implements "intervention pricing", a practice which has important implications for wholesale electricity prices, both in South Australia and across the NEM, signals to investors, and costs faced by consumers.[7]

The increasing use of interventions in South Australia and Victoria has drawn attention to these issues and prompted AEMO to submit a number of rule change requests relating to the interventions and related compensation frameworks, including the rule change request that is the subject of this draft determination.

There has also been increased reliance on the RERT to address anticipated supply shortfalls. The RERT was activated for the first time in November 2017 and since then has been used in January 2018 and again (on two days) in January 2019.

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4 NER, clause 4.8.9(c).

5 This principle is to minimise AEMO decision-making to allow market participants the greatest amount of freedom to decide how they will operate in the market.

6 AEMO, System strength directions briefing, 23 November 2018.

7 There have been a limited number of occasions on which intervention pricing has not been applied as a result of the RRN test - these are discussed further in chapter 2.

1.3 Related work

In light of the growing number of directions being issued by AEMO to maintain system strength in South Australia, the AEMC is undertaking an investigation into intervention mechanisms and system strength in the NEM. As part of this investigation the AEMC is considering whether changes to both the interventions framework and system strength framework are warranted to support the power system in the most efficient manner possible and minimise the need for AEMO interventions.

A consultation paper for the investigation was published on 4 April 2019 and 21 submissions were received in response.

On 15 August 2019, the Commission published a final report on the intervention aspects of the investigation which sets out a number of recommendations to amend the interventions and compensation frameworks.

Also on 15 August, the Commission published both this draft determination and a draft determination for a related rule change request submitted by AEMO which seeks to amend the compensation framework in relation to the threshold for participant compensation following market intervention.[8]

The AEMC also a made a final rule on 30 May 2019 which streamlines the cost recovery process following an intervention event by aligning the timetables for compensation and settlement. The rule also extends the deadline for participants to make additional compensation claims following an intervention, thereby allowing participants more time to assess the impact of intervention events.[9]

8 Further information is available on the AEMC website: https://www.aemc.gov.au/rule-changes/threshold-participant-compensation-following-market-intervention

9 AEMC, Intervention compensation and settlement processes, available at: https://www.aemc.gov.au/rule-changes/intervention-compensation-and-settlement-processes

2 BACKGROUND TO THE REGIONAL REFERENCE NODE TEST

This chapter discusses the origins of the regional reference node (RRN) test, how it has been applied to date, and issues that need to be considered in assessing AEMO's rule change request.

2.1 Introduction

In order to preserve scarcity signals to the market, AEMO implements intervention pricing when it intervenes in the market by activating the Reliability and Emergency Reserve Trader (RERT) or issuing a direction.

Before AEMO implements intervention pricing in connection with a direction, it must form a reasonable opinion as to whether the "regional reference node test" (RRN test) is met: that is, would a direction issued to plant at the RRN have avoided the need for the actual direction issued?[10] If the answer is no, then intervention pricing should not be applied. For example, if directing a plant at the Queensland RRN near Brisbane would not have avoided the need to issue a direction to address a localised problem in northern Queensland, then intervention pricing should not apply.

2.1.1 What is the regional reference node test?

Clause 3.9.3(d) of the NER states that:

> *AEMO* must continue to set *dispatch prices* pursuant to clause 3.9.2 and *ancillary service prices* pursuant to clause 3.9.2A if a *direction* given to a *Registered Participant* in respect of *plant* at the *regional reference node* would not in *AEMO's* reasonable opinion have avoided the need for any *direction* which constitutes the *AEMO intervention event* to be issued.

In other words, if directing a plant at the RRN would not have removed the need for the intervention, then AEMO does not apply intervention pricing.[11]

AEMO's rule change request describes the RRN test as recognising "that the scarcity price signal at the RRN serves no purpose where action at the RRN could not have prevented the direction. Put another way, scarcity price signals are not appropriate where a direction is issued for plant at a specific location on the network to resolve a localised condition".[12]

10 The regional reference node (RRN) is the location in each region by reference to which marginal loss factors are calculated, and at which spot prices are determined by NEMDE. With the exception of Tasmania, RRNs are located near the capital cities in each region of the NEM. See table 2.1 for more detail.

11 SW Advisory, op cit, p. 6.

12 AEMO, *Electricity Rule Change Proposal - Regional Reference Node Test following activation of the RERT*, November 2018, p. 3. This request was submitted to the AEMC on 17 December 2018.

2.1.2 History of the test

The origin of the RRN test lies in changes made to the directions framework as it existed when the NEM commenced operation in 1998. At that time, the National Electricity Code (the predecessor of the NER) included separate frameworks for directions relating to breach of reliability, security and statutory obligations. Intervention pricing was implemented for directions relating to reliability but not in relation to security directions.

A review of directions in 2000 made a number of recommendations, including that:[13]

- the separate arrangements for reliability, security and statutory obligation directions should be consolidated into a single common arrangement, thereby reducing the level of discretion required to be exercised by NEMMCO in determining whether a direction is a reliability, security or statutory obligation direction
- in the event of a direction, market prices should so far as practicable be set on a "what-if" basis in order to retain the appropriate price signal in the market and provide an incentive for market-based response in the future

The review report further noted that, in applying "what-if" pricing, a distinction should be drawn between "regional and local directions". It stated:[14]

> A regional deficiency may be redressed by a direction to a participant anywhere in the region. Use of a what-if price for the region will therefore signal the region wide deficiency. On the other hand, a localised deficiency can only be redressed locally. As there is no regional deficiency it is inappropriate for the regional market price to indicate a shortfall... Accordingly, what-if prices will not be calculated for localised directions.

The wording of the current RRN test does not clearly articulate or reflect this original policy intent. Instead, its reference to "plant at the regional reference node" has prompted decisions to be made based on the physical circumstances pertaining to each case, rather than on whether the application of intervention pricing in a given case is consistent with the policy intent underpinning the test.

Thus, in the case of South Australia, intervention pricing is used in connection with system strength directions because the system strength issue can be addressed by directing Torrens Island Power Station, which happens to be located at the RRN.[15] However, if the same issue were to arise in New South Wales or Queensland, the outcome would likely be different because directing plant at the node in those regions would be unlikely to address system strength issues.

Arguably, one of the goals of the 2000 review (namely, reducing the discretion required to be exercised by the system operator) has not been achieved. Rather than exercising discretion in determining whether the direction in question is a reliability or a security direction (as was the case prior to the 2000 review), AEMO now has to exercise discretion as to whether the

13 NEMMCO and NECA, *Power system directions in the National Electricity Market*, May 2000.
14 ibid, p. ii
15 AEMO, *Electricity Rule Change Proposal - Regional Reference Node Test following activation of the RERT*, November 2018, p. 4.

RRN test is met and intervention pricing should or should not apply. Events in Victoria in November 2018, and earlier events in South Australia (in particular on 1 December 2016), demonstrate that the current test is unclear and can be interpreted in a number of ways, as discussed further below.

2.2 AEMO guidance on the RRN Test

There is limited guidance in AEMO documents as to how to apply the RRN test – that is, how AEMO should form the requisite reasonable opinion that a direction to a plant at the RRN would have avoided the need for any direction which constituted the intervention event.

An AEMO briefing paper dated March 2011 states (emphasis added):[16]

> For some interventions the Rules [clause 3.9.3(d)] provide that intervention pricing is not invoked and normal price setting continues. **These circumstances apply in situations where equivalent intervention in respect of plant located at the regional reference node would not have removed the need for the intervention actually given**. Thus, if a generator is directed to operate its generating plant to address a supply deficiency that is confined to a part of the network that does not include the regional reference node, then intervention pricing is not invoked. This might occur for example if a network constraint was restricting supply to a remote area near the directed generator.

This description envisages a situation where a network constraint effectively separates one part of the network in a given region from the rest of that network (and the RRN is located in the latter part). However, the manner in which the RRN test has been applied in practice does not always appear consistent with this approach, given that, in some cases, there is no relevant network constraint effectively separating the RRN from other parts of the network.

2.3 How has the regional reference node test been applied to date?

To our knowledge, there have only been four occasions when intervention pricing was not applied as a result of the RRN test – on 13 October 2015, 1 December 2016, 28-29 March 2017 and 16-18 November 2018. These occasions are set out in Appendix A and highlight the difficulty that has been experienced to date with applying the RRN test in a consistent manner.

While AEMO is required to apply the RRN test each time it intervenes in the market by issuing a direction, there is limited discussion in its market event reports as to how the test has been applied. There are some exceptions, also discussed in Appendix A.

2.3.1 System strength directions in SA

The consultation paper noted that the market event reports then available regarding system strength directions in South Australia do not refer to the RRN test or how it is applied. Each

16 AEMO, *Briefing paper - operation of the intervention price provisions in the National Electricity Market*, March 2011, p. 4

report simply includes the following text under the heading "Application of intervention pricing":[17]

> AEMO declares intervention pricing for periods subject to an AEMO intervention event. Under intervention pricing, NER 3.9.3(b) requires that AEMO set the dispatch price and ancillary service prices at the value which AEMO, in its reasonable opinion, considers would have applied had the intervention event not occurred. AEMO determines and publishes these prices in accordance with the Intervention Pricing Methodology.

AEMO's view is that the RRN test is met in connection with the South Australia system strength directions and thus it is appropriate to apply intervention pricing. AEMO's approach (generally and as it relates to the South Australian and Victorian contexts) is set out in its rule change request as follows:[18]

> AEMO's practice is to apply the RRN test considering the following practical considerations:
>
> - There is no distinction in the test between "reliability" or "security" directions.
> - The RRN test does not require the existence of a real physical unit to be directed and that the test can be applied to a notional unit at the regional reference node.
> - Generally, directions to resolve "local" issues do not require use of intervention pricing. However, where a local issue coincides with the regional reference node, intervention pricing is applied.
> - System strength directions in South Australia require one of a number of combinations of units to be directed. One of these combinations involved only units at Torrens Island Power Station, which is located at the regional reference node. Thus the test is passed for all combinations and intervention pricing is required.
> - Recent directions in Victoria to address voltage control and reactive power reserves have been given to address a specific local issue at Keilor 500kV Terminal Station. AEMO did not initially apply intervention pricing to these directions, but has subsequently done so on the basis that the provision of reactive power from a unit at the RRN would have resolved the issue. AEMO is currently developing a position paper for broader discussion with the market.
> - The RRN test is only met if all directions that relate to an AEMO intervention event could have been substituted by a direction at the regional reference node.

Since the publication of the consultation paper, AEMO has published a number of market event reports, and the Commission acknowledges AEMO's efforts to catch up on the publication of such reports. These more recent reports include a more detailed discussion regarding intervention pricing, set out below.[19]

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17 See for example AEMO, *NEM Event - Direction 07-16 April 2018*, July 2018, p. 9.

18 AEMO, *Electricity Rule Change Proposal*, op cit, p. 4.

19 AEMO, *NEM Event – Direction 13-17 June 2018*, May 2019, p. 7.

> Intervention pricing applies whenever the direction meets the regional reference node test, that is a direction hypothetically given to a plant at the regional reference node would have avoided the need for the direction.
>
> AEMO's transfer limit advice on South Australia System Strength provides a number of feasible combinations of generating units that provide the needed level of system strength. All combinations of plant in the limit advice could be fully substituted by directing at the regional reference node (Torrens Island) in the current system strength scenarios. Accordingly, system strength directions in South Australia pass the regional reference node test and intervention pricing is appropriate.

While the rule change request states "the RRN test does not require the existence of a real physical unit to be directed and that the test can be applied to a notional unit at the regional reference node", the above illustrates the tendency to rely on the existence of an actual plant at the node in applying the test.

2.3.2 System security directions issued in Victoria in November 2018

AEMO issued directions in Victoria in November 2018 to address issues relating to both voltage control and system strength. The first direction to address voltage control concerns was issued to Newport power station (located close to but not at the RRN) late on 16 November 2018. This was considered a localised issue and intervention pricing was not applied. However, this direction was later extended (on 17 November) to address inadequate system strength. (This is the first time that AEMO has issued a direction in Victoria in response to inadequate system strength.) Intervention pricing was applied in connection with that portion of the direction to Newport.

The next day, 18 November, AEMO again issued a direction in response to voltage control issues. This direction was issued to Mortlake power station (located in western Victoria, far from the RRN) and intervention pricing was not applied.

In a written briefing to industry following these events, AEMO indicated that "going forward, AEMO intends to apply intervention pricing for system strength directions in Victoria. AEMO is considering its position on the application of the NER intervention pricing provisions for voltage control in Victoria".

On 24-26 November 2018, directions were again issued in Victoria to address voltage control issues and intervention pricing was applied (in contrast to the initial weekend). Subsequently, AEMO has indicated it intends to apply intervention pricing in relation to both system strength and voltage control issues for the reasons set out below.[20]

> For system strength directions in both South Australia and Victoria, AEMO is satisfied that sufficient synchronous machines at the respective RRNs would remove the need to direct plant in other places in the regions. AEMO will therefore continue to apply intervention pricing for the period of those directions.

20 AEMO, *Intervention pricing for system security directions - position paper for the NEM*, December 2018, p. 5.

> For voltage control directions in Victoria, in relation to the recent high voltage issues, AEMO is satisfied that synchronous reactive plant at the Victorian RRN region reference node would avoid the need to direct elsewhere in the region. AEMO will therefore apply intervention pricing for similar directions going forward.
>
> AEMO has not attempted to examine the economic merits of such an approach. These are best dealt with through policy setting for the NEM.

As with the discussion of the RRN test in the AEMO rule change request, the briefings provided to industry allude both to notional and actual plants at the RRN. At a theoretical level, the application of the test is often described as relating to a notional plant. However, in practice, AEMO tends to have regard for the location of the actual plant involved and whether the location of that plant coincides with the RRN.

The AEMO position paper also notes that:[21]

> There is a broader concern as to whether intervention pricing applied in situations where there is no shortage of general generation available (energy or FCAS), distorts price signals seen by potential investors. It is arguable that this goes against what intervention pricing is intended to achieve - that is, avoiding market distortions. However, it is also arguable that the aim of the 2002 code change was to apply what-if pricing as far as possible for any intervention as a consistent arrangement for the use of directions, if they alter market (energy or ancillary service) outcomes. AEMO considers this to be a policy consideration that is best considered as part of a coordinated review.

2.4 What is a "plant at the RRN"?

The RRN test refers to "a *direction* given to a *Registered Participant* in respect of *plant* at the *regional reference node".* In its rule change request, AEMO describes the substance of the test in the following terms: "intervention pricing does not apply where, in AEMO's reasonable opinion, the need for a direction issued in respect of a particular plant could not have been avoided by issuing a direction to (hypothetical or real) plant at the RRN".

Plant is defined in the NER as including (among other things) controllable generating equipment and controllable loads. The Commission notes that, while the RRN test refers to "plant at the RRN", this needs to be read in the context of clause 4.8.9(a1)(1) which provides that AEMO may direct a registered participant to take action in relation to "scheduled plant" (defined as scheduled and semi-scheduled generators, scheduled network services and scheduled load). Thus, AEMO does not have power to direct a registered participant to take action in relation to "plant" which is more broadly defined in chapter 10 than "scheduled plant".

While the NER do not make clear whether the test relates to a hypothetical or actual plant, it may be reasonable to interpret the current RRN test as referring to a hypothetical plant,

21 ibid.

particularly given that in only some regions is there an actual generating plant located at or near the RRN. This appears consistent with the 2011 Briefing Paper's reference to "equivalent intervention" and AEMO's view of the test, as set out in section 2.3.1. In particular, AEMO states in its rule change request that the RRN test "does not require the existence of a real physical unit to be directed and that the test can be applied to a notional unit at the regional reference node".[22] This reflects the view of some that the test can be met by a direction issued to a plant which is "located" at the RRN in an electrical sense, if not a geographical sense (i.e. the plant is connected to the same line as the RRN, and there is no constraint between it and the RRN). The RRNs for each region in the NEM are shown in table 2.1.

Table 2.1: Regional Reference Nodes for each region of the NEM

REGION	RRN
Queensland	South Pine 275kV node
New South Wales	Sydney West 330kV node
Victoria	Thomastown 66kV node
South Australia	Torrens Island PS 66kV node
Tasmania	George Town 220 kV node

With the exception of Tasmania, the RRNs for each region of the NEM are located close to the region's major load centre (the capital city). In Tasmania, the RRN is located at the southern end of the Basslink interconnector.

In Victoria, there is a 1 MW landfill gas generator located very close to the RRN and Newport station (with a capacity of 500MW) is located within 25kms of the RRN. Other large generators are located well away from the RRN. In NSW, a 185MW CCGT plant is located near the RRN but, as with Victoria, other large generators are located well away from the RRN. In Queensland, the closest large generator is around 60km from the RRN (Swanbank power station with a capacity of 385MW). South Australia is unique in that there are a number of large generators (including Torrens Island and Pelican Point) located at or near the RRN. In other regions, the large generators are generally located well away from the capital cities.

Given this, it is reasonable to infer that the RRN test is referring to a hypothetical situation where a direction is issued to a registered participant in respect of a notional plant located at the RRN. In addition to AEMO's views noted above, this would appear consistent with the origins of the test, discussed in section 2.1.2.

However, the wording of the RRN test is silent on this issue and has proved difficult to apply in practice. Despite the case for interpreting the test by reference to a notional plant at the RRN, there are repeated instances of the test being applied by reference to actual plant at the RRN. This highlights the difficulty that can be expected to arise if the current test needs

22 AEMO, *Electricity Rule Change Proposal*, op cit, p. 4.

to be applied in connection with system strength directions in regions like NSW and Queensland.

The Commission considers that greater clarity would avoid confusion and make clear to the market the intended approach, enabling an appropriately consistent approach to intervention pricing across the NEM.

2.5 What happens when intervention pricing is not applied?

If intervention pricing is not applied in connection with a direction (as occurred in relation to the directions to Mortlake in December 2016 and Mt Stuart in March 2017 - see Appendix A), the spot price and ancillary service prices are set as normal by the central dispatch process. Parties who provide energy and market ancillary services under direction are still compensated at the 90th percentile price but the market clears as normal, not as per the intervention price.

Clause 3.9.1(a)(3A) provides that:

> Generating units, scheduled network services or scheduled loads which operate in accordance with a direction are to be taken into account in the central dispatch process, but the dispatch offer, in the case of a generating unit or scheduled network service, which operates in accordance with a direction, or the dispatch bid, in the case of a scheduled load which operates in accordance with a direction, will not be used in the calculation of the dispatch prices in the relevant dispatch interval.

There is an equivalent provision relating to ancillary services: clause 3.9.1(a)(3C). Thus, the marginal cost of a directed generator does not set the spot price.

If intervention pricing was not applied in South Australia when system strength directions are issued, then the spot price could be expected to fall to some degree because additional supply has been brought into the market. (As noted by stakeholders in response to the consultation paper, the market can be expected to self correct to some degree when this occurs.[23]) The spot price would not rise to reflect the marginal cost of the more costly thermal generator that has been brought on line in response to the direction, consistent with clause 3.9.1(a)(3A) above.

This is theoretically consistent with another provision of the NER which provides that, when a generator is directed to provide services, it does not receive the trading amount for the intervals during which the direction is in force. Instead, AEMO keeps these trading amounts and a generator directed to provide energy or market ancillary services is paid the 90th percentile price (based on prices in that region in the preceding 12 months): see clause 3.15.6(b). Thus, the directed generator neither sets nor receives the spot price.[24]

23 See AEMC, *Investigation into intervention mechanisms - final report*, August 2019, section 3.2.1.

24 Where a generator is directed to provide services other than energy or market ancillary services they are compensated based on a fair payment price determined by an independent expert: Clause 3.15.7A of the NER.

3 AEMO'S RULE CHANGE REQUEST

3.1 The rule change request

On 17 December 2018, AEMO made a request to the Australian Energy Market Commission (AEMC or Commission) to make a rule regarding the application of the RRN test to the RERT (rule change request). In the rule change request, AEMO proposes to extend the reach of the RRN test to encompass the RERT in addition to directions and to clarify the wording of the test to remove ambiguity.[25]

AEMO notes that, currently, intervention pricing is applied whenever the RERT is activated, regardless of whether there is value in a scarcity price signal at the RRN. AEMO proposes that the approach currently applied to directions (namely, the application of the RRN test) should also apply when the RERT is activated. Reducing the application of intervention pricing in connection with the RERT "would prevent the application of higher intervention prices for all intervention events where there is no value in a scarcity price signal at the RRN. This has the potential to reduce costs for consumers."[26]

AEMO considers that, in this way, the proposed rule change would mitigate additional market costs that would arise from exercising the RERT under conditions that do not satisfy the RRN test. Such outcomes are said to directly promote the National Electricity Objective (NEO) by "maintaining the efficient operation of electricity services for the long term interests of consumers with respect to price and security of supply."[27]

In relation to the wording of the test, AEMO notes that "the current drafting of the RRN test has proved difficult for AEMO to interpret. AEMO proposes to improve the drafting of the test by removing double negatives and redundant cross references. These changes are not intended to alter the meaning or application of the test."[28]

AEMO notes that the rule change request has been developed in discussion with the Intervention Pricing Working Group (established by AEMO to assist with its review of intervention pricing), members of which supported extending the application of the RRN test to encompass the RERT.[29] The Commission notes, however, that the proposed amendments to the wording of the RRN test were not presented to or discussed with the IPWG. AEMO notes that the proposal to extend the RRN test to encompass the RERT was also presented to the NEM Wholesale Consultative Forum.

3.2 Solution proposed in the rule change request

AEMO's rule change request proposes to address the issues noted above by amending clause 3.9.3(d) in the manner set out below (shown in mark-up):[30]

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25 The rule change request is available at https://www.aemc.gov.au/rule-changes/application-regional-reference-node-test-reliability-and-emergency-reserve-trader

26 AEMO, *Electricity Rule Change Proposal,* op cit, p. 5.

27 ibid, pp. 5-6.

28 ibid p. 4.

29 AEMC staff attended meetings of the IPWG as an observer.

30 AEMO, Rule change proposal, op cit, p. 6

AEMO must continue to set *dispatch prices* pursuant to clause 3.9.2 and *ancillary service prices* pursuant to clause 3.9.2A if AEMO is satisfied that the need for the AEMO intervention event could not have been met by a direction to provide energy or market ancillary services ~~given to a *Registered Participant* in respect of *plant*~~ at the *regional reference node* ~~would not in AEMO's reasonable opinion have avoided the need for any *direction* which constitutes the *AEMO intervention event* to be issued~~.

The Commission considers that the proposed amendments to the clause do impact the substance of the test, as discussed in section 5.2.

3.3 The rule making process

On 4 April 2019, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.[31] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 16 May 2019.

The Commission received 21 submissions as part of the first round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination.

3.4 Consultation on draft rule determination

The Commission invites submissions on this draft rule determination, including a more preferable draft rule, by 26 September 2019.

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 22 August 2019.

Submissions and requests for a hearing should quote project number ERC0253 and may be lodged online at www.aemc.gov.au.

31 This notice was published under s.95 of the National Electricity Law (NEL).

4 DRAFT RULE DETERMINATION

4.1 The Commission's draft rule determination

The Commission's draft rule determination is to make a more preferable draft rule. The more preferable draft rule extends the RRN test to apply to the RERT, as proposed by AEMO, and makes a number of changes to the wording of the test to make clear the circumstances in which intervention pricing is to apply. In particular, the draft rule makes clear that intervention pricing should not apply in circumstances where the intervention is to obtain a service that is not traded in the market. This is because, in such cases, there are no relevant market prices to preserve and the use of intervention pricing in such cases can cause rather than reduce market distortion.

The Commission's reasons for making this draft determination are set out in section 4.4.

This chapter outlines:

- the rule making test for changes to the NER
- the more preferable rule test
- the assessment framework for considering the rule change request
- the Commission's consideration of the more preferable draft rule against the national electricity objective.

Further information on the legal requirements for making this draft rule determination is set out in Appendix B.

4.2 Rule making test

4.2.1 Achieving the NEO

Under 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 national electricity objective (NEO).[32] This is the decision making framework that the Commission must apply.

The NEO is:[33]

> 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.

Having regard for the issues raised by the rule change request, the Commission considers that the relevant aspects of the NEO are efficient investment in electricity services and the price of supply of electricity. The issue of investment relates to the RRN test rule change request since the use of intervention pricing has a bearing on investment signals while the

32 Section 88 of the NEL.
33 Section 7 of the NEL.

price of electricity is relevant to the rule change request as intervention pricing has a bearing on costs passed through to consumers.

4.2.2 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO than the proposed rule.

In this instance, the Commission has made a more preferable draft rule. The reasons are summarised below.

4.2.3 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

As the rule relates to parts of the NER that currently do not apply in the Northern Territory, the Commission has not assessed the rule against the additional elements required by the Northern Territory legislation.[34]

4.3 Assessment framework

In assessing the rule change request against the NEO the Commission has considered the following principles:

- Consistency with objectives: will the application of the test achieve its intended objective?

  The Commission has had regard for whether the current RRN test is achieving the objective of reducing market distortion in connection with intervention events or whether the application of the test in its current form is increasing market distortion. The Commission concludes that the test is not achieving the purpose for which it was created and needs to be amended in order to reduce market distortion by preserving only those price signals that are directly relevant to the services obtained pursuant to an intervention.

34 From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT. (See the AEMC website for the NER that applies in the NT.) National Electricity (Northern Territory) (National Uniform Legislation) Act 2015.

- Clarity, predictability and consistency: is the RRN test easy to apply and are the outcomes predictable and consistent across the NEM?

  The Commission has examined elements of the test that have proven particularly hard to apply in practice: for example, what is meant by the phrase "at the node", the reference to "any direction", and should the test be applied having regard for a notional or actual plant at the node? In developing the more preferable draft rule, the Commission has sought to clarify the wording of the test such that it can deliver appropriately consistent pricing outcomes across the NEM, regardless of the circumstances pertaining to a given intervention or region.

- Efficiency and effect on incentives: will the application of the test result in prices and investment signals that are distorted or accurate/efficient?

  A key focus of the Commission's analysis has been to examine the impact on market outcomes of the RRN test and the resultant use of intervention pricing. The Commission concludes that the test needs to change in order to make clear that intervention pricing should not apply in circumstances where its use would create inaccurate investment signals. For example, in the case of South Australia system strength directions, the Commission considers that the use of intervention pricing is producing inaccurate signals as to the value of energy. This could result in inefficient investment in capacity which contributes to declining levels of system strength.

- Equity: will the application of the test result in outcomes that are equitable, noting intervention pricing results in higher costs to consumers?

  The application of the RRN test and resultant use of intervention pricing has important implications for the costs borne by consumers and thus the achievement of the NEO. The Commission considers that intervention pricing has resulted in higher than necessary wholesale energy prices. Given that these price impacts have been observed for a significant proportion of time (30 per cent of the year in 2018), it is reasonable to expect that they are placing upward pressure on contract prices and thus prices passed through to consumers. These higher prices have been paid to generators which typically do not contribute to system strength and which are not required to contribute to the cost of compensating directed participants (whose output enables them to operate). The Commission concludes that this outcome is not equitable and that, to reduce such impacts (as well as removing inefficient investment signals), the RRN test should be amended so that intervention pricing only applies where there is an economic rationale for its use.

4.4 Summary of reasons

The more preferable draft rule made by the Commission is attached to and published with this draft rule determination. The key features of the more preferable draft rule are that it:

- extends the application of the RRN test to the RERT, as proposed by AEMO. This creates consistency as between directions and the RERT and avoids imposing higher than necessary prices on consumers in cases where there is no economic rationale for the use of intervention pricing.

- clarifies that intervention pricing should apply where an intervention responds to a region wide scarcity of a market traded commodity (i.e. energy or FCAS, or a direct substitute for those services - e.g. reducing generation output in order to reduce the amount of FCAS required in a region)
- clarifies the circumstances in which a localised deficiency of a market traded commodity should trigger intervention pricing. Consistent with the current test, the more preferable draft rule makes clear that intervention pricing should not apply where the intervention responds to a localised deficiency of a market traded commodity in a part of the network which effectively (due to a network or other constraint) does not include the RRN. However, where a localised deficiency of a market traded commodity occurs in a part of the network that effectively contains the RRN, intervention pricing should apply. This is appropriate as it is important to preserve scarcity signals where scarcity occurs in a part of the network that contains the major load centre. The more preferable draft rule does not include the phrase "plant at the RRN" given that this has created uncertainty and confusion in the past.
- clarifies that intervention pricing should not apply in circumstances where the reason for the intervention is to obtain a service that is not traded in the market (for example system strength, inertia, voltage control). This applies even if the provision of that service (e.g. system strength) results in the provision of energy or FCAS as a by-product of compliance with the intervention. This reflects the Commission's view that there is no economic rationale for applying intervention pricing in connection with interventions to obtain a non-market traded commodity because there is no relevant price signal to preserve. The use of intervention pricing in such circumstances can cause rather than reduce market distortion.
- clarifies the approach to be adopted when multiple intervention events coincide. The more preferable draft rule brings the wording of the test into line with the approach adopted by AEMO under its Intervention pricing methodology (an approach with which the Commission agrees) and clarifies which interventions should influence the intervention price and which should not.

The more preferable draft rule seeks to create transparency, predictability and consistency for the market, and remove as far as possible the need for AEMO to exercise discretion in determining how to apply the test. As noted in section 2.1, the consolidation of the original frameworks for security, reliability and statutory obligation directions was designed to reduce the level of discretion required to be exercised by NEMMCO as to whether a direction was a security, reliability or statutory obligation direction. Arguably, this objective has not been achieved since AEMO has instead been required to exercise discretion as to whether the RRN test is met. As evidenced by the examples discussed in section 2.3 and Appendix A, there is a range of views as to how the test should be applied and considerable areas of uncertainty.

The more preferable draft rule seeks to provide greater clarity to address the difficulties that have arisen in the application of the test to date. This is considered important for two reasons:

- the Commission considers that it would not be appropriate to extend the reach of the test to encompass the RERT while such uncertainties persist and,
- the Commission considers that recent application of the RRN test has resulted in inefficient market outcomes that are not consistent with the NEO. In particular, the use of intervention pricing in connection with South Australian system strength directions has resulted in higher than necessary wholesale energy prices and inefficient investment signals. This effect has been most pronounced in South Australia, with important implications for South Australian consumers, but the use of intervention pricing impacts prices across the NEM.

The Commission is concerned that intervention pricing in connection with system strength directions (and other security issues such as voltage control) is producing inaccurate price signals. Informed by these prices, new entrants may invest in additional capacity, regardless of whether those investments support or undermine system strength. This in turn may result in losses in dynamic efficiency.

In this way, efforts to reduce market distortion through intervention pricing have the unintended effect of producing inefficient investment signals as well as higher costs to consumers (due to the market clearing at the higher intervention price). Inaccurate investment signals may result in investment in energy capacity that does not support system strength at a systemic level.[35] This in turn can impose additional costs on consumers if further investments (e.g. network assets) are subsequently required to address declining levels of system strength. Such outcomes are not consistent with the NEO and the more preferable draft rule therefore seeks to remove them.

The Commission also notes that, notwithstanding changes made to the intervention pricing methodology in response to AEMO's review of intervention pricing, the complex method used to determine intervention prices can still lead to unexpected outcomes. For example, in early May 2019, intervention prices were for several hours strongly negative and lower than the prices produced by the "dispatch run" (the run of the NEM dispatch engine - NEMDE - which is used to determine dispatch targets but does not set the price at which the market clears). Such outcomes are not intended and highlight the difficulty of setting prices based on a counterfactual.

The Commission also notes that, as the counterfactual used to set intervention prices does not include the generators dispatched pursuant to the direction/s, it represents an insecure system that would not be allowed to be realised in practice. This is not considered a sound basis on which to set prices in such circumstances and compounds the Commission's concern about using intervention pricing in connection with directions for system security services which are not traded in the market.

The Commission has taken into account the views of stakeholders in response to the consultation paper. A slightly higher number of stakeholders (including AEMO) supported revising the current approach so that intervention pricing applies only in circumstances where

35 While the "do no harm" framework addresses the location specific impacts on the network of a new connecting generator, it does not address the wider impacts of such connections - in particular, the impact on the merit order and displacement of synchronous generators.

there is an economic rationale for doing so (an approach that necessitates changes to the RRN test).

The Commission recognises that removing intervention pricing in certain circumstances (e.g. South Australian system strength directions) may result in AEMO needing to issue more directions to gas fired generators. However, the extent to which this proves necessary will be a function of the degree to which the market "self corrects" when prices fall in the wake of a system strength direction bringing additional generation capacity online. This was a point stressed by stakeholders in responding to the Commission's analysis of wholesale energy price impacts. Stakeholders noted that prices would not be expected fall to the low levels seen in the "dispatch run" of NEMDE since generators will rebid rather than pay to generate if prices fall to strongly negative levels. Even if it proves necessary for AEMO to issue additional directions, the Commission considers this outcome to be preferable to the current situation wherein the entire NEM clears at a higher energy price in circumstances where energy is not scarce (only fault current is lacking).

Further detail on the more preferable draft rule can be found in chapter 5.

5 ISSUES RAISED AND COMMISSION'S CONCLUSIONS

This chapter outlines:

- the appropriate role for intervention pricing,
- issues to consider in revising the RRN test, and
- how the RRN test should be worded so its application aligns with its objectives.

The Commission notes that the scope of AEMO's rule change request is not limited to extending the RRN test to encompass the RERT. Even if it were limited in this way, it would still be important for the Commission to consider whether, before extending its application, the current RRN test is fit for purpose and achieving its objective of preserving scarcity price signals (when appropriate) in order to minimise the market distortion created by intervention events. This is discussed further below in section 5.1.

AEMO's proposal to change the wording of the RRN test requires the Commission to consider whether the proposed amendments should be incorporated in any revised rule. Issues associated with the AEMO proposal are discussed in section 5.2 while the Commission's conclusions regarding how the RRN test should be revised are set out in section 5.3.

5.1 The appropriate role for intervention pricing

The consultation paper examined how the RRN test and thus intervention pricing have been applied to date and what impact this has had on the market. It outlined the work undertaken by AEMO as part of its review of intervention pricing and the views of the Intervention Pricing Working Group (IPWG) established by AEMO to assist with that review.

Analysis undertaken by the Commission and set out in the consultation paper highlighted that the application of the RRN test and the resulting use of intervention pricing in connection with South Australian system strength directions has had significant impacts on the market, a point reiterated in submissions by stakeholders such as Snowy Hydro. In particular, the use of intervention pricing resulted in higher wholesale energy prices, particularly in South Australia, for a significant proportion of the 2018 calendar year (because directions were in place for 30 per cent of the time on average during 2018).

As discussed in the Final report of the investigation into intervention mechanisms, the Commission is concerned that this sends inaccurate signals to the market about the value of energy. In particular, implementing intervention pricing prevents the price of energy falling in the wake of a system security direction and masks the actual value of energy in a system that has plenty of MW but insufficient fault levels/system strength (or other security services such as inertia or voltage control). This approach does nothing to signal the need for system strength, nor could it given that there is no spot market for system strength. This is the service which the market is currently lacking and in response to which directions continue to be issued. The use of intervention pricing risks inducing investment in additional generation capacity that does not help address the low level of system strength in the region.

Accordingly, the consultation paper asked: "Is there merit in making more fundamental changes to intervention pricing? For example, should intervention pricing only apply in circumstances where there is scarcity of a market traded commodity? If not, what is the economic rationale for applying intervention pricing?"

5.1.1 AEMO's view

In its submission to the consultation paper, AEMO states its belief that "it is inefficient to apply intervention pricing during directions whose purpose is to address scarcity of non-market traded services".[36] While intervention pricing is appropriate for supply scarcity directions, AEMO notes that NEM spot prices cannot signal the scarcity of services, such as system strength, that are not market-traded. Therefore, AEMO does not believe it is efficient to preserve the energy or FCAS prices which would have occurred had the system strength direction not been issued. It notes that intervention pricing does not induce the provision of system strength.[37]

This represents an evolution of the view expressed in AEMO's December 2018 position paper that intervention pricing would continue to be implemented in connection with directions for system strength and voltage control if the RRN test is passed.[38]

AEMO's submission to the consultation paper notes that intervention pricing during system strength directions may worsen the situation by inducing additional investment in generation capacity which does not aid system strength. Instead, AEMO considers "it is preferable that the energy price reflect the level of scarcity of energy on an operational timeframe".[39] The Commission notes that, in practice, this means allowing the spot price to fall and then self-correct when system strength directions cause additional energy to be injected into the South Australian market.

5.1.2 Stakeholder views on intervention pricing

Most submissions noted the importance of reducing the frequency of directions and thus the application of intervention pricing. The Commission shares stakeholders' concerns in this regard and notes that a separate report on system strength issues will be published later in 2019. This report will consider potential changes to regulatory frameworks that could help minimise the degree to which AEMO intervention is required in order to maintain system security.

Of the 13 stakeholders who provided comment on intervention pricing:

- five stakeholders supported retaining intervention pricing in its current form (Engie, Powershop, AGL, ERM, EnergyAustralia),

36 AEMO, Submission to consultation paper, p. 5.
37 ibid, p. 6.
38 AEMO, *Intervention pricing for system security directions - position paper*, December 2018.
39 AEMO, Submission to consultation paper, p. 6.

- six stakeholders supported applying intervention pricing only when there is an economic rationale for doing so - that is, where the intervention is to obtain a service that is traded in the market (AEMO, TasNetworks, Powerlink, Origin, PIAC and Uniting Communities),
- two stakeholders (Snowy Hydro and AEC) stressed the distortionary impact of intervention pricing but did not express a clear preference for retaining or limiting the use of intervention pricing.[40]

The stakeholders who supported retaining intervention pricing "as is" considered it important to remove market distortion and preserve price signals in cases where intervention results in changes in the level of energy or FCAS provided in the market (regardless of the cause of the intervention). These views are similar to those expressed by the IPWG.

Snowy Hydro states that "interventions should only be used as a last resort, (and) when used they must minimise the distortionary effects to the primary NEM spot and contract markets... Intervention can compromise the current market design and its pricing signals affecting wholesale electricity prices and market signals to investors, and the energy and compensation costs faced by consumers."[41]

TasNetworks submits that intervention pricing should only be used when there is a scarcity of traded services (i.e. energy and FCAS) but not for system strength or other system security services for which there is no readily observable price. It considers that modifying the energy price will not appropriately and efficiently signal scarcity of system strength and inertia, and that intervention pricing is imposing costs on consumers and stifling investment signals that would address the issue longer term (as new generation is incentivised to connect regardless of whether doing so will help or hinder system strength).[42]

This view is shared by Powerlink, PIAC, Uniting Communities and AEMO.

Origin expresses a similar view, suggesting that the AEMC should assess the merits of applying intervention pricing during system security interventions where there is no shortfall of a traded commodity such as to warrant preserving market price signals. It also expresses concern that generators which do not contribute to system strength receive additional revenue during system strength directions due to the application of intervention pricing.[43]

Table 5.1: Stakeholder views on intervention pricing

APPROACH	STAKEHOLDERS
Retain intervention pricing as is	Engie, Powershop, AGL, ERM, EA (5)
Limit intervention pricing to instances where there is scarcity of a market-traded commodity	AEMO, TasNetworks, Powerlink, Origin, PIAC, Uniting Communities (6)

Source: AEMC analysis

40 Submissions to the consultation paper are available at https://www.aemc.gov.au/market-reviews-advice/investigation-intervention-mechanisms-and-system-strength-nem

41 Snowy Hydro, submission to consultation paper, p. 1.

42 TasNetworks, submission to consultation paper, p. 4.

43 Origin, submission to consultation paper, p. 2.

5.1.3 Stakeholder views on the regional reference node test

The consultation paper explored two issues relating to the RRN test. First, whether – as AEMO proposed in its rule change request – the test should be extended so that it encompasses the RERT in addition to directions. Secondly, whether the test should be amended so as to limit the circumstances in which intervention pricing should apply.

A number of stakeholders supported the proposal to extend the test to encompass the RERT but made no comment as to whether the test should be amended in the manner proposed by the AEMC (AEC, Powershop, ERM, EnergyAustralia). Others supported the AEMC proposal to change the test in order to narrow the circumstances in which intervention pricing should apply (TasNetworks, Powerlink, Uniting Communities).

As noted above, AEMO supports narrowing the application of intervention pricing to those instances where there is scarcity of a market-traded commodity (an approach that is consistent with the AEMC proposal to change the RRN test).

Table 5.2: **Stakeholder views on the regional reference node test**

APPROACH	STAKEHOLDERS
Extend test to apply to the RERT	AEC, Powershop, ERM, EA, Origin (5)
Revise text to focus on market-traded commodity	TasNetworks, Powerlink, Uniting Communities (3)

Source: AEMC analysis

5.1.4 Analysis and conclusions

As discussed in chapter 3 of the Final report of the Investigation into intervention mechanisms in the NEM, the Commission considers that the use of intervention pricing should be limited to those situations where there is scarcity of a market-traded commodity (at present, energy and FCAS). Where the required service is not market-traded, there is no relevant price signal to preserve and thus no economic rationale for applying intervention pricing. In such cases, the use of intervention pricing can distort price signals. This is contrary to the objective of intervention pricing, being to reduce market distortion arising from intervention events.

The directions issued in South Australia do not respond to a scarcity of energy or FCAS (in which case there would be a clear rationale for implementing intervention pricing). Rather, the SA directions respond to inadequate system strength - a service which, like inertia, is not traded in the market. As described in AEMO's South Australian Electricity report, they are directions for the provision of fault current, not for energy.[44]

Intervention pricing was implemented for around one third of hours in 2018, in stark contrast to the use of intervention pricing for reliability directions (of which there have been only two

44 AEMO, *South Australian Electricity Report*, 2018, p. 53; emphasis added.

since 2010). During those two events, intervention pricing was used for a total of 4 hours and 5 minutes.[45]

Informed by these sustained higher prices, new entrants may invest in additional capacity, regardless of whether those investments support or undermine system strength.[46] This in turn may result in losses in dynamic efficiency. In this way, efforts to reduce directions-related price impacts on existing generators through intervention pricing can produce inefficient investment signals as well as higher costs to consumers (due to the market clearing at the higher intervention price).

This concern has also been recognised by AEMO which noted in its December 2018 position paper on intervention pricing that:[47]

> There is a broader concern as whether intervention pricing applied in situations where there is no shortage of general generation available (energy or FCAS), distorts price signals seen by potential investors. It is arguable that this goes against what intervention pricing is intended to achieve - that is, avoiding market distortions.

The IPWG was of the view that, when a direction results in a perturbation of the supply demand balance, it is appropriate to apply intervention pricing to preserve the price of energy, even though there is no scarcity of energy. (This view was again expressed by a number of stakeholders in submissions to the consultation paper.) On the other hand, the view of SW Advisory and Endgame Economics was that, if there is no scarcity of a market traded commodity, the use of intervention pricing to preserve signals to the market is not justified.

Indeed, SW Advisory and Endgame Economics considered that the use of intervention pricing in such cases can have the opposite effect to what is intended: it can cause market distortion rather than minimising it, particularly when interventions are in place for a significant proportion of the time. This is because intervention pricing serves to conflate two services - one being generic MW, and one being system strength (in the case of the South Australian system strength directions). By not allowing the spot price to fall when a system strength direction brings additional capacity online, intervention pricing has the effect of holding the price of energy at levels which do not reflect the actual scale and mix of generators providing energy to South Australia.

The consultants' report states:[48]

> In our opinion, there is no economic rationale for altering prices for energy and ancillary service prices during an intervention that occurs to obtain these 'unpriced services'. No amount of modification of the energy price will signal the scarcity of the

45 AEMO, *NEM Event – Direction to South Australia Generator – 9 February 2017*, July 2017, p. 12 and AEMO, *NEM Event – Direction to South Australia Generator – 1 March 2017*, January 2018, p. 10.

46 While the "do no harm" framework addresses the location specific impacts on the network of a new connecting generator, it does not address the wider impacts of such connections – in particular, the impact on the merit order and displacement of synchronous generators.

47 AEMO, *Intervention pricing for system security directions - position paper for the NEM*, December 2018, p. 4.

48 SW Advisory, op cit, pp. 28-29.

> unpriced services. AEMO should not therefore use intervention pricing in these cases... There is no economic rationale for intervention pricing being applied to energy and FCAS prices - these services were not scarce and so there is no need to confect a price to signal their scarcity.

The Commission shares this view. While it acknowledges that directions for system strength perturb the supply demand balance in South Australia, it does not consider this to be a sound basis on which to implement intervention pricing.

Preserving a price signal for energy that does not distinguish between generators which help maintain system strength and those which do not means that market prices are not signalling the services that the system actually needs. Instead, the price for energy creates conditions that are favourable for new entrants, regardless of whether they improve or worsen the situation with respect to system strength. New entrants investing on the back of such prices may exacerbate the existing system strength problem, leading to inefficient outcomes.

While concern about investment signals may not be warranted if intervention pricing was only used for a small proportion of the time, the use of intervention pricing for around one third of dispatch intervals in 2018 means that the impact on average spot prices is significant. This distortionary effect is recognised in ElectraNet's February 2019 economic evaluation report which states: "both AEMO and ElectraNet recognise that ongoing use of generator directions beyond the short-term is not a sustainable outcome and leads to distortions in the market, significant costs to consumers and operating difficulties".[49] The impact on contract prices and investment signals was also recognised by Snowy Hydro in its submission to the consultation paper.

Continuing to apply intervention pricing in connection with system strength directions will not deliver the security that the system needs, and may prompt the need for other more costly measures and investments to address resulting system insecurity.

The Commission also notes that, in the case of system security directions such as those being issued in South Australia, intervention prices are a function of a hypothetical generation mix that would never be allowed to be realised in practice. This is because the intervention pricing run does not include dispatch targets for those generators which have been directed to provide services, thus making the system secure. AEMO would not allow the system to operate in a state that is insecure as a result of inadequate system strength - as evidenced by the fact that AEMO intervenes in the market by issuing directions when system strength is inadequate.[50] Given this, the Commission does not consider it appropriate to set prices in connection with system security directions based on a counterfactual that is insecure and therefore implausible. In such cases, the intervention price is abstracted to a point that does not reflect AEMO's key obligation to operate the system in a secure state.

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49 ElectraNet, *Addressing the system strength gap in SA*, February 2019, p. 18.

50 The situation would be different in the context of a reliability direction: AEMO may allow the system to fall short of the reliability standard so long as it is not insecure.

The Commission considers it important to mitigate, where possible, dynamic efficiency losses that could accrue if distorted price signals lead to inefficient investment outcomes. It is also vitally important, consistent with the NEO, to mitigate the impact on consumers of higher wholesale electricity prices - as noted in submissions by Snowy Hydro, AEMO, TasNetworks, PIAC and Uniting Communities.

As flagged by ERM Power and Origin in their submissions, the Commission also notes that customers are experiencing higher costs while generator portfolios that include both gas-fired and wind generators are receiving the twin benefits of directed participant compensation and higher prices resulting from the use of intervention pricing (even where the recipients of that higher intervention price do not contribute to system strength or the cost of compensating directed participants). This compounds concern about the inefficiency of the current arrangements and the costs imposed on consumers.

The Commission also notes that, notwithstanding the changes made by AEMO to its intervention pricing methodology, issues with the application of intervention pricing remain - as illustrated by the price outcomes observed on 1 May 2019. Reducing the risk of such unintended outcomes is an additional benefit of limiting the use of intervention pricing in circumstances where there is no economic rationale for applying it.

For these reasons, the Commission considers it appropriate to limit the use of intervention pricing to those circumstances where there is a relevant market price signal to preserve: that is, where there is scarcity of a market traded commodity. As with the current RRN test, the Commission considers it appropriate that, where a relevant scarcity (being scarcity of a market traded commodity) is localised and not region-wide, intervention pricing should not apply save for those instances where the relevant localised scarcity coincides with the regional reference node. This issue is discussed further below in section 5.3.

While the focus of the consultation paper was on directions issued in response to inadequate system strength, the same rationale applies where directions are issued for other system security services such as voltage control and inertia. The Commission considers that it is not appropriate to implement intervention pricing in connection with interventions to obtain services that are not traded in the market since, in such instances, there is no relevant market signal to preserve. Implementing intervention pricing in such instances can be expected to cause rather than reduce market distortion.

What are the implications of "turning off" intervention pricing for system strength directions?

In reaching this conclusion, the Commission has had regard for the consequences of changing the RRN test such that intervention pricing no longer applies in circumstances where the purpose of the intervention is to obtain a service that is not a market traded commodity.

The Commission recognises that "turning off" intervention pricing may result in the spot price falling in South Australia during system strength directions such that AEMO needs to issue more directions to gas fired generators.[51] However, the Commission notes that the extent to

51 This point was raised by EnergyAustralia in its submission to the consultation paper, p. 2.

which this is the case will depend on the degree to which the market self corrects when the spot price falls in response to a direction being issued, and the role of the contract market.[52]

The ability of the market to "self correct" was stressed by stakeholders in response to the consultation paper's analysis of the impact of intervention pricing on wholesale electricity prices. For example, the estimated impact of intervention pricing on wholesale prices was described as an "absolute upper limit" since the market could be expected to self correct in the event intervention pricing was not implemented (and the spot price was allowed to fall in response to directed generation coming online).[53]

Consistent with this view, it is not clear to what extent AEMO will need to issue additional directions to gas fired generators to maintain adequate system strength. If, as noted by stakeholders, the market self corrects when intervention pricing is removed, then AEMO may not need to issue additional directions, or may only need to issue a limited number of additional directions.

In any event, the Commission considers that the potential disbenefit of AEMO having to direct more generators for system strength is more than offset by the benefit of sending efficient rather than distorted signals to the market. Any additional costs involved in compensating directed generators should be more than offset by the benefit of the entire NEM clearing at a lower wholesale price. (As discussed in chapter 4 of the Final report on the investigation into intervention mechanisms, changing the basis on which directed participants are compensated could mitigate the potential impact of AEMO having to direct more gas fired generators for system strength once intervention pricing is "turned off".)

In considering the impact of "turning off" intervention pricing, the Commission also notes that full implementation of the minimum system strength framework will in the near term significantly reduce if not entirely remove the need for AEMO to issue directions to generators to maintain system strength. As such, and all else equal, the system strength framework will significantly reduce or remove the wider impacts on wholesale prices that result from the use of directions and intervention pricing.[54] Accordingly, it is important to keep in perspective any potential concern that removing intervention pricing will result in lower prices, making investment less attractive and thus causing reliability concerns.

In other words, removing the effect of intervention pricing due to system strength directions in South Australia is a question of "when" not "whether". Changing the RRN test and "turning off" intervention pricing in connection with system strength directions simply brings forward the point in time at which the impact of intervention pricing would in any event have been removed (or greatly reduced). Any short term impacts of the proposed new RRN test (e.g.

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52 The consultation paper acknowledged that high spot prices do not immediately and directly translate into higher prices as most retailers have hedge contracts with generators to manage wholesale price volatility. In the same way that the contract market can mitigate the impact of intervention pricing on consumers, the contract market can also be expected to soften the impact on generators of removing intervention pricing.

53 EnergyAustralia, Submission to consultation paper, p. 2.

54 Had ElectraNet contracted with generators for the provision of system strength services, intervention pricing would not have been implemented when those generators were called on by AEMO to provide system strength services. Once ElectraNet commissions its synchronous condensers in 2020, the spot price can be expected to fall when wind output is high and demand is low to moderate as AEMO will no longer need to issue system strength directions and implement intervention pricing in connection with those directions. The cost of the synchronous condensers (or generator contracts, had that option been pursued) will be passed through to consumers via TNSP charges, not the spot price.

falling prices prompting AEMO to issue more directions) are considered acceptable given the importance of reducing market distortion, sending accurate signals to participants and investors, and reducing upward pressure on wholesale energy prices.

5.2 Issues to consider in developing a revised RRN test

As noted in the consultation paper, the Commission considers that AEMO's proposal to amend the wording of the RRN test changes the current meaning of the test (contrary to AEMO's stated intent not to alter the meaning or application of the test) and that the proposed wording introduces a potentially distortionary element. This and other issues are discussed below.

5.2.1 Should the RRN test reference a subset of potential interventions?

Currently, the RRN test does not specify what kind of direction given to a registered participant in respect of plant at the RRN would have avoided the need for the intervention. By contrast, the AEMO proposal asks whether the need for the intervention event could have been avoided by a "direction to provide energy or market ancillary services at the regional reference node".

This wording may be appropriate when considering the example discussed in Appendix A, section A.4 regarding the directions issued to Mt Stuart in northern Queensland. In that case, a direction to provide energy at the RRN would not have avoided the need to direct a generator in northern Queensland (on the other side of a forecast network constraint resulting from the impact of Cyclone Debbie). However, the application of the proposed wording to other situations, particularly directions for system security, is less straight forward. In the case of system strength, for example, would a direction to provide "energy" at the RRN avoid the need for a direction to provide system strength?

This raises a host of questions about what "energy" constitutes. Energy is defined in Chapter 10 of the NER as "active energy and/or reactive energy". Active energy is in turn defined as "a measure of electrical energy flow, being the time integral of the product of voltage and the in-phase component of current flow across a connection point, expressed in watt-hour (Wh)". Reactive energy is defined as "a measure, in var-hour (varh), of the alternating exchange of stored energy in inductors and capacitors, which is the time-integral of the product of voltage and the out-of-phase component of current flow across a connection point".

This definition of energy does not distinguish between energy produced by different types of generators - for example, synchronous, asynchronous, large, small, slow start or fast start. Directing for "energy" per se (i.e. generic MW) will not necessarily solve for inadequate system strength. Aside from synchronous condensers, what is typically required to address inadequate system strength is a generator or combination of generators which are synchronous, large, and electrically close to the area where fault levels need to be maintained.[55]

55 Battery energy storage technologies with certain power conversion systems can produce substantial fault current and could in future play a greater role in maintaining adequate system strength.

While directing for "energy" in the past may have delivered system security as an inherent by-product of the provision of electricity, this is no longer the case. The rapid evolution of the generation sector suggests it is not appropriate to incorporate in the test a generic term such as "energy" when the system security services that are required can only be provided by a subset of energy generators.

This is reflected in the AEMO event reports which describe the use of directions to maintain system strength in South Australia. Each of those reports commences with the following statement: "To ensure adequate system strength for secure operation of the South Australia power system, certain combinations of synchronous generating units must be in service at all time."[56] This reflects that generic MW will not suffice to deliver adequate system strength. Indeed, system strength directions are issued when the South Australian system has plenty of energy but not enough system strength.

Adopting the language proposed in the AEMO rule change request could create uncertainty given the broad nature of the term "energy" and the variety of energy generators in the current NEM (some of which will be able to provide required system security services and others of which will not). The contrast between using a generic term such as "energy" and the specific nature of the services required in South Australia is evident in the South Australian Electricity Report's reference to South Australian system strength directions being directions for *fault current* rather than directions for *energy*.[57]

As noted earlier, the Commission is concerned that the amendment proposed by AEMO in its rule change request may create confusion (e.g. is the direction for energy or fault levels?) and the potential for distortionary pricing impacts (by conflating energy with the provision of specific system security services). To avoid the potential for such distortionary effects, and confusion about whether relevant services are provided "at the node", the Commission has determined to make a more preferable rule that does not adopt the wording proposed by AEMO in its rule change request.

5.2.2 Providing services "at the RRN"

AEMO's rule change request describes the current RRN test as recognising "that the scarcity price signal at the RRN serves no purpose where action at the RRN could not have prevented the direction. Put another way, scarcity price signals are not appropriate where a direction is issued for plant at a specific location on the network to resolve a localised condition".[58] What constitutes "action at the RRN" has been a cause of uncertainty in the application of the test.

AEMO's proposed amendment to clause 3.9.3(d) retains the reference to services being provided "at the RRN". Under this proposed wording, uncertainty could be expected to remain as to what the provision of services "at the RRN" means. Does this mean services are provided at or close to the node, by either a real or notional plant? Would it suffice if services were provided by an actual plant which is located far from the node but in circumstances

56 See for example AEMO, *NEM Event - Direction 27-28 March 2018*, June 2018, p. 4.
57 AEMO, *South Australian Electricity Report*, November 2018, p. 53.
58 AEMO, *Electricity Rule Change Proposal*, p. 3.

where there is no network constraint between the plant and the node (meaning it is electrically if not geographically located "at" the RRN)?

While AEMO states in its rule change request that the RRN test "does not require the existence of a real physical unit to be directed and that the test can be applied to a notional unit at the regional reference node", it nonetheless relies, in the South Australian context, on the fact that one of the acceptable system strength combinations involves directing the Torrens Island power station only (not in concert with other power stations). The rule change request states that "system strength directions in South Australia require one of a number of combinations of units to be directed. One of these combinations involved only units at Torrens Island Power Station, which is located at the regional reference node. Thus the test is passed for all combinations and intervention pricing is required."[59]

To address these issues, the Commission has developed a more preferable draft rule which does not adopt the wording proposed by AEMO in its rule change request. Instead the more preferable draft rule provides that intervention pricing should not apply when a constraint is in effect and an intervention is used to obtain a service in a part of the region which, due to the constraint, does not contain the RRN (see further discussion in section 5.3).

5.2.3 Avoiding the need for any direction that constitutes the intervention event

The current RRN test provides that AEMO must continue to set prices normally (and not implement intervention pricing) in the event that a direction given to a registered participant in respect of plant at the RRN would not, in AEMO's reasonable opinion, "have avoided the need for any direction which constitutes the AEMO intervention event to be issued".[60]

This reference to "any direction" was inserted in the provision in 2008 (replacing the words "the direction"). This change was designed to make clear that an intervention event could comprise multiple directions.[61] At face value, the provision as revised in 2008 appears to signal that, if any single direction does not meet the RRN test, intervention pricing is not to apply.

AEMO's proposed amendments to the RRN test remove the current reference to "any direction". While clause 1.7.1(b) of the NER provides that "words importing the singular include the plural and vice versa",[62] the proposed amendment to the test may introduce further uncertainty as to how the test should be applied in instances where an intervention event comprises multiple directions and/or RERT activation.

This element of the RRN test has generated confusion as to how it should be applied. For example, consistent with the interpretation noted above, the AEMO rule change request

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59 AEMO, *Electricity Rule Change Proposal*, p. 4. Of the 51 generator unit combinations that AEMO has found to deliver adequate system strength in SA, only two combinations involve Torrens Island power station units only. All other combinations involve units from multiple power stations: AEMO, *Transfer Limit Advice - South Australia System Strength,* December 2018.

60 NER, clause 3.9.3(d).

61 See National Electricity Amendment (NEM Reliability Settings: Information Safety Net and Directions) Rule 2008 No. 6, available at https://www.aemc.gov.au/sites/default/files/content/47a35cb6-8217-4c0d-8759-a06c248458e7/Mark-up-of-Final-Rule-in-version-20-of-the-National-Electricity-Rules.pdf

62 This interpretation clause existed at the time the above amendment was made. Despite this, the decision taken in 2008 reflects that there was still seen to be value in clarifying the application of the RRN test in instances involving multiple directions.

states that "the RRN test is only met if all directions that relate to an AEMO intervention event could have been substituted by a direction at the regional reference node".[63] Similarly, AEMO's December 2018 Position paper states: "The RRN test indicates that a direction at the RRN must be able to avoid the need for any direction that constitutes the AEMO intervention event. Where an intervention event comprises multiple directions (to meet the same need), AEMO considers the RRN test is only met if all those directions could have been avoided."[64]

By contrast, AEMO's submission to the consultation paper states: "AEMO intends for the RRN test to be applied separately to each AEMO intervention event, even where multiple interventions are effective simultaneously".[65] It provides the example set out below to illustrate how AEMO currently applies the RRN test for periods when multiple directions are in effect:[66]

> Suppose that two directions are effective at the same time. However, only one direction passes the RRN test. To implement the directions, two constraints would be invoked, for example specifying the minimum loading of two generators. The constraint relating to the direction which passes the RRN test would have an intervention flag attached to it, whereas the other constraint would not. The constraint with an intervention flag would then be removed from NEMDE's intervention pricing run. In this way, intervention pricing ignores the direction which passes the RRN test and hence intervention pricing in the NEM would cease whenever this direction ends. AEMO notes this interpretation reflects current processes and AEMO's proposed wording of the RRN test was intended to support the continuation of these processes.

The Commission accepts that the above approach is sensible and consistent with the underlying objective of intervention pricing, being to preserve market scarcity signals where there are relevant price signals to preserve.

To avoid further confusion about this part of the RRN test, the more preferable draft rule includes a new paragraph in clause 3.9.3(b)(4) that clearly describes the approach to be adopted when multiple intervention events coincide. This is set out below for ease of reference:[67]

> In respect of any *intervention price dispatch interval* in which more than one *AEMO intervention event* occurs, *AEMO* must in accordance with the methodology or assumptions *published* pursuant to paragraph (e) set *dispatch prices* and *ancillary service prices* pursuant to subparagraph (1) as if:
>
> 1. the services described in subparagraphs (1) and (2) were not provided; and
> 2. taking into account any *energy* or *market ancillary services* provided as a by-

63 AEMO, *Electricity Rule Change Proposal,* p. 4.

64 AEMO, *Intervention pricing for system security directions - position paper*, December 2018, p. 4.

65 AEMO, *Electricity Rule Change Proposal*, p. 6.

66 ibid, p. 7.

67 AEMC, *Draft National Electricity Amendment (Application of the regional reference node test to the Reliability and Emergency Reserve Trade) Rule 2019*, clause 3.9.3(b)(4).

product of the provision of any services described in subparagraph (3)(ii).

In accordance with the Intervention pricing methodology established by AEMO under clause 3.9.3(e) of the NER, intervention pricing works by setting the dispatch price and ancillary service prices as if the AEMO intervention event had not occurred, provided the RRN test is met. Under the more preferable draft rule, this will continue to occur where the services provided pursuant to the intervention are market traded commodities (energy or FCAS) or a direct substitute for those services (an issue that is discussed further below). These are the services dealt with in clause 3.9.3(b) subparagraph (1) of the more preferable draft rule. Subparagraph (2) deals in more detail with those situations where energy or FCAS are provided in a particular part of a network (discussed further below).

Under the AEMO Intervention pricing methodology, where multiple intervention events coincide, dispatch and ancillary services prices are set by ignoring the services provided due to the AEMO intervention event if they are services which pass the RRN test. This preserves prices at the levels that AEMO considers would have occurred but for the intervention. However, if the services provided pursuant to the intervention do not pass the RRN test, then any energy or ancillary services provided in the course of complying with the intervention are taken into account in setting dispatch and ancillary service prices.

For example, under the approach set out in the more preferable draft rule, if AEMO issues a direction to a generator in South Australia to provide system strength, the energy produced by that generator as a by-product of compliance with the direction to provide system strength will be taken into account in setting the price at which the market clears during the intervention event. (This will generally lower the spot price, reflecting the resulting change in the supply demand balance.) If, at the same time, AEMO issues another direction to provide services which are traded in the market, then the energy or FCAS provided by that directed generator will *not* be taken into account in setting the intervention price. Again, this reflects that intervention pricing is designed to set the energy and FCAS price at the level which, in AEMO's reasonable opinion, would have occurred had the intervention not taken place.

5.2.4 Unintended consequences

AEMO's proposed amendment to clause 3.9.3(d) effectively asks whether the need for the AEMO intervention event (comprising both RERT and directions) could have been avoided by a direction to provide energy or FCAS at the RRN. This means that, in the case of intervention events involving the RERT, the test is whether the RERT activation could have been avoided by a direction to provide energy or market ancillary services.

In the case of a reliability event necessitating the activation of the RERT, it is reasonably likely that no in-market generators will be available to direct – hence the need to activate out of market reserves via the RERT. In such a case, under the wording proposed by AEMO, it is arguable that the RRN test would not be met and intervention pricing would not apply.

This is not the intention of the proposed rule change request (which is designed to ensure that intervention pricing does not apply when the event relates to a localised issue, but is not designed to change the current application of intervention pricing during "reliability" events).

The Commission's decision to develop a more preferable draft rule resolves this issue.

5.3 How should the RRN test be worded?

5.3.1 AEMO's view

As noted above, AEMO's suggested approach to the RRN test was set out in its rule change request. AEMO's approach to the RRN test was further clarified in its submission to the consultation paper and subsequent discussions with Commission staff.

5.3.2 Stakeholder views

Stakeholders expressed general views regarding the RRN test and intervention pricing but did not go into detail regarding the wording of the test as proposed by AEMO in its rule change request.

5.3.3 Analysis

The question of when it is appropriate to apply intervention pricing does not lend itself to a clear cut test. For example, it is not possible to adopt a test stating that intervention pricing should apply in connection with reliability directions but not security directions, for region-wide issues but not localised issues, or even for interventions to obtain market-traded services but not for interventions to obtain a service which is not a market-traded commodity.

Reliability v security directions

When the NEM commenced operation in 1998, the National Electricity Code distinguished between reliability and security directions. Intervention pricing was implemented in connection with reliability directions but not for security directions. A review undertaken in 2000 by NECA and NEMMCO concluded that the separate arrangements for reliability and security directions should be consolidated into a single common arrangement so as to reduce the amount of discretion required to be exercised by NEMMCO in determining which category of direction was being issued.

Reverting to the previous approach (that is, drawing a distinction between reliability and security directions) is not considered appropriate given that - in October 2001 - new provisions were added to the National Electricity Code to create a market for frequency control ancillary services (FCAS). These services, which are market traded commodities, relate to the security of the system. Thus, there is no longer a clear cut distinction between reliability directions (which relate to scarcity of a market traded commodity - energy) and security directions (which relate to keeping the system operating within defined technical limits - including through the provision of market traded FCAS). In the event that AEMO needs to intervene in the market for the purpose of obtaining FCAS to keep the system secure, it is appropriate to implement intervention pricing to preserve market scarcity signals.

Finally, the Commission notes that it is difficult in practice to distinguish between a reliability and a security direction and that a reliability event can morph quickly into a security event and vice versa. As such, reverting to the approach that applied prior to the 2000 review would again require AEMO to exercise discretion in determining the category of intervention

being used. This would not create certainty and predictability for the market and thus would not address the challenges that have arisen in applying the RRN test.

Market traded v non-market traded commodities

The consultation paper considered whether the RRN test could simply focus on whether the intervention is to obtain a service that is traded in the market. In cases where the service is not traded in the market (e.g. system strength, voltage control or NSCAS), intervention pricing would not apply. Such an approach would be consistent with the economic rationale for intervention pricing and ensure that intervention pricing does not apply when, as AEMO says, "there is no value in a scarcity price signal at the RRN" - for example, because there is no relevant market price signal to preserve.

The paper noted that such an approach would ensure that intervention pricing is only applied where there is an economic rationale for it, thereby mitigating the potential for distortionary price signals and higher than necessary costs to consumers. In addition, this alternative approach would be somewhat "future proof" in the sense that, if new markets are created to value particular services (e.g. system strength), then intervention pricing could be applied to preserve the price of that service at the level that would have prevailed but for the direction or RERT activation.

This approach would require AEMO to form a view as to whether the service which is the subject of an intervention event is one that is traded in the market. This is not always clear cut, as evidenced by the independent expert reports prepared in the wake of directions issued to participants in South Australia and Victoria following the loss of the Heywood interconnector on 1 December 2016 (described in Appendix A). For example, the June 2017 report (prepared in response to a request from AEMO to determine the fair payment price for a service other than energy or FCAS) took the view that no compensation was payable to directed participants for the service of reducing output (and in one case being turned off). This was because "the NEM does not compensate generators that are constrained off, and there is no clear exception to this principle when the instruction to reduce output or shut down results from a direction rather than in the process of implementing central dispatch".[68]

However, following a further claim for compensation due to loss of revenue, Synergies revised this initial view (in respect of one claimant but not the other). In its later report, Synergies concluded that the directed participant (in responding to a direction to reduce output due to insufficient available FCAS) had provided a relevant service, described as being "a substitute for the provision of market ancillary services by normal means". As such, Synergies concluded that the participant was entitled to be compensated for loss of revenue under clause 3.15.7B.[69]

This illustrates that there can be a range of views as to what constitutes a service in the market, highlighting the need for clarity and predictability in the NER as to how the interventions framework is intended to operate. To address this, the more preferable draft rule provides that intervention pricing should apply if the reason for an intervention is to

68 Synergies, *Final report on compensation related to directions that occurred on 1 December 2016*, June 2017, p. 13.

69 Synergies, *Final report on additional compensation claims arising from AEMO directions on 1 December 2016*, August 2017, p. 13.

obtain a service that is a direct substitute for a service for which a dispatch price or ancillary service price is determined by the dispatch algorithm. Thus, in a situation comparable to that on 1 December 2016 when AEMO directed Pelican Point to reduce output due to a lack of available FCAS, this would - under the more preferable draft rule - trigger the use of intervention pricing to signal the scarcity of FCAS.

The more preferable draft rule also refers in clause 3.9.3(b)(2)(v) to demand response as an example of a service which, if it is obtained pursuant to an intervention, triggers the implementation of intervention pricing. This is not referring to *wholesale demand response* as set out in the AEMC's Draft determination on the Wholesale demand response mechanism.[70] That draft determination proposes to amend the definition of "directed participant" in chapter 10 of the NER so that AEMO will have the power to direct demand response service providers in respect of their ancillary service loads (e.g. an industrial customer with the capacity to reduce consumption).The Commission is seeking feedback on this draft determination by September 2019. If the wholesale demand response mechanism comes into effect, it will be caught by the reference in clause 3.9.3(b)(1)(i) to services for which a dispatch price is determined by the dispatch engine.

What is contemplated in this more preferable draft rule (relating to the regional reference node test) is the situation where AEMO directs a registered participant to reduce consumption. Under clause 4.8.9, AEMO can issue a direction to a registered participant to reduce consumption by scheduled loads.[71] This is distinct from the situation where AEMO issues an instruction (generally to a TNSP) to shed load.[72]

The system strength directions in South Australia provide another example of the confusion that can arise as to what service is being provided pursuant to a direction (and thus which part of the compensation framework is applicable). For system strength directions, AEMO calculates compensation for directed participants under clause 3.15.7 of the NER, a clause which relates to directions for energy and market ancillary services. Under clause 3.15.7, compensation is calculated based on the 90th percentile price for the preceding 12 months and the cost of compensation payments is recovered from market customers.

By contrast, ElectraNet's February 2019 economic evaluation report refers to system strength directions as being directions other than for energy and ancillary services. The report notes that the cost of compensation for such directions must be recovered from market customers, market generators and market small generation aggregators in proportion to the customer energy, generator energy and small generation aggregator energy respectively.[73]

To avoid such confusion, the more preferable draft rule sets out clearly the circumstances in which intervention pricing should and should not apply, rather than simply adopting the approach of asking whether the service being obtained is a market traded commodity.

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70 AEMC, Wholesale demand response mechanism, Draft rule determination, 18 July 2019.

71 Under clause 4.8.9(a1)(1), AEMO can issue a direction to a registered participant to take action in relation to *scheduled plant* or a *market generating unit*. *Scheduled plant* is defined to include (among other things) scheduled and semi-scheduled generators and scheduled loads.

72 Under clause 4.8.9(a1)(2), AEMO can issue an instruction to a registered participant to take 'some other action' - i.e. take action other than in relation to a scheduled plant or market generating unit.

73 ElectraNet, *Addressing the system strength gap in SA,* February 2019, p. 20.

This avoids a further area of potential confusion which arises in relation to directions to obtain a service (e.g. energy) which, generally speaking, is a market traded commodity but which, in the circumstances of the intervention, can be considered to be a commodity that is not traded in the market. An example of this is the direction issued in March 2017 to Mount Stuart power station. AEMO issued the direction in anticipation of the possible loss of the transmission link to north Queensland as a result of Cyclone Debbie.

As discussed in Appendix A.4, this direction (even though it was a direction to provide energy) can be considered a direction to obtain an unpriced service. The SW Advisory report noted that, even if the contingency in that case had occurred, the constrained-on generators would not have received the market price cap even if they were preventing load shedding (due to the operation of clause 3.9.7 of the NER). The report comments: "There is therefore no signal to the generators to provide the service - it is unpriced in the spot market. It follows that there is no case here for intervention pricing, of course noting that intervention pricing was not applied because of the RRN test. If the NEM had a spot market in locational (sub regional) FCAS or Network Support and Control Ancillary Services (NSCAS), this would be a case for intervention pricing. But the NEM does not have spot markets in either of these potential services.... Hence, NSCAS is an unpriced service in the spot market."[74]

This example again highlights the difficulty in adopting a clear cut test based on whether the service being obtained is a market traded commodity. It confirms that a different approach is needed to provide the required level of clarity.

Localised v region wide issues

Similarly, the Commission considers that it is not appropriate to amend the RRN test such that it draws a simple distinction between an intervention to address a region-wide issue (in which case intervention pricing would apply) and an intervention to address a localised issue (in which case intervention pricing would not apply). While such an approach is attractive in its simplicity, it does not accommodate the situation where a localised issue coincides with the RRN. In such a case, even where the issue is not region-wide in nature, there is still a case to apply intervention pricing because the RRN is typically located at or close to the major load centre in a region. Accordingly, it is appropriate to preserve scarcity signals through the use of intervention pricing when a localised shortage of a market traded commodity arises in a part of the network that contains the RRN.

Consistent with this, the more preferable draft rule provides that intervention pricing should apply where:

- the reason for the intervention is to obtain energy or FCAS that can be provided by any generating unit or ancillary service generating unit within a region (i.e. where the issue is region-wide), or
- where a network or other constraint is binding, and services are provided by a generating unit or ancillary service generating unit located in the part of the region that includes the RRN (i.e. where the issue is localised but coincides with the RRN).

74 SW Advisory and Endgame Economics, op cit, p. 24.

The more preferable draft rule also makes clear that prices should be set as normal (i.e. intervention pricing should not apply) where the reason for the intervention is to obtain energy or FCAS services which, due to a network or other constraint, can only be provided by a generating unit or ancillary service generating unit in a part of the region which due to the constraint does not include the RRN. (This was the situation that arose in the Mt Stuart example discussed above.) The wording included in the draft rule is considered preferable to the RRN test's current reference to services being provided "at the RRN" since it makes clear what is intended, rather than relying on AEMO and participants to determine what "at the RRN" means.

The Commission acknowledges that there may be instances where it is difficult in practice to determine whether a part of the region includes or does not include the RRN - particularly in cases where the relevant constraint is other than a transmission constraint. However, the Commission considers it is not possible to craft the test to accommodate all possible scenarios and has sought to provide as much clarity as possible through the examples provided.

5.3.4 Conclusions

To provide clarity regarding the circumstances when intervention pricing should apply, the more preferable draft rule adopts a significantly more detailed RRN test than proposed by AEMO. This is considered necessary to convey clearly the circumstances in which intervention pricing should and should not apply.

The test makes clear that intervention pricing is not to apply in circumstances where the service being obtained is not a service traded in the market (e.g. system strength, inertia, voltage control) and clarifies that, when the intervention is to obtain energy or FCAS, intervention pricing is not to apply when the issue arises in a part of the network which has effectively been separated from the RRN by a network or other constraint.

In this way, the more preferable draft rule seeks to provide greater certainty, predictability and consistency to the market and reduce the degree of discretion that must be exercised by AEMO in applying the test.

By removing intervention pricing in circumstances when there is no economic rationale for its use, the more preferable draft rule will reduce unwarranted costs to consumers and remove inaccurate signals to investors.

Figure 5.1 below sets out in summary form the circumstances in which intervention pricing will and will not apply under the more preferable draft rule.

Figure 5.1: What services will trigger intervention pricing under the more preferable draft rule

Service obtained under the intervention	Intervention pricing?
Service for which a dispatch price or ancillary service price is determined (i.e. energy or FCAS)	yes
A service that is a direct substitute for energy or FCAS (e.g. directing a generator to reduce output where insufficient FCAS is available)	yes
Energy or FCAS to address a localised deficiency that coincides with the RRN	yes
Energy or FCAS to address a localised deficiency in a part of the region that does not include the RRN due to a network or other constraint	no
Service for which a dispatch price or ancillary service price is not determined: for example, inertia, voltage control, system strength, non-market ancillary services (i.e. NSCAS and SRAS)	no

Source: AEMC

5.4 How would the new RRN test apply in practice?

The table below compares three different versions of the RRN test. The first column shows the results that follow from the application of the RRN test in its current form. The second shows how the test would work if it is drafted in the form proposed by AEMO, while the third shows how the Commission envisages the more preferable draft rule would work.

The examples used reflect the intervention events discussed in section 5.3 and Appendix A. Ticks are used to indicate that intervention pricing did apply, or would apply, while crosses indicate that intervention pricing did not or would not apply.

Figure 5.2: How the proposed new RRN test would work in practice

Date of event	Nature of intervention	Current RRN test	AEMO proposal	More pref. draft rule	Notes
13 Oct 2015	Security event – transmission outage in northern Qld	x	x	X	
1 Dec 2016	Security event due to loss of Heywood – directions to multiple parties due to limited FCAS in SA	√ TIPS x Pelican Point	√ TIPS √ Pelican Point	√ TIPS √ Pelican Point	
1 Dec 2016	Security event following separation (voltage) – directionto Mortlake	x	x	X	
9 Feb 2017	Reliability event – directionto Pelican Point	√	√	√	
1 Mar 2017	Reliability event – directionto Pelican Point	√	√	√	
28-29 Mar 2017	Security event in Nth Qld due to Cyclone Debbie – directionto Mt Stuart	x	x	X	
25-26 April 2017	Inadequate system strength – directions to TIPS and Hallett.	√	√	X	
The same would apply for the ~210 system strength directions issued as at late March 2019 in South Australia.					
22 May 2018	Security event in Qld (voltage) – Mt Stuart	x	x	X	
16 Nov 2018	Security event in Victoria (voltage) – direction to Newport	x	√[1]	X	While AEMO did not implement intervention pricing (IP) in this instance, it was implemented later in November 2018 in response to the same issue.
17 Nov 2018	Security event in Victoria (system strength) – directionto Newport	√	√[1]	X	While IP was not implemented in this instance, AEMO subsequently indicated that it would apply IP if such events were to arise in future.
18 Nov 2018	Security event in Victoria (voltage) – direction to Mortlake	x	√[1]	X	
24 Nov 2018	Security event in Victoria (voltage) – direction to Newport	√	√[1]	X	
30 Nov 2017	RERT activation – reliability event in Vic	N/A[2]	x[3]	√	Under the more preferable draft rule, IP would apply in relation to reliability events such as these but the approach during other kinds of events would depend on the circumstances.
19 Jan 2018	RERT activation – reliability event in Vic and SA	N/A[2]	x[3]	√	
24-25 Jan 2019	RERT activation – reliability event in Vic and SA	N/A[2]	x[3]	√	

Source: AEMC analysis

Note: [1] It is assumed that AEMO would apply intervention pricing under its proposed wording, consistent with the approach it outlined in its December 2018 position paper on *Intervention pricing for system security directions*. [2] N/A reflects that the RRN test did not apply to the RERT at the time. [3] The Commission's view is that, under the AEMO proposal, intervention pricing would not apply if no plant are available to be directed.

This table should be considered indicative only and no reliance should be placed on it.

ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CCGT	Combined cycle gas turbine
Commission	See AEMC
DI	Dispatch interval
FCAS	Frequency control ancillary services
IPWG	Intervention pricing working group
MCE	Ministerial Council on Energy
MLF	Marginal loss factor
NEL	National Electricity Law
NEM	National electricity market
NEO	National electricity objective
NEMDE	NEM dispatch engine
NERL	National Energy Retail Law
NSCAS	Network support and control ancillary services
RERT	Reliability and emergency reserve trader
RRN	Regional reference node
SA	South Australia
SRAS	System restart ancillary services
TNSP	Transmission network service provider

A HOW HAS THE REGIONAL REFERENCE NODE TEST BEEN APPLIED TO DATE?

To our knowledge, there have only been four occasions when intervention pricing was not applied as a result of the RRN test – on 13 October 2015, 1 December 2016, 28-29 March 2017 and 16-18 November 2018. These occasions are set out below.

While AEMO is required to apply the RRN test each time it intervenes in the market by issuing a direction, there is limited discussion in its market event reports as to how the test has been applied. There are some exceptions, also discussed below.

A.1 Directions to northern Queensland generators on 13 October 2015

Due to failures on the transmission network in northern Queensland, AEMO directed generators in northern Queensland to synchronise and follow dispatch targets. This was necessary in order to restore the system to a secure operating state. The report detailing the event states: "intervention pricing was not applied, as the need to restore power system security could not be met by directing plant located at the regional reference node in accordance with NER clauses 3.9.3(b) and (d)".[75]

A.2 1 December 2016: directions to multiple parties in SA

The RRN test was discussed in the AEMO report describing directions issued to multiple participants in response to security concerns in South Australia on 1 December 2016. This relatively detailed discussion of the RRN test is included in four market event reports.[76]

AEMO's report relating to the 1 December 2016 event states:[77]

> AEMO issued directions to three participants in South Australia between 0115 hours and 0500 hours. The first direction was issued to Torrens Island A1 generating unit to provide 10 MW of fast raise FCAS under clause 4.8.9 of the NER. The Regional Reference Node (RRN) test was met for this direction, that is, a direction at the RRN would have avoided the need for the direction (NER clause 3.9.3(d)). Intervention pricing was implemented from (and including) the DI ending at 0135 hours until the end of the direction at the DI ending at 0500 hours.
>
> The remaining three directions involved reducing generation at Pelican Point or reducing consumption at Olympic Dam to manage shortage of fast raise and fast lower FCAS respectively. The RRN test was not met for either of these directions, that is, a direction at the RRN would not have avoided the need for the direction. However, since these directions overlapped with the first direction for which the RRN test was met, AEMO applied intervention pricing for all intervals between the DI ending 0135 hours

75 AEMO, *NEM Event – Directions to northern Queensland generators – 13 October 2015,* July 2016, p. 9.

76 Two reports relating to 1 December 2016 (one relating to directions to multiple participants, and one relating to a direction to Mortlake power station), one report relating to 9 February 2017 and one report relating to 1 March 2017.

77 AEMO, *NEM Event - Direction to South Australia Participants - 1 December 2016*, November 2017, pp 10-11.

and 0500 hours.

It is not entirely clear from the above discussion why AEMO considered that the RRN test was not met by the direction to Pelican Point. For example, was it because issuing a direction to reduce generation to a plant at the RRN would not have been practicable in the particular circumstances of that event? Adopting the approach outlined in the 2011 AEMO Briefing Paper, it could be argued that equivalent intervention at a plant located at the RRN *would* have removed the need for the intervention. This is because managing a scarcity of FCAS can be done anywhere in the network (so long as there are no network constraints in place). It is also unclear whether the direction to Olympic Dam was a direction to which the RRN test should have applied.[78]

If AEMO's view is based on the location of the actual plant, it is not clear how this approach would apply in regions where there is no actual plant located at the RRN. There is also a potential inconsistency in that the directions issued to Pelican Point on 9 February and 1 March 2017 (discussed below in section A.5.) were both considered to meet the RRN test (so intervention pricing was considered appropriate), while the above direction to Pelican Point issued on 1 December 2016 was considered not to meet the RRN test (so, all else equal, intervention pricing should not apply).

It is also worth noting that Pelican Point is very close to the South Australia RRN and in fact has a lower marginal loss factor (MLF) than Torrens Island Power Station.

The RRN test asks whether a direction in respect of plant at the RRN would have avoided the need for *any* direction which constitutes the AEMO intervention event to be issued. This may be interpreted as suggesting that, where an intervention event comprises multiple directions, intervention pricing should not apply if any of the directions that comprise the event do not meet the RRN test. Such an interpretation might suggest that intervention pricing should not have applied in this instance given AEMO had concluded the directions to Pelican Point and Olympic Dam did not meet the RRN test. However, this is not how the test was applied by AEMO in the above instance in which AEMO concluded that the direction to Torrens Island power station met the test and therefore applied intervention pricing.

AEMO's submission to the consultation paper clarified its approach where multiple directions are issued simultaneously. The approach outlined reflects that adopted in AEMO's Intervention pricing methodology whereby relevant directions will be factored into the intervention pricing run and irrelevant directions will not be factored into the intervention pricing run.[79] The Commission considers that this part of the RRN test is not clear and, as discussed in chapter 5, suggests amendments to clarify the intended approach.

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78 The market event report for this event (ibid, p. 2) says "AEMO directed Electranet to instruct BHP Olympic Dam to reduce load by 45 MW (until and including DI ending 0250 hours) and 60 MW (between and including DI ending 0255 hours and 0500 hours) under Section 116 of the NEL." It is noted that the RRN test does not apply to clause 4.8.9 instructions, only to directions. "Direction" is defined in chapter 10 of the NER as having "the meaning given in clause 4.8.9(a1)(1)". That provision in turn refers to requiring a registered participant to take action as contemplated by clause 4.8.9(a) or section 116 of the National Electricity Law in relation to a scheduled plant or a market generating unit. By contrast, if AEMO requires a registered participant to take some other action (i.e. other than in relation to a scheduled plant or market generating unit), AEMO is taken to have issued a clause 4.8.9 instruction. Thus, the direction to ElectraNet to instruct Olympic Dam to reduce load appears to be a clause 4.8.9 instruction rather than a direction.

79 AEMO, *Intervention pricing methodology*, February 2019.

A.3 1 December 2016: direction to Mortlake power station

Due to the loss of the Heywood interconnector, SA became islanded from the rest of the NEM in the early hours of 1 December. During the separation event, a number of directions were issued to participants in SA (as discussed above). Following the event, SA remained at risk of another separation event and a limit was imposed on Heywood interconnector flows. When Mortlake power station in Victoria commenced generating, a number of constraint equations were violated and flow on the interconnector exceeded the limit imposed. AEMO directed Mortlake to desynchronise.

The AEMO report following the event states:[80]

> The RRN test in accordance with clause 3.9.3(d) was not met for this Direction, that is, a direction at the RRN would not have avoided the need for the Direction. The voltage unbalance issues at APD could only be resolved by reducing output from Mortlake PS, hence a Direction at the RRN would not have avoided the need for the Direction. Intervention pricing was not implemented for this Direction since the RRN test was not met.

There is no discussion in the report regarding any network constraint between the Victorian RRN and Mortlake Power Station (which would be relevant if applying the approach to the RRN test outlined in AEMO's 2011 Briefing Paper). The situation was simply that the synchronisation of Mortlake Power Station was what caused the problem and hence only a direction to Mortlake could fix the problem. In other words, a direction to a specific plant was required – not a generic or notional plant located at the RRN.

The characteristics of specific plant are also relevant in determining which generators are required to maintain system strength. For example, are the plants synchronous or asynchronous, slow start or fast start? What is their location and how does the plant contribute to fault levels in various parts of the power system? Given this, it could be argued that the approach adopted in relation to the Mortlake direction (when intervention pricing was not implemented) is also appropriate in relation to system strength directions.

In the case of South Australia (SA), however, it happens that directing Torrens Island power station (located at the RRN) can provide the requisite system strength. On this basis, AEMO considers that the RRN test is met and applies intervention pricing in connection with all system strength directions in SA, irrespective of whether those directions include a direction issued to Torrens Island power station. Whether this approach would hold in other regions is an important question. Ideally, the test should be capable of delivering theoretically consistent pricing outcomes across the NEM in relation to directions for the same issue, rather than producing different results depending on the location of generators relative to the RRN in each region.

80 AEMO, *NEM Event – Direction to Mortlake Generating Unit 12 – 1 December 2016,* November 2017, p. 9.

A.4 28-29 March 2017: directions to Mt Stuart power station

The following description of the directions issued by AEMO on 28-29 March 2017 is taken from the SW Advisory and Endgame Economics report commissioned by AEMO.[81]

> On 28 March 2017, tropical cyclone Debbie made landfall between Bowen and Proserpine in Queensland, and continued in a south west direction. This led to a reclassification of the loss of certain transmission lines as a credible contingency, requiring additional capacity to be brought online in northern Queensland so as to maintain the power system in a secure operating state. When the market failed to respond, a direction was issued to Mt Stuart power station to come online.
>
> Intervention pricing was not implemented during the intervention event, because the RRN test was not satisfied, i.e. the same direction, or change in generation, at the regional reference node would not have alleviated the need for the constraint. Put another way, the requirement for generation could only be met by generation on the non-RRN side of the constraint.
>
> This is the first example we have seen of an intervention to obtain generation during a time of scarcity where there was no intervention pricing, in this case because of the RRN test. The RRN test is a clear example of a decision embodied within the market rules that, in some circumstances, there is no rationale for taking steps to signal the scarcity of generation. Specifically, the RRN test implies that we draw the line at signalling scarcity of energy at an intra-regional level.
>
> This is an important observation – the Rules contemplate that there are times when no steps will be taken to redress the effect of an intervention on market prices.
>
> Intervention was to obtain an unpriced service
>
> This is also an example of an intervention to obtain an unpriced service. In this case, the directed generators would not have been paid through the spot market for the service that they were providing. Even if the contingency had occurred, Clause 3.9.7 of the Rules explicitly states that:
>
> "In the event that a network constraint causes a scheduled generating unit to be constrained-on in any dispatch interval, that scheduled generating unit must comply with dispatch instructions from AEMO in accordance with its availability as specified in its dispatch offer but may not be taken into account in the determination of the dispatch price in that dispatch interval."
>
> In other words, had the contingency occurred the constrained-on generators would not have received the market price cap *even if they were preventing load shedding*. There is therefore no signal to the generators to provide the service – it is unpriced in the spot market.
>
> It follows that there is no case here for intervention pricing, of course noting that

81 SW Advisory, op cit, pp 23-24.

> intervention pricing was not applied because of the RRN test.
>
> If the NEM had a spot market in locational (sub regional) FCAS or Network Support and Control Ancillary Services (NSCAS), this would be a case for intervention pricing. But the NEM does not have spot markets in either of these potential services... Hence NSCAS is an unpriced service in the spot market.

Of note is that, consistent with the above comments, the service of system strength is also an unpriced service in the spot market. The Commission considers that the underlying rationale of preserving market scarcity signals is not applicable to system strength directions given that there is no relevant market for system strength.

The AEMO market event report describing the Mt Stuart direction states: "Intervention pricing was not applied, because the need to restore power system security could not be met by directing plant located at the regional reference node in accordance with NER clauses 3.9.3(b) and (d)."[82]

A.5 Reliability events on 9 February and 1 March 2017

There is a brief discussion of the RRN test in two reports relating to reliability related directions issued to Pelican Point on 9 February 2017 and 1 March 2017. The February 2017 report states "the RRN test was met for this Direction, i.e. a direction at the RRN would have avoided the need for the Direction."[83] Similarly, the March 2017 report states: "the RRN test was met for this direction, meaning that a direction given in respect of plant at the RRN would have avoided the need for the direction."[84]

The approach in both of these reliability-related reports is consistent with the existence of a lack of reserve (LOR) condition in SA at the time the directions were issued: this LOR condition could be addressed by plant at the RRN (or anywhere in the region, assuming there were no network constraints) coming online or increasing output. This approach is consistent with the 2011 Briefing Paper's reference to equivalent intervention at the RRN.

Alternatively (although this seems less likely given the wording of the reports), AEMO may have based its decision on the fact that Pelican Point is very close to the SA RRN and in fact has the lowest marginal loss factor (MLF) of any generator in SA.

82 AEMO, *NEM Event - Directions to Queensland Generators - 28 and 29 March 2017*, January 2018, p. 8.
83 AEMO, *NEM Event - Direction to South Australia Generator - 9 February 2017*, July 2017, p. 12.
84 AEMO, *NEM Event - Direction to South Australia Generator - 1 March 2017*, January 2018, p. 11.

B LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this draft rule determination.

B.1 Draft rule determination

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

The Commission's reasons for making this draft rule determination are set out in section 4.4.

A copy of the more preferable draft rule is attached to and published with this draft rule determination. Its key features are described in section 4.4 and chapter 5.

B.2 Power to make the rule

The Commission is satisfied that the more preferable draft rule falls within the subject matter about which the Commission may make rules. The more preferable draft rule falls within s. 34 of the NEL as it relates to s 34(1)(a)(i) regulating the operation of the spot market, and s 34(1)(a)(iii) regulating the activities of persons participating in the spot market.

B.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first round consultation
- the Commission's analysis as to the ways in which the proposed rule will, or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[85]

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.[86] The more preferable draft rule is compatible with AEMO's declared network functions because it leaves those functions unchanged.

85 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council.

86 Section 91(8) of the NEL.

B.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NER be classified as civil penalty provisions.

The more preferable draft rule does not amend any clauses that are currently classified as civil penalty provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the draft rule be classified as civil penalty provisions.

B.5 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NER be classified as conduct provisions.

The draft rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the draft rule be classified as conduct provisions.