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Dear John

CONGESTION MANAGEMENT REVIEW

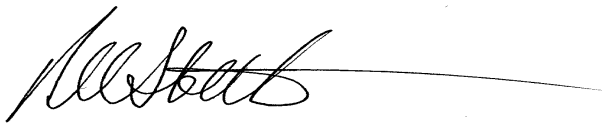
The Newcastle Group of market participants has prepared a joint submission to the Australian Energy Market Commission's *Congestion Management Review Issues Paper* dated 3 March 2006.

The Group is an informal mix of industry participants with a common interest in developing workable and pragmatic solutions to important NEM regulatory issues. The attached submission was endorsed by the following Group members:

- AGL
- Delta Electricity
- Intergen
- LYMMCO
- Macquarie Generation

The management of transmission congestion in any competitive wholesale electricity market presents contentious and complex problems. The Group's submission focuses on some of the key issues in the review and proposes a framework for assessing the materiality of congestion problems and a package of possible measures for consideration by the Commission.

Yours faithfully



RUSSELL SKELTON
MANAGER MARKETING & TRADING

On behalf of the Newcastle Group

17 April 2006

NEWCASTLE GROUP SUBMISSION

TO THE AUSTRALIAN ENERGY MARKET COMMISSION

CONGESTION MANAGEMENT REVIEW – ISSUES PAPER

Background

Management of intra-regional congestion has been a contentious issue since the commencement of the National Electricity Market in 1997. This is not an uncommon problem internationally, as policy markers and regulators seek to design a functional interface between competitive wholesale electricity markets and monopoly-based network systems. Intra-regional transmission congestion is a particularly difficult area as it can cause perverse bidding incentives within the existing regional market structure.

The extent and location of network congestion has varied through time as binding constraints have emerged throughout the NEM and TNSPs have invested in augmentation work to relieve congestion pinch-points. Intra-regional congestion in the Snowy Region has been the one constant problem over recent years and the cause of a prolonged debate amongst participants and regulators as to possible fixes and solutions. While the Group was unable to agree on a specific response to the Snowy Region issue, all group members agreed that the AEMC, as the independent rule maker for the NEM, should determine a long term solution to the Snowy problem as part of the current package of reviews on congestion management and regional boundary arrangements. The AEMC should not postpone the hard call on the Snowy Region issue for another time or another review.

The Group does not consider that the case has been made for fundamental change to the current market rules as they relate to congestion management in the NEM. The terms of reference for the review require the AEMC to identify and develop improved arrangements for managing financial and physical trading risks associated with material network congestion. Any move to some form of nodal pricing or multiple new regions would increase the risks and complexity of financial trading in the NEM.

Apart from resolution of the Snowy Region, changes to the rules covering congestion management should be incremental and supported by a robust assessment of the costs and benefits of any new measure. Part of the assessment will require an examination of the materiality of congestion in the NEM and the likely changes to this level of congestion through time. If congestion is not a material or enduring problem, then the NEM does not need to develop complex and costly mechanisms to manage a problem that is best resolved through new investment.

The NEM open access regime allows any new generation investor to build and commission plant provided they pay for the infrastructure required to connect to the main transmission system. Any investor in the NEM would take account of a range of factors that would affect the economics of a project – fuel, water, air shed and access to load centres. A new generator that locates in a generation-rich part of the network may create network congestion that limits the ability of existing generators to supply major load centres. This could then lead to perverse bidding incentives for generators in that part of the network as they attempt to ensure they are dispatched ahead of neighbouring plant.

The Group has proposed a concept that would provide a transmission price signal to new investor roughly equivalent to the incremental congestions costs that are imposed on existing generators. The Group does not wish to endorse any particular model at this point of time, but would like to open the debate on the potential merits of transmission locational price signals for new generation investment as a possible complement to existing arrangements for managing congestion in the NEM. Transmission locational signals could minimise the likelihood of generation investment causing congestion.

The Group considers that the AEMC should consider the materiality of existing and likely future congestion before recommending the development and introduction of any new measure for managing congestion, such as those proposed in this submission or the CSC/CSP regime. It is possible that industry regulators and participants could dedicate time and effort to the development of complex trading tools that are infrequently applied.

The Snowy Region boundary

Regulators and industry participants have proposed a range of policies and mechanisms to mitigate and correct the misalignment of dispatch incentives created by intra-regional congestion in the region over recent years. The problem with the Snowy Region is compounded by the fact that it lies in the middle of the NEM between major generation and load centres. Any inefficient dispatch in the Snowy Region has repercussions for generators and customers in all NEM regions.

The problems with transmission congestion in the Snowy Region are unique in the NEM:

- Snowy Hydro owns and operates the generation assets on either side of the intra-regional constraint and has a higher degree of control than all other generators in managing the incidence of intra-regional congestion through its bidding behaviour;
- Given the nature of the terrain in the area, there appears to be limited scope for material improvements in the short to medium term to alleviate the incidence of intra-regional congestion between the Murray and Tumut connections nodes.

The debate over the Snowy Regional boundary issue reflects the fact that once a regional structure is established and operating it is difficult to amend the status quo without creating commercial winners and losers and exposing participants to new and uncertain risks.

The AEMC will need to make a judgement on the benefits and costs of alternate mechanisms and amend the market rules in a way that gives effect to an appropriate solution to the Snowy problem. This could be through a one-off rule change in response to the Macquarie Generation and Snowy Hydro proposals or through changes to the regional boundary review process. Further temporary solutions without a longer-term plan to address the Snowy issue will only prolong the debate and distract attention from more important regulatory issues.

Materiality of transmission congestion

Historically, the NEM can be characterised as a market where congestion is insignificant in economic terms. The data provided by NEMMCO to the AEMC (Table 1 of the issues

paper) shows no clear trend of increasing incidence of intra-regional congestion or that the total number of hours of congestion is significant. The worst-case congestion for a region in recent history is less than 5% of the time under system normal conditions. This data is for all network congestion in each region and it is unlikely that all of this congestion occurred across the same network elements.

The AER, working in conjunction with NEMMCO, determined that the total constraint cost across the NEM in 2003/04 was of the order of $150 million on top of a total wholesale trading value of around $8 billion in the same year. Of this about $60 million results from the generator support payments in Queensland which are deliberately induced for economic reasons and, arguably, should be excluded. On this basis, the total constraint cost in 2003/04 was about 1% of the value of wholesale trade in that year.

It would be helpful for the AEMC to request NEMMCO to provide more disaggregated data on the level of congestion in the NEM to support a more complete assessment of the problem.

However, the question remains as to whether this situation will continue into the future. At face value there appears to be no reason to expect congestion costs to become materially more significant in the short to medium term (5 to 10 years). This can be understood by considering the underlying future drivers of congestion levels as follows:

1. Significant intra-regional transmission system capability enhancement;
2. Processes to ensure that economic congestion relieving transmission investment also occurs; and
3. Fundamental differences in the cost of generation across the NEM.

Each of these is discussed briefly in turn.

Transmission system capability enhancement

If the transmission system capability is progressively improved in line with the expected increases in utilisation then it is unlikely that transmission congestion will increase materially in the short to medium term.

A quick review of the levels of planned transmission investment provided for by the NEM TNSPs indicates a total forecast investment of around $5 billion over the next 5 years. According to the NEM transmission network owners the vast majority of this investment is required to meet mandatory reliability requirements. This focus on reliability investment is readily confirmed by a review of the most recent Annual Planning Reports produced by the NEM TNSPs.

The extent to which reliability driven planning standards are driving intra-regional transmission system development is significant. This implies that these systems are being developed to preserve a degree of 'reserve' capability during system normal conditions (where system normal includes peak periods with all transmission network elements in service and off peak and shoulder periods with concurrent planned transmission outages). Reserve capability is typically required to ensure that there is no interruption of service to customers for a range of pre-defined system contingencies. Furthermore, this reserve capability is almost always present on the shared transmission network.

In summary, as long as the TNSPS develop the transmission system over the next 5 to 10 years to meet current mandatory reliability standards, the Group expects that intra regional transmission congestion will remain at relatively low levels within each existing region.

Congestion driven transmission investment

While intra-regional transmission investment is largely driven by mandatory reliability requirements there is also scope for additional transmission investment based on the 'market benefits limb' of the regulatory test. This 'limb' provides an opportunity for transmission investors to pursue additional transmission development where they can demonstrate that the level of congestion is uneconomic.

Provided that current regulatory settings are confirmed through the current AEMC review of transmission revenue setting Rules, then there ought to be a relatively strong incentive for most NEM TNSPs to seek out these types of development opportunities. The main drivers include reasonable and stable regulated rates of return on transmission investments. The current draft AEMC Rules appear to go some way to achieving these outcomes.

Overall, the market benefits limb of the regulatory test provides a means for transmission businesses to achieve regulatory recognition of congestion relieving investment, and the emerging revenue setting Rules appear to provide the necessary incentives for transmission businesses to pursue congestion relieving investments. Accordingly, it is reasonable to expect these investments to come forward to relieve uneconomic congestion that is not addressed, by default, by investment required to meet mandatory planning standards.

Fundamental differences in the competitive advantage of generators

Overall, NSW, Queensland, and Victoria all have low cost indigenous fuel sources for the generation of electricity. The generators in each State are also subjected to competitive market conditions. Accordingly, it is unlikely that there would be material price differences between the existing NEM regions. This situation is unlikely to change markedly in the short to medium term unless there is a significant policy change as the jurisdictional level, for example through the imposition of onerous state-specific greenhouse measures. The Group expects that the NEM, with the current levels of interstate transmission capability, would continue to experience low to modest levels of overall congestion.

Overall expectations

Based on this analysis it would appear that it is most unlikely that there will be a material intra- regional congestion issue sufficient to warrant the introduction of a new set of arrangements to manage congestion or the creation of regional boundaries unless an issue with the location of new generation emerges.

This materiality of intra-regional congestion is essentially a quantitative issue and the Group would recommend that the AEMC undertake some modelling in conjunction with the TNSPs and NEMMCO to asses the materiality of expected intra-regional congestion into the future to confirm whether in fact a material level of intra-regional congestion is likely.

The Group is of the view that once the Snowy region issues are resolved that it is most unlikely that any further regional boundary adjustments will be required in the foreseeable future.

Locational signals for new generation investment

Locational signals for new generation underpin efficient investment decisions. The NEM does have strong locational signals for new investment which include:

- regional reference price;
- fuel and water - price and availability;
- environmental impacts;
- likely levels of intra and inter-regional congestion;
- 'shallow' connection charges; and
- transmission losses.

In addition to these factors, potential generation investors have ready access to a lot of information on existing and likely future levels of transmission system capability. The TNSPs and NEMMCO publish various documents including annual national transmission statement, annual planning reports and regulatory test assessments. Potential investors can also access information directly from TNSPs when making connections inquiries.

Despite the above signals, the Group is aware of several examples where investors have located generation projects in parts of the network that have created or contributed to transmission congestion. This may occur for a number of reasons, for example lower land prices or lower fuel costs. New entrant and incumbent generators must then compete for access to major load centres. This can create some perverse market outcomes as generators bid plant into the market in an attempt to ensure dispatch.

The Group is also aware of examples where new generation investors have made contributions to augment the local transmission system. New generation projects planned to located on the remote side of these generators will create some degree of transmission congestion on those transmission elements that were partly funded by the original generator.

The Group considers there may be a case for developing an additional mechanism that would signal and value the incremental congestion costs imposed by new entrant generators if they locate in congested parts of the network. Some form of locational price signal would encourage new investors to consider sites that better utilise existing transmission infrastructure.

The Group would like to propose a locational pricing model for further investigation based on arrangements that apply in international markets with some possible modifications that take account of the application of the regulatory test in Australia.

Generator system contribution payment

Alberta has adopted a policy of applying a generator system contribution payment to new entrants to cover some of the costs of transmission augmentations resulting from location decisions.[1][2] The policy requires the payment to:

- be simple, stable, predictable and known upfront;
- vary based on generator size;
- provide a location-based signal related to generator proximity to load;
- cost reflective but not based on actual transmission elements or specific costs incurred to upgrade the transmission system to accommodate a generator;
- a fair and reasonable amount (that is, $/MW of capacity) in order to require all new generators to make a financial contribution to system upgrades;
- be unaffected by the actions of other generators and not change when another generator connects to the system;
- be paid up front or paid over time, subject to satisfactory security provisions.

The payment applies to generators that locate in parts of the network where generation exceeds load. In regions where load exceeds generation no payment is required. This is based on the premise that in generation-rich parts of the network, a generator needs the transmission network to gain access to the market and therefore should contribute to the funding of the network.

A generator that is required to make a payment because it has located in a generation-rich part of the network is reimbursed the payment over ten years with the network operator recovering the contribution from load customers. If the generator does not satisfy a technology-specific minimum capacity factor it is not reimbursed, ensuring that customers do not have to pay for under-utilised network assets. Benefits of this model are certainty for all parties, generator indifference to specific network development paths and avoidance of free-rider concerns.

A possible variation to this model would oblige a prospective new generation investor to make a request to the network owner to undertake the Regulatory Test to examine the economic viability of a transmission augmentation to relieve any congestion resulting from its locational decision.

To the extent that the augmentation shows benefits under the Test, the new entrant would not be required to make a contribution. Instead the new entrant would pay only for the network augmentation costs in excess of that justified under the Test to provide it with its desired level of access to the market. Both the new entrant and the network owner would be obliged to coordinate their respective investments.

It is worth noting that VENCorp's arrangement for a connection applicant to bring forward a network augmentation to relieve congestion is similar alternative solution.

An additional initiative that would support the efficient location of new generation investment is the publication of the following connection related information:

[1] http://www.energy.gov.ab.ca/docs/electricity/pdfs/transmissionPolicy.pdf
[2] The Payment is not applied to incumbents because they cannot relocate and, given their sunk costs, have limited freedom to reduce their output.

- Maximum power injection at major busbars (or 'regions' as defined in ANTS) without causing congestion in a region or the national transmission flow paths.
- Connection charges at major busbars (or 'regions' as defined in ANTS) above this maximum power injection.

A comprehensive transmission access rights regime applied subsequent to new generation investment is not seen as a solution to the problems of perverse market outcomes resulting from the inappropriate location of a new entrant. An access rights regime will add to market complexity and uncertainty and is contradictory to an open access network.

Generator nodal pricing

The Group does not support nodal pricing in the NEM as it would adversely impact on the functioning of the financial market and add to the cost and complexity of hedging arrangements for retailers.

The Group's view is that the constraint support pricing and constraint support contracting regime (CSP/CSC) proposed by Charles River Associates faces a number of high hurdles before it can be seriously considered for widespread use in the NEM.

The Group's understanding is that the idea behind the scheme was to provide improved pricing signals to generators behind the constraint to improve productive and dynamic efficiency by providing some form of transmission access rights. In the event that it is established that such a regime is necessary in our view there are major unresolved issues with the CSP/CSC scheme as proposed.

The threshold issue for the CSP/CSC scheme and also the schemes discussed above is whether the costs and complexity of putting in place the necessary institutional arrangements for the allocation of the CSCs or the definition of incumbents current access to determine the amount of new entrants should pay for transmission is warranted.

The establishment and allocation of any constraint support contracts or definition of access could be complicated and would create major uncertainty for participants particularly when there are inter-connectors and multiple generators seeking access rights for a congested network element.

NEMMCO use of system security Rule provisions

An issue that is related to congestion management in the NEM is the ability of NEMMCO to intervene in the market in order to maintain system security. This intervention can either be short term where NEMMCO act on the day to manage a system security issue or alternatively long term where NEMMCO introduce changes to how constraints are managed in the interests of managing system security. Both of these forms of intervention have the potential to impact on how congestion is managed in the market and therefore must be taken into account in this review of congestion management.

It is acknowledged that NEMMCO must act to ensure that the risk of the system failing is minimised however it is important to understand that the system is never in a risk free state

and that system security is not an absolute but an area where trade-offs must be made in terms of increased costs for increased levels of system security.

In order to improve the transparency of actions taken by NEMMCO to manage system security the AEMC should , as part of the current review, require NEMMCO to introduce the use of a simple measure of the level of system security of the power system at any point in time. This would introduce some transparency and hence enable participants to better understand the likely actions of NEMMCO. This measure could also be used to help assess the trade-offs that will be necessary in considering action to change the level of system security where costs are incurred.

This proposed approach would improve transparency and therefore balance in NEMMCO's decision making processes.

NEMMCO constraint formulation processes

NEMMCO currently publishes an internal procedures document detailing its approach to the formulation of network and frequency control ancillary services constraints.[3] The procedures document includes guidelines on the placement of terms in constraint equations – either the right-hand or left-hand sides of equations. Currently, NEMMCO determines where an inter-connector or generator is placed in an equation based on its relationship with the inter-connector or generator with the largest impact on a constraint.

These formulation procedures have a substantial impact on commercial outcomes in the NEM. Small changes in coefficients or the thresholds for including generators in constraint equations can have major financial impacts, for example through constraining-on or constraining-off of participants, depending on the circumstances.

Given the importance of the constraint equations in determining dispatch and settlement outcomes, the Group believes that there is a case for greater codification of the principles for formulating constraint equations to minimise NEMMCO discretion. These principles should cover the materiality of terms included in equations, the management of counter-price flows, procedures for altering constraints in response to possible security and reliability triggers and notification obligations on NEMMCO when constraints are reconfigured.

The Group believes that the AEMC would be best placed to develop constraint formulation principles. If the principles were included in the NEM Rules they would then become subject to the AEMC's consultation procedures before amendment to the principles could be considered. The AER would then have a role in monitoring whether NEMMCO, in formulating or reconfiguring constraint equations, had acted in a manner consistent with the principles established in the Rules.

Constrained-on generation

A generally accepted principle of the original market design was that the NEM would pay generators in accordance with their offers. As NEMMCO continues to reconfigure

[3] NEMMCO, Network and FCAS constraint formulation, Version no. 8, 4 July 2005.

constraint equations across the NEM in the Option 4 format, the number of equations that contain both negative (constrain-on) and positive co-efficient terms (constrain-off) terms on the left-hand-side of an equation will increase significantly.

The Group considers that there is a flaw in the wholesale market design when the system operator can compel a generator with a negative co-efficient to sell into the NEM at a price below the amount the generator was prepared to offer its output.

The Group considers that the AEMC should recommend changes to the market rules that would ensure generators are always paid at least their bid price for any constrained-on generation.

A generator's offer price provides the best proxy for a generator's opportunity cost at any point in time. The offer price reflects the underlying costs of production, namely fuel costs, as well as those other factors that a generator must constantly take into account. Introducing a system of independent assessment of a generator's opportunity costs is by design an artificial process that may not consider all of the inputs and trade-offs that are encapsulated in a generator's dispatch offer.

The AEMC canvasses the possibility that a generator may increase its offer price if it knew that it would be required to generate when a particular constraint bound. This suggestion presumes that a generator would know in advance when congestion is likely to occur and is prepared to take the risk that it would not be dispatched if the congestion did not materialise. The Group considers that it is becoming increasing difficult for generators to predict when congestion may arise, particularly intra-regional congestion, and there are a number of other factors that would mitigate the impact of any transient market power.

The use of constraint equations to constrain on generation hides the impact of network congestion. Any move to explicitly price such congestion through the payment of offer prices to generators should provide a visible signal as to the cost of that congestion. This should in turn invite a market or regulatory response to address the underlying problem, depending on the scale of the congestion issue. The response could be in the form of new generation investment, transmission upgrades or demand-side action. Alternatively, it could provide a signal to NEMMCO to revise its approach to constraint equation formulation.

The Group recognises that any additional payment to generators above the regional reference price would need to be funded in some way. It is difficult to think of any feasible alternative to a levy on industry participants that would be passed through to customers. An uplift payment of this type is similar to the funding arrangements that apply when NEMMCO issues directions to market participants for system security purposes. While this may make the task of retailing marginally more difficult, the overall benefits from improved signals to generators would outweigh the administrative costs involved.