16 October 2008

Dr John Tamblyn
Chairman
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

By email: submissions@aemc.gov.au

Dear Dr Tamblyn,

**NEMMCO Additional Submission to Stage 2: Issues Paper-
Review of Demand-Side Participation (DSP) in the National Electricity Market**

NEMMCO submitted to this Issues Paper and has considered the matters raised by other submissions and the AEMC's consultancy reports by Charles River Associates (CRA) and The Brattle Group. Many are relevant to NEMMCO's areas of responsibility and expertise, in particular matters discussed in the CRA report and the submission by Gallaugher and Associates.

NEMMCO would be pleased to provide additional comments to both clarify current arrangements and suggest ways to progress these matters.

These comments are provided below.

This process has caused us to consider that a number of minor rule changes can be proposed to broaden the accessibility of the scheduled load and ancillary services load classifications. These are discussed in section 3.

NEMMCO appreciates your consideration of this submission. If you wish to discuss any of the matters identified please do not hesitate to contact Ben Skinner on (03) 9648 8769.

Yours sincerely,

DAVID WATERSON
General Manager
Development and Strategy

Table of Contents

1. <u>Response to Matters Raised in CRA report</u>

1.1. Definition of Demand-Side Participation (DSP)

We note the CRA paper has adopted a narrow definition of DSP consistent with the Terms of Reference[1]. Small generators have much in common with the demand-side issues raised in this report, in particular with respect to their participation in wholesale market scheduling and ancillary services markets activities. The conclusions reached in these areas are mostly common to small generators.

There are also similar but non-identical market registration issues challenges for small generators. In our response below to CRA's findings, we have considered the equivalent rules pertaining to generator registrations. NEMMCO also discussed in its original submission the need for a rule to permit small, market generators the same level of simple registration and access to competition as that pertaining to Market Loads.

1.2. Scheduled Load

1.2.1. Administrative versus Infrastructure Issues

CRA has discussed the barriers to classifying as a Scheduled Load[2]. In contemplating these issues, it is useful to separate the administrative tasks as required by the Rules and the construction of infrastructure to ensure technical compliance with that activity.

The latter refers to the technical setup and on-going management costs, such as telemetry, facilities to respond to dispatch instruction and spot market bidding. Some compliance burden in these areas is unavoidable to ensure dispatch stability. NEMMCO suspects the majority of what CRA describes as "registration" costs relate to this latter category. Where it has discretion, NEMMCO has attempted to balance the cost of participant setup and operation against the need for secure and efficient dispatch. NEMMCO would be pleased to hear of suggestions where more cost-effective arrangements could be implemented.

In considering the areas raised by CRA, NEMMCO has nevertheless identified a number of presumably unintentional barriers to classification as a scheduled load within the Rules and has proposed solutions below, see section 3.

---

[1] "The purpose of the paper is to consider demand-side matters and thus excludes detailed consideration of embedded (distributed) generation." CRA Pg 2
[2] "onerous administrative requirements to be registered/classified as a scheduled load" CRA Pg 15, see also Pg 6 & 57

1.2.2. Registration of partially interruptible loads

> "Even if a load could be controlled such that only a proportion of it is turned "on" or "off" as required, NEMMCO's registration would prevent only a part of a load being classified as scheduled – each dispatchable unit is required to have its own metering."[3]

Telemetered metering is required from a scheduled load, but bids can normally be structured such that only the volume of load that is variable is economically dispatched. However we note that a scheduled load cannot price any part of its load above VoLL, so in extreme conditions such a load may receive a dispatch target outside that range. Scheduled generating units have similar issues in relation to occasional dispatch below their minimum operating level.

1.2.2.1. Registering as a Market Customer & Prudential Issues

> "substantial transactions costs with respect to managing the administrative (NEMMCO registration) challenges of registering as a market customer;…complying with prudential requirements associated with being a Market Customer"[4].

All load in the NEM is ultimately transacted through a financially responsible market participant (FRMP), whether or not the load is scheduled. The Rules require NEMMCO to apply prudential obligations upon any FRMP who becomes a net payer to the market, which relates to the physical load and not the classification. Reclassifying an existing load as a scheduled load should not increase the relevant FRMP's prudential obligations.

We understand the issue raised by CRA and some submissions relates to the difficulty of some specialist facilitation companies to raise the collateral required to act as a market customer. That issue equally affects small retailers dealing with non-responsive demand and is best addressed in reviews and rule changes specifically focussed upon prudential matters.

1.2.3. Quantised Loads and inter-temporal optimisation

CRA noted that the single pass linear program nature of NEMDE is unable to internalise the limitations that applies to many real, demand-side operations of integer dispatch and inter-temporal limitations such as minimum on/off times[5]. As noted in our earlier submission, many of the same issues are faced by scheduled generators, who must either externally manage them through active rebidding and/or use of the Fast Start Inflexibility Profile (FSIP).

The FSIP is available for use by the demand-side and can, to a degree, address both issues. It can also assist with dispatch compliance issues, e.g. where a delayed response to a dispatch target occurs.

---

[3] CRA Pg 9
[4] CRA Pg 6
[5] CRA Pg 9,77

In 2002, following interest from market participants, NEMMCO introduced 5 minute predispatch. This provides forecasts of 5 minute prices up to 1 hour ahead, and is updated every 5 minutes. It assists the owners of plant with inter-temporal and quantisation constraints to optimise their dispatch.

With respect to the use of mixed-integer programming, NEMMCO wishes to add that:

- Whilst it may more accurately dispatch integer loads, it does not assist the inter-temporal problem; and
- It can have counter-intuitive results, e.g. it may dispatch an integer load to shutdown yet still publish a resultant marginal price below the dispatched load's bid price.

NEMMCO suggests that to properly consider this solution it would need a specific review considering the implementation in detail and its potential application to generators as well as loads.

> "…there is no mechanism or requirement for a demand-side resource to indicate its intention to rebid to manage inter-temporal constraints."[6]

Use of the FSIP allows scheduled load to effectively indicate a minimum dispatch time of up to 1 hour to NEMMCO. Further, the rule 3.8.22A (the "good faith" rule) applies equally to scheduled loads and scheduled generators and requires scheduled loads to keep bids and rebids up to date with genuine intentions.

1.2.4. Aggregated Scheduled Loads

CRA has noted that the rules empower NEMMCO to approve aggregation of scheduled load at different connection points with different loss factors where it does not materially distort central dispatch[7]. NEMMCO has not yet been approached for the aggregation of scheduled load, but relevant considerations it would need to take into account include:

- different geographical locations will have different terms in network constraint equations; and
- different intra-regional loss factors affect the ability to bid within the market price cap and floor.

However the aggregation of ancillary services loads would face fewer technical difficulties if the rules permitted it, see sections 1.3.3 and 3 below.

1.2.5. Incentive to participate

Unavoidable disincentives exist for loads and generators to become scheduled such as the infrastructure burden discussed above and the potential to be constrained by network constraints[8]. Given the choice, most entities would presumably prefer to be non-scheduled, whether or not they respond to price.

Meanwhile, there are significant potential benefits to the market as a whole in price-responsive entities becoming scheduled rather than non-scheduled, such as:

---

[6] CRA Pg 10
[7] CRA pg 9
[8] CRA Pg 7

- Improved demand-forecasting in predispatch timeframe, allowing more accurate forecasts of price and short-term reliability and security;
- Improved reliability forecasting in PASA timeframes;
- Improved optimisation of dispatch as more variables become controllable to the NEMDE;
- Potentially lower volatility and more stability in short-term price movements as more scheduled quantities become available to set price.

Note that for most generators above 30MW, becoming scheduled is mandatory, but is voluntary for most other entities. This issue will become more significant as the extent of small generation and price responsive load grows.

1.3. Market Ancillary Services Loads

For clarification, 3 pumped storage schemes as well as the Victorian smelters participate in the FCAS markets[9].

1.3.1. Registration Issues

NEMMCO observes that DSP wishing provide market ancillary services do not have to first register as a scheduled load[10]. NER 2.3.5 enables any market load to become registered as a market ancillary services load as long as it meets the technical criteria for such services. Some registered market ancillary service loads are not scheduled loads.

> "The NER does allow part of a load to be offered as a market ancillary service"[11].

However NER 2.3.5(a) does not appear to contemplate the subdivision of market loads for the provision of ancillary services:

> "If the *Market Customer* in respect of a *market load* wishes to use that *market load* to provide *market ancillary services* in accordance with Chapter 3, then the *Market Customer* must apply to *NEMMCO* for approval to classify the *market load* as an *ancillary service load*."

> "NEMMCO's registration process is likely to prevent only part of a load being classified as a market ancillary services load-each dispatchable unit would be required to have its own metering."[12]

Note that the services required of providers to these markets are the ability to vary load (or generation) in response to frequency or a telemetered signal from NEMMCO. For example, where a market load is able to do this but not reduce its consumption to zero, it is still eligible to become an ancillary services load and provide ancillary services from the variable part of its consumption.

1.3.2. Quantised Loads providing FCAS

---

[9] "To this point in the NEM's history, Victorian smelters are the only loads that have participated in the FCAS Markets."CRA Pg. 11

[10] "…onerous administrative requirements to be registered/classified as a scheduled load", CRA: Pg 15 in reference to barriers to DSP participating in market ancillary services

[11] CRA: Pg 13

[12] CRA: Pg 13

CRA has raised a concern that loads which have a quantised or "Integer" component will be ineligible for the provision of FCAS contingency services because it is enabled linearly and has suggested that these loads, when part-enabled, be permitted to over-provide the services upon the occurrence of a contingency.[13]

NEMMCO can advise that this approach is already taken for ancillary services generators and ancillary services loads. Many loads and generators respond to frequency contingency events to a volume greater than what they were required to provide as dispatched by NEMDE. Many providers do not have the technology to vary their provision in real-time, and simply continuously provide their maximum response. For example, Volume 2 of our incident report into the contingency on 28 February 2008[14] includes tables of frequency responses from enabled and non-enabled market ancillary services providers.

1.3.3. Aggregated Market Ancillary Services Loads

"Load aggregation challenges similar to those applying to scheduled loads are also likely to apply to market ancillary services load."[15]

This conflicts with NEMMCO's expectations. FCAS is dispatched either globally or regionally, and network constraints and loss factors are not applied. Aggregation of market ancillary services loads within a region should be more technically practical than scheduled load. However unlike scheduled load, this is not permitted by the NER. Clause 3.8.3(a) states:

"Scheduled Generators or *Market Participants* who wish to aggregate their *scheduled generating units*, *scheduled network services* or *scheduled loads* for the purpose of *central dispatch* and *settlements* must apply to *NEMMCO* to do so."

The rules appear to only permit a load to aggregate its market ancillary services where it is being produced from scheduled loads that have been aggregated. This would appear to effectively prohibit them, in fact NEMMCO has had to reject an application to aggregate an ancillary services load. A rule change suggestion to rectify this issue is suggested below in section 3.

1.4. DSP to Enhance the Value of Spot Market Trading/Assist in the Management of Network Loading

As mentioned by CRA, NEMMCO is currently undertaking a review of Network Support and Controls Services (NSCS). Matters regarding clarity of the boundary of responsibilities between NEMMCO and NSP's are a key issue in that review.

1.5. DSP for System Reliability

1.5.1. Rule provisions precluding the combination of DSP-derived revenues

"All effort should be taken in the development of the remuneration regime for RERT to ensure that services procured under RERT are in fact *in addition* to

---

[13] CRA: Pg 12, 13, 79
[14] http://www.nemmco.com.au/opreports/232-0097.pdf
[15] CRA: Pg 13

services that would otherwise be made available to standard market mechanisms."[16]

NEMMCO understands this to be a requirement of Rule 3.20.3(h) and (j).

"Provisions of the Rules that preclude the combination of other DSP-derived revenue with arbitrage-derived revenues, serve as a disincentive to the Facility Agent to participate in this form of DSP (and possibly other forms of DSP deployment being considered as well).[17]

Apart from the prohibition on Reserve Trader/RERT mentioned above, NEMMCO is unaware of any other "double-dipping" prohibitions in the NER.

1.6. CRA Proposals

1.6.1. Creation of a new participant category "Facility Agent"

NEMMCO notes this recommendation[18] may facilitate provision of ancillary services by DSP through an intermediary who is not also the relevant market customer (retailer) for the load. It may also be used to facilitate demand-side bidding and other interactions from a scheduled load where the retailer does not wish to do this.

To ensure that the proposal is fully considered and all potential benefits are captured, NEMMCO suggests that a technical working group develop it, including representatives of potential "Facility Agents". NEMMCO would be pleased to assist in the detailed specification.

1.6.2. Integer Programming

See discussion in section 1.2.3 above.

1.6.3. Probabalistic Ancillary Services Procurement

NEMMCO concurs that it is not normal practice to centrally procure services that have an energy market value that can not be valued and rewarded at the time of dispatch[19]. The probabilistic purchasing approach discussed implies a subtle but significant transfer of market risk from the provider to market operator. This discussion has similarities to issues raised in NEMMCO's NSCS review where it has been recognised that unlike NEMMCO, Network Service Providers commonly commit to purchasing energy market services and equipment over time, and therefore they may be better placed to perform these judgements under their existing regulatory arrangements. Rather than NEMMCO developing such a role, it may be more appropriate for Network Service Providers to be expected to procure it.

1.6.4. Wider Tolerances on Scheduled Load conformance

"Current arrangements in the Rules require tight compliance with dispatch instructions"[20]. Rule 3.8.23 vests with NEMMCO the decision as what level of

---

[16] CRA: Pg 21
[17] CRA: Pg 29
[18] CRA: Pg 76
[19] CRA: Pg 77
[20] CRA Pg 78

tolerance is permitted before a scheduled unit is flagged as non-conforming. The current arrangements were determined through consultation and are a balance between practicality and accurate dispatch and pricing and apply equally to scheduled load and scheduled generators (see section 2.3 below). CRA appear to be recommending a wider tolerance band for scheduled load and the justification for that inconsistency would need to be clarified.

Observed non-conformance can trigger the application of a non-conformance constraint until the problem is resolved. The Australian Energy Regulator is responsible for rule enforcement regarding compliance with dispatch instructions and a non-conformance notification is not necessarily a trigger to their processes.

1.6.5. Mandated DSP reporting

As noted in our initial submission, NEMMCO concurs with CRA's comments regarding the potential improvement in the accuracy of market forecasting if DSP can be incorporated. NEMMCO suggests any obligation should be developed in discussion with those likely to be subject to it and NEMMCO, to ensure the obligation is designed in a practical and valuable way.

1.6.6. DSP Uplift

CRA has discussed the concept of providing an uplift payment to scheduled load and the economic differences of such a payment to the standard energy-only approach to transacting energy in the NEM[21]. It is unclear what reward mechanism CRA are proposing, and exactly what function a scheduled load would perform to be eligible and what the payments would be. It is difficult to comment on the proposal without that level of detail.

2. Response to matters raised in Gallaugher & Associates (Gallaugher) submission

2.1. Ancillary Services Dispatch information

"NEMMCO does not publish any detailed analysis of the frequency and duration of the dispatch of historically scheduled FCAS services nor does it publish probability estimates of the likelihood of scheduled services being dispatched; i.e. a FCAS services equivalent of energy pre-dispatch."[22]

We understand the reference here is to FCAS contingency services, which are dispatched on an "enabled" basis, i.e. an FCAS provider must be ready to respond to at least the dispatched volume should a frequency contingency event occur in the current dispatch interval. Providers are paid at the current FCAS price by the volume of their dispatch, whether or not a frequency contingency actually occurs[23]. This design is consistent with the unpredictable contingent nature of the event that the service intends to address.

The NEM market systems provide full disclosure of the volumes of FCAS dispatch (i.e. enablement) in pre-dispatch timeframes and in historical data in a similar form to energy dispatch.

---

[21] CRA Pg 73
[22] Gallaugher pg 3
[23] Where an event does occur, actual performance is audited.

We understand the concern here relates not to dispatch of FCAS but rather the probability of usage, i.e. frequency contingency events, which incur a cost upon demand-side providers of FCAS. Historical information relating to frequency disturbances can be obtained from NEMMCO's monthly "Frequency and Time Deviation Monitoring in the NEM"[24] report in the Power System Operations section of the NEMMCO website.

2.2. Prudential Requirements

> "Prudential requirements in the wholesale market are a barrier to consumers participating directly in the wholesale market. They require large guarantees even if the consumer has ample hedge cover."[25]

See also our response to CRA's similar comment above in section 1.2.2.1. NEMMCO believes the concerns raised are related instead to the financial challenges of participating as a Market Customer and are incidental to the activity of demand-side participation.

In relation to such market customers requiring large prudential guarantees even if they have hedge cover, note that a Market Customer can reduce or eliminate the lodgement of collateral by entering a reallocation arrangement with a Generator whose outstanding NEM settlement credit is used in lieu of a financial guarantee. This mechanism is designed to be attractive to pairs of Generators and Market Customers who have hedging contracts in place between them.

2.3. Scheduled load compliance margins

> "Generators enjoy generous margins in terms of quantum of generation and time in the current non-compliance procedures. Arguably, demand side participants are not treated so generously. Also, the penalties for non-compliance may also act as a deterrent."[26]

NEMMCO's Non-conformance dispatch procedures apply equally to scheduled generators and scheduled load[27]. Penalties are a matter for the Australian Energy Regulator and as noted above in section 1.6.4, are not necessarily related to NEMMCO's non-conformance processes.

2.4. FCAS cost recovery

> "Current methods of FCAS cost allocation deter direct market participation by a consumer because he loses the benefits of load diversity he enjoys when supplied by a retailer."[28]

FCAS Raise contingency services are levied upon generators on a per MWh generated basis. FCAS Lower contingency services are levied upon customers on a per MWh consumed basis. The latter are therefore unaffected by a load's decision to classify as a scheduled load. These services constitute the bulk of FCAS costs, e.g. during 2007 they made up 85% of a total cost of just under $68m[29].

---

[24] E.g. http://www.nemmco.com.au/powersystemops/250-0078.pdf
[25] Gallaugher Pg. 3
[26] Gallaugher Pg. 5
[27] See http://www.nemmco.com.au/powersystemops/3705.html section 9 and appendix 5.
[28] Gallaugher, Pg. 5
[29] See http://www.nemweb.com.au/REPORTS/CURRENT/Ancillary_Services_Payments

FCAS regulation services are levied on a "causer-pays" basis which penalises observed non-conformance with dispatch targets where 4 second telemetered data exists (or a presumed dispatch trajectory for metered non-scheduled loads) and charges the residual load (typically 80% of the remaining 15%) on a per MWh basis against other loads. This process should provide a small incentive for such telemetered loads to register as scheduled as they can signal when a variation is to occur and therefore indicate a better trajectory to the causer-pays calculation.

2.5. Time limited nature of DSR Dispatch

"As dispatch of a DSR load can be disruptive to the consumer, quite often there will be some practical limits on the frequency and duration of its dispatch set by the consumer. Under current processes, the consumer cannot set such limits in the dispatch process; he must manage them manually in real time himself."[30]

As stated in our original submission, self-management of inter-temporal optimisation is an expected feature of the NEM's single pass pricing mechanism and reinforces the criticality of accurate predispatch information. As noted above in section 1.2.3, the FSIP however can be used to effectively signal a "must-run" period for scheduled load and can provide some reaction time (up to 60 minutes) for a scheduled load before a rebid is necessary.

2.6. "Market Participation Registration Requirements"

"NEMMCO's requirements of DSR service providers for them to be eligible to participate directly in the physical markets may be unduly onerous, necessitating consumer investment in an unnecessarily high level of infrastructure to facilitate real time market operations."[31]

As noted in section 1.2.1 above, NEMMCO considers these investments a technical necessity for all scheduled entities to participate in accurate dispatch and price setting and should not be characterised as an unnecessary administrative obligation.

3. Suggested Rule Changes

In reviewing the registration issues raised by CRA, NEMMCO has identified a number of minor alterations to Chapters 2 & 3 that may assist providers of DSP. It is suspected that these issues arose from unintentional drafting inconsistencies between the registration of Generators and Loads. It is NEMMCO's intention to progress these into rule change proposals.

3.1. Aggregation of Ancillary Services Loads

See the issue raised in section 1.3.3 above. "*Ancillary service loads*" appear to have been omitted from the group of classifications that may be aggregated in rule 3.8.3.

3.2. Scheduled/Non-Market Loads

The rules enable Generators to register as scheduled non-market Generators and the NEM includes several examples where generators are dispatched but not settled by

---

[30] Gallaugher, Pg. 3
[31] Gallaugher, Pg. 5

NEMMCO. This is however prohibited for Loads in 2.3.4(d) as a scheduled load must first be a market load. This could be a material barrier to participation as a market load must therefore not be a customer of the host retailer (rule 2.3.4(a)).

> "2.3.4(d) A *Market Customer* may request *NEMMCO* to classify any of its *market loads* as a *scheduled load.*"

3.3. Ancillary Services Loads must be Market Loads

A similar barrier applies to ancillary services loads in 2.3.5(a)

> "If the *Market Customer* in respect of a market load wishes to use that *market load* to provide *market* ancillary services in accordance with Chapter 3, then the *Market Customer* must apply to NEMMCO for approval to classify the market load as an ancillary service load."

The same issue appears to apply to non-market generating units in 2.2.6.(a).