

Annual Interconnector Review

Background

The Code currently requires NEMMCO to use its 'reasonable endeavours' to get the IRPC to conduct an Annual Planning Review of transmission systems. NEMMCO believes it has fulfilled its obligations under the Code in relation to the Annual Planning Review, although none has been produced.

The Network and Distributed Resources Code change proposals are currently with the ACCC for authorisation. The ACCC issued a draft determination on these Code changes on 20 August 2001. In the event no pre-determination conference is called, these Code changes will be accepted.

The IRPC have agreed to produce an Annual Interconnector Review (AIR) in advance of the Code changes being promulgated. As stated previously, the AIR and the Annual Planning Review are similar in scope with respect to inter-regional transmission so this action is also consistent with the current Code arrangements.

The NEMOC have decided to produce an indicative outline of the AIR, specifying what they believe to be appropriate content. To this end a NEMMCO proposal was circulated prior to the August 2001 NEMOC meeting. At the meeting, a counter proposal was circulated by Powerlink Queensland. This paper builds on the Powerlink proposal which was aimed at addressing specific clauses in the Code.

As at the end of August, the IRPC had not considered either proposal.

Approach

This paper considers the NDR Code change proposals and attempts to interpret their meaning in order to define a Code compliant AIR. NEMMCO believes that it is not appropriate to withhold information of relevance to market participants and other interested parties and notes that inter-regional (or inter-jurisdictional) planning information is not presented in any depth by the annual planning statements produced to date by the jurisdictional planning bodies.

In relation to interconnectors NEMMCO believes it is better to provide more rather than less information because of the significant impact on the market and, in particular, the effectiveness of inter-regional trading. This approach is supported by recent interviews conducted by a NEMMCO working group examining interconnector approval processes. The working group reported that there was a strong requirement for more information on interconnection options to be provided to the market. Another finding of the working group was that there was data asymmetry in relation to networks and that it was difficult for non-incumbents to fully appreciate issues related to network limits and the costs associated with relieving these limitations.

Further, several commentators have stressed the need for more joint planning to take place with many interested parties even suggesting that a national planning body – not NEMMCO – should be established. All of these factors lead NEMMCO to believe that it would be appropriate to provide as much information as possible in the AIR rather than attempt to provide the absolute minimum that would be required to satisfy one interpretation of the Code.

An overview of the NDR Code Provisions

The relevant clause is 5.6.5 and the introductory clause (a) requires NEMMCO to use its reasonable endeavours to ensure the IRPC undertakes an annual interconnector review with respect to:

- The *need for inter-regional augmentations*; and
- The *impact of augmentations on inter-regional transfer capabilities*.

This consultative process is directed to consider a range of matters including forecasts, different market development scenarios, committed projects and applications to construct new network assets.

NEMMCO's interpretation of this introductory clause is that the outlook period is up to ten years and the scope of work is broad.

Two key points are:

- The interpretation of the word '*need*'; and
- How the matters outlined in the Code can effectively be assessed.

NEMMCO's interpretation of this initial clause is that it is difficult to see how a *need* can be assessed in a meaningful way without assigning a dollar value and that the scope of work implies simulation of the NEM for a variety of scenarios to assess how this *need* is affected under each scenario.

Clause (b) requires NEMMCO to bring forward estimates of generation dispatch and regional prices based on historical information in order to assess the *need* referred to above. This is clearly forward looking and is consistent with a need to perform market simulation studies.

Clause (c) requires members of the IRPC to bring forward information to support the AIR. Relevant information might include, for example, committed, planned or likely network developments which could be expected to have an inter-regional impact as well as technical information necessary to identify limiting network elements of the existing networks.

Clause (d) is a best endeavours requirement on the accuracy of the information.

Clause (e) relates to *part* of the AIR and requires the IRPC to do certain things, namely:

- Identify the magnitude and significance of future network losses and constraints;

Three key words in the clause open to interpretation are *identify, magnitude and significance*.

In this context, magnitude of network losses and constraints appears relatively clear and could be established, for example, by performing a number of studies out into the future which determine the MW loss on each interconnector and how the interconnector limits might change. The scope of this work is related to the scope of clause (a), of which the activities in this clause form *part*. This is predominantly a technical assessment which is consistent with the stated intention to have the IRPC focus on technical issues.

The significance of network losses is less straightforward. For example, 30 MW loss at a time of peak load could be argued to be more significant than 30 MW of loss at time of low power system load or high reserves. High losses are significant from a greenhouse gas perspective but this would be considered outside the scope of a NEM study. It would appear that significance may well be

related to both timing and cost issues, both of which could be assessed in market simulations.

Identify in this context could perhaps be closely aligned with 'establish'.

- Identify options for the reduction or removal of constraints or a reduction in network losses by a variety of means;

In terms of the technical role of the IRPC, this could be achieved by listing a number of development options which meet some criterion. It would seem reasonable to expect that, since the work in this clause is *part* of the more general scope of work outlined in (a), the IRPC, as a planning committee, would develop and identify options consistent with the scope and outcomes of the market simulations. Further, it would seem reasonable that these options should be 'identified' by their characteristics – the impact on inter-regional transfer capabilities and the reduction in losses which would occur. It would also seem reasonable to provide a cost estimate of each transmission option as this would be readily assessable by the relevant TNSPs but could be exceptionally difficult for others to assess, even using technical consultants. This would provide a benchmark of the regulated investment option against which other non-network options could be considered.

In summary, it would seem reasonable for the options that are identified to come out of a joint planning process using the context of possible market development scenarios. As planning studies, they should represent practical solutions to problems and any assumptions should be carefully identified.

The second part of Clause (e) requires the IRPC to develop and publish a program to review the options – presumably as defined above. Clause 5.6.4(a) requires the IRPC to provide the results of the AIR to NEMMCO for publication in the SOO. The NDR Code changes provide for two publication dates – one at the end of July and one at the end of January each year. It would seem logical to key the review program of this clause into the SOO publication dates. This would require an annual review of options. If necessary, an interim assessment could be published in January.

Structure of the Annual Interconnector Review

This section outlines a possible structure of the AIR taking into consideration the above interpretation of the NDR Code changes.

Section 1: Scenario Definitions

This section would define the underlying assumptions with respect to load forecasts, developments etc which are to be used to define the scope of the AIR. Also included would be submissions made to NEMMCO under Clause 5.6.5(a)(2).

Section 2: Provision of market and system information

This would include the information brought forward by NEMMCO under Clause 5.6.5(b) and the IRPC members under 5.6.5(c).

The information would include assumptions on bidding behaviour, key market parameters such as forced outage rates, short run marginal costs etc.

The IRPC data would include significant developments within their jurisdictions which may have inter-regional impacts. This would include committed projects, development scenarios and options being considered in the longer term which may impact on inter-regional transfers or inter-regional losses.

Sections 1 and 2 should identify all input data used for technical and market simulations. This would be similar to the data tables in the SNI Stage 1 Report. This may also facilitate the conduct of the Regulatory Test assessment by proponents who may wish to use, for example, independent SRMC, FOR and other key data.

Section 3: Identification of needs

Clause 5.6.5(a) requires the IRPC to identify the *need* for augmentations and this could be achieved by market simulations using the assumptions and information contained in Sections 1 and 2. The information from such market simulations would include projections of how inter-regional losses would change over time and how inter-regional network capability would be affected under certain market and network development scenarios. The market simulations would need to consider the inter-action of inter-

regional constraints and their variability with operating conditions. Technical support studies would be required to provide network capabilities for the market simulations.

In a practical sense, inter-regional losses could be estimated by integrating (1-MLF) as is currently done in NEMMCO's market systems, where MLF refers to the marginal loss factor for a particular operating condition. The significance of losses and constraints would be outputs of the market simulations and could include projections of inter-regional settlement residues or details of inter-regional constraint shadow prices. Typical outputs for a scenario would be a plot of loss magnitude against time and a plot of market cost against time for each constraint.

Section 4: Identification of inter-regional options

This section should include a list of inter-regional development options which the IRPC thinks are the most appropriate way of addressing constraints and reducing losses. The options should include alternatives to network developments.

NEMMCO believes the network options should come out of a joint planning process which allows the feasibility and cost of network options to be considered. NEMMCO believes it would be desirable to assess both incremental and major augmentations to inter-regional transfer capabilities.

For example, constructing a 1400 km HVDC link from central Queensland to Port Augusta in South Australia for \$700M is undoubtedly an option. This option is not meaningful to the wider market unless:

- a) the cost is known;
- b) the need driving consideration of that option – and presumably defined for a range of scenarios in Section 3 – is considered; and
- c) the impact of that option is understood (ie quantifying how losses are reduced, transfer capabilities are affected).

In general, market participants are in a reasonably good position to estimate the cost of, non-network options, but may be at a distinct disadvantage in determining network option costs because of the depth of data required to estimate this cost. This data may not even be available to consultants, as would be the case with generator or demand

side options, but would be available only to the incumbent network asset owners who would have details of ratings, cost of and options for relieving plant limits etc.

NEMMCO therefore believes items (a) through (c) should be provided for each network option.

For non-network options, costs should be estimated where possible with care being taken to identify any underlying assumptions. For example, a generation option may be costed on the basis of (stated) typical open cycle gas turbine costs and fuel costs. Some costs, such as demand side developments, may not be readily estimated.

Section 5: Program for the review of options to remove constraints

This section should outline the process adopted by the IRPC to review options identified in Section 4. As the AIR results are published in the SOO, it would seem appropriate that the process be an annual one with an opportunity for a 6 monthly review in the event that significant developments affect the needs or options published in the main SOO publication (ie at the end of July each year).

Miscellaneous:

There may be a need to publish, as appendices, contributions from individual or groups of TNSPs or reports associated with the key scenario and market information covered in Sections 1 and 2.

Market impact of options – not mandatory

Although not specifically required by the Code or not consistent with a predominantly technical nature of IRPC activities, the market would probably benefit from an assessment of the market impact of regulated network options. The complexity of network limits and the interactions between inter-regional constraints would seem to support indicative impacts being assessed. The provision of inter-regional residues, for example, gives an indication of the maximum constraint benefit that a network option could deliver. However, market simulations would be required to assess what component of this benefit could be captured by an option.

As this appears to be a contentious issue, the framework outlined above would nevertheless represent a significant advance on information currently available to market participants and other interested persons in relation to inter-regional development options. The provision of data would allow others to form their own views on the market impacts. The reasons why options should not be assessed in terms of the extent to which they meet the need defined in Section 3 is not clear as it would not seem to be precluded in the Code provisions.

The provision of network option costs is a key feature of the above proposal. It will allow readers to perform an initial assessment of non-network alternatives against regulated network options as well as gain some understanding of the cost of incremental as opposed to quantum changes in network transfer capability.

Whether the market impact of options is provided – for defined assumptions - will depend on the willingness of the IRPC to provide this useful data to the market.