



Hydro Tasmania
the renewable energy business

3 April 2007

Dr John Tamblyn
Chairman
Australian Energy Market Commission
PO Box H166
AUSTRALIA SQUARE NSW 1215

Emailed: submissions@aemc.gov.au

Dear John,

Dispatch of Scheduled Network Services

Hydro Tasmania, as the proponent of this Rule change proposal, is making this submission to clarify and expand on points raised in our proposal. In discussion with your officers, it has become apparent that some further explanation would assist your commission in its consideration of this matter.

This submission does not alter the proposal, or the grounds for urging its adoption.

1. The effects of the current dispatch implementation

In our initial proposal, we deliberately gave only a brief outline of the details of the current dispatch process that have led to Basslink dispatch contrary to its market offer.

We chose this path because the point at issue is the high level requirement for market dispatch to be based on market offers and bids. In our view, the detailed implementation must serve the high level principles, not subvert them (however accidentally). We therefore avoided cluttering the proposal with the complex detail of the implementation that have produced the outcomes contrary to the principles specified in the Rules.

However, we would be pleased to provide whatever detail your Commission finds useful in your deliberations, and will seek to satisfy your needs here.

The dispatch process was required to deal with new and difficult issues with the advent of Basslink. The main issues contributing to the difficulties are as follows –

- The technology of Basslink creates a “no-go” zone of power flow, within which continued operation is not possible. Within a range of approximately +50 MW to -50 MW, only zero flow can be sustained. This is clearly a non-linear characteristic, and hence not easily integrated into the linear programming technique used in the NEM dispatch. This has led to NEMMCO using different sets of constraint equations in relation to Basslink at different times depending on, inter alia, measured flow and prior dispatched flow. This is an adaptation to deal with an issue that is not a natural fit to the current dispatch technology, and the need for this adaptation has brought unforeseen consequences.
- Basslink is the first Scheduled Network Service Provider in the NEM to have a frequency-sensitive control system. This allows the transfer of Frequency Control Ancillary Services (FCAS) across the facility, allowing competition in FCAS provision to extend to Tasmania, and also enhancing the physical behaviour of the network. The National Electricity Rules make no provision for transport of FCAS as a service rewarded by the market, but the market dispatch process does, and should, recognise the benefits of such transport. Much of the complexity of constraint equations in relation to Basslink relates to the recognition of this (unpaid) service to the market.
- The technology of a direct-current link, such as Basslink, unlike the more common alternating-current technology, creates limits on FCAS transport as a function of the dispatched flow in relation to flow limits (which include availability limits and the boundaries of the “no-go” zone). These relationships create competing tensions on the dispatched flow for Basslink arising from the energy market on one hand, and the various FCAS markets on the other.

These complexities led NEMMCO to a complex process involving numerous constraint equations in dispatch, groups of which are applied or rendered ineffective in response to circumstances. Unfortunately, in dealing with these complex and difficult issues, NEMMCO inadvertently created a process which, at times, dispatches Basslink for a service which was not offered to the market. This is a dispatched flow of energy when the price difference that is specified by the offer is not present.

A more detailed description of how this result has arisen is given in Appendix A.

2. The adverse effects of current dispatch practice on the NEM objective

In our proposal, we described the adverse effects of the current dispatch process on the incentives for market entry by Scheduled Network Service

Providers, on breaches of system security requirements, and on competition in the energy market between mainland and Tasmanian suppliers.

In addition, and not previously identified, this dispatch process has forced Hydro Tasmania to adopt risk mitigation strategies to manage risks arising from the defect in the dispatch process, which limits our opportunity to compete in the energy market. We contend that any such artificial limitation on competition is contrary to the market objective.

3. Illustration of the effect of dispatch of Basslink in accordance with its offer

Under the current dispatch process, a situation that has been observed, as one example, is described in general terms as follows.

- Basslink is dispatched to a moderate southerly flow despite energy prices favouring a northerly flow (ie dispatched contrary to its offer),
- This results from high mainland raise service (FCAS) prices, which favour more southerly Basslink flow to allow Tasmanian raise services to satisfy mainland needs,
- This situation is likely to continue over substantial time periods because of a stable balance between the competing tensions arising from the energy market on one hand, and FCAS markets on the other.

If, in accordance with our proposal, the dispatch of Basslink were required to be in accordance with its offer, then -

- The first dispatch outcome with counter-price flow dispatched on Basslink would be discarded in favour of a dispatch with FCAS transport over Basslink excluded,
- This would initially result in some higher FCAS prices on the mainland as supply from Tasmania was prevented,
- It would also result in a reduced difference in energy market prices as competition in energy would not be restricted by the competing influence of FCAS,
- This would lead to a more northerly flow on Basslink, with the likely outcome being a reversal of the Basslink flow direction over two dispatch intervals,
- With a flow reversal, the limitation on FCAS transport that applied prior to reversal will no longer apply. Unless a limitation in the converse FCAS transport was to intervene, the dispatch process could resume allowing FCAS transport following a flow reversal.

In summary, the energy market (which comprises about 99.5% of value transacted in the NEM) would be more competitive. The FCAS markets (which comprise in aggregate about 0.5% of the value transacted in the NEM)

would suffer some loss of competition, but this loss would generally be brief and followed by unrestricted competition (unlike the continuing restricted competition that the current process is liable to produce through dispatch outcomes trapped by trade-offs between energy and FCAS markets). This means that a more efficient outcome would result when viewed over several dispatch intervals.

4. The materiality of the risk of dispatch of Basslink contrary to its offer

In the attachment to our proposal, we indicated the materiality of the issue by describing the fraction of time that dispatch of Basslink was contrary to its offer (39% over 3½ months). We now add that the subtraction from Basslink revenue as a result was about \$1.09 million over this same period.

Since then the materiality of the issue, by this measure, would appear to have diminished. However, this is largely because Hydro Tasmania has acted to protect itself from various risks arising from the current dispatch process for Basslink.

This risk mitigation strategy also involves necessary departures from the efficient use of stored water for generation, thus diminishing the market value of this resource and increasing the overall cost of electricity supply. This is a particularly unfortunate outcome during the current drought.

The need for Hydro Tasmania to plan these responses on the basis of market forecasts and the consequent risk of error, compounds the inefficiency.

One of the aims of this risk mitigation strategy is to minimise the times at which dispatch of Basslink contrary to its offer will occur and hence the previous measure of materiality now has little relevance.

However, the frequent use by Hydro Tasmania of generator offer changes to influence Basslink reversals will be apparent to your Commission through publicly available market data and will indicate the ongoing materiality of the issue.

We maintain that the materiality of the issue has remained substantial; but has altered in its form as a result, in particular, of risk mitigation strategies which have other adverse effects in the market.

5. Impact of this change on Basslink Value

In our submission we mentioned that the cost to Basslink of dispatch contrary to its offer is passed on to Hydro Tasmania under a "Basslink Services Agreement". We will amplify that statement here to better inform your Commission on where this risk lies.

The Basslink Services Agreement is a 25-year agreement with about 24 years to run.

Under the terms of this agreement, the volatile market revenue resulting from the provision of energy transport services is passed to Hydro Tasmania in return for an essentially fixed fee.

This fee has no direct connection with Basslink flows, or the market price differences in relation to those flows, which are the subject of our proposal.

This fee is subject to variations in relation to Basslink availability (which this proposal will not effect) and also a risk-sharing element which is related to Victorian market prices. Since counter price flows only occur at low Basslink flows, the potential for this change to affect Victorian prices is very limited.

It is therefore clear that changing the dispatch process as we have proposed will not have any material effect on the financial position of the current owners, National Grid Australia, or any subsequent owners over the long period that is the remaining term of the agreement.

In this submission we have sought to provide all the further information that we understand to be useful to your Commission. If you have any further need for clarification that we have not addressed, we would be pleased to provide further information. I can be contacted at david.bowker@hydro.com.au or on 03-62305775.

Yours sincerely,

A handwritten signature in dark ink, reading "D. Bowker." with a horizontal line underneath the name.

David Bowker
Manager Regulatory Affairs

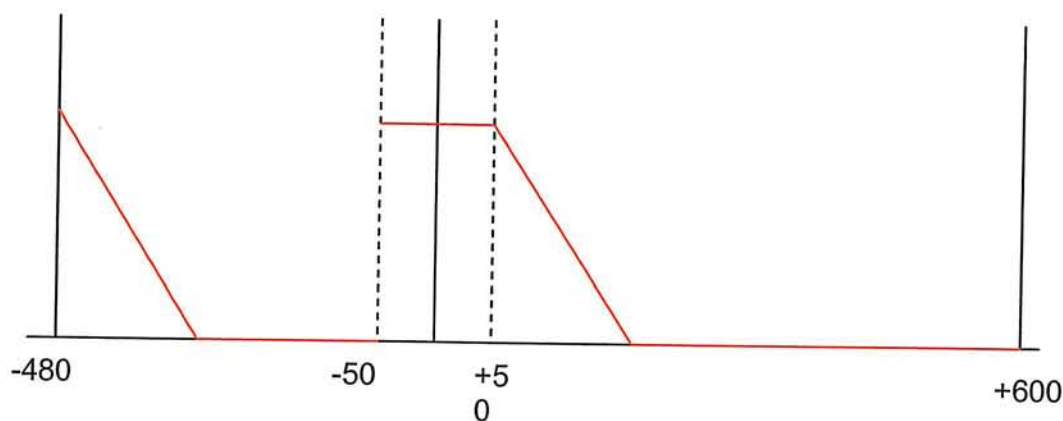
Appendix A

The effects of the current dispatch implementation (further detail)

The ability of Basslink to transport FCAS reduces as the dispatched flow approaches one of the flow limits, either an availability limit or a boundary of the no-go zone. The variation in transport ability is expressed as a variation in a local FCAS requirement at that end of Basslink towards which transport of FCAS is limited. This varies with the type of service (raise or lower) and the flow limit that is relevant.

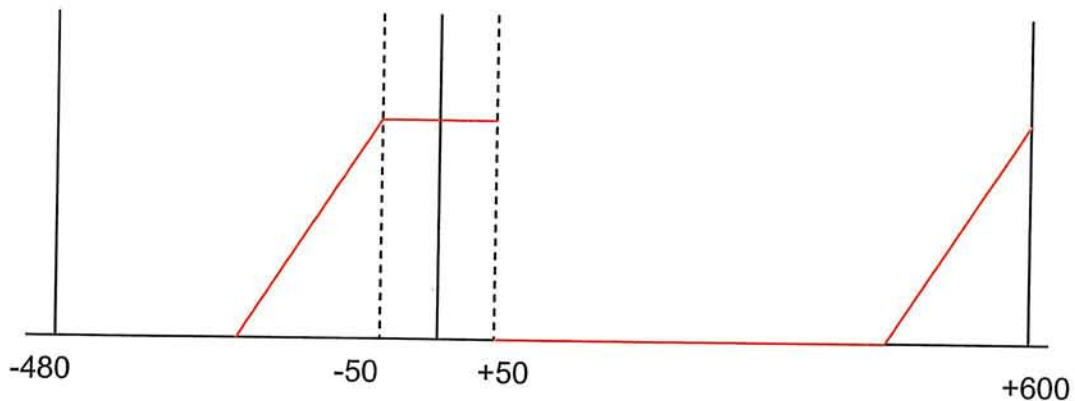
The variation of these local requirements with Basslink flow is illustrated below.

Variation of local FCAS requirements



Variation of -- A Tasmanian Raise service, or
-- A Mainland Lower service

Variation of local FCAS requirements

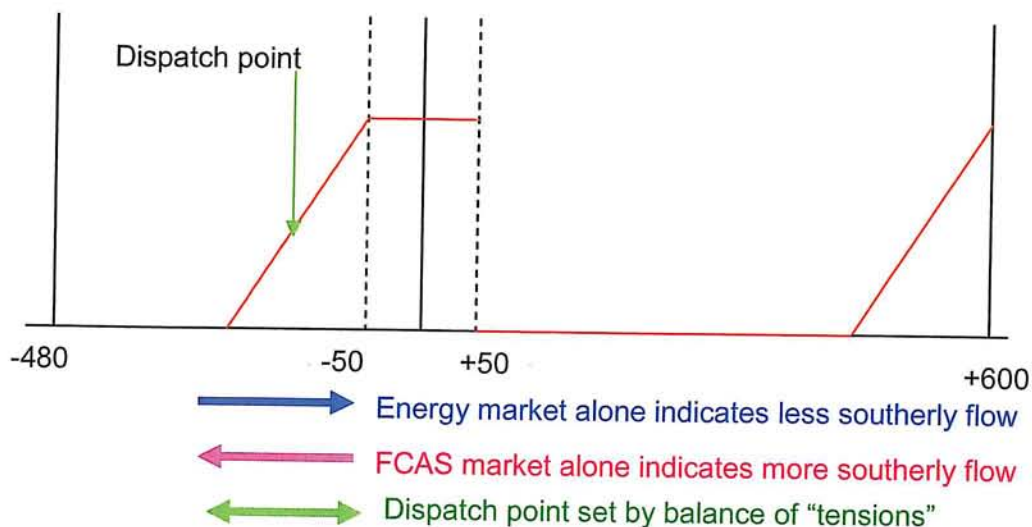


Variation of -- A Tasmanian Lower service, or
-- A Mainland Raise service

The variation in these local requirements near the no-go zone has led to dispatch of Basslink contrary to its offer. This is because the market incentives on energy flow (where the Basslink offer resides) can, in this formulation, be countered by incentives arising from the FCAS markets (where Basslink has no offer and no financial interest).

This dispatch outcome is illustrated as follows.

Effect on Dispatch - example



The incentive for Basslink flow further from the no-go zone and hence with lower local requirements, arises from two causes.

- The reduced local requirement may allow enablement of lower cost suppliers of some FCAS requirements, or
- The total quantity of an FCAS may vary with the local requirement, where the quantity at one end of Basslink is already fixed by a local requirement that is independent of Basslink flow.

In this formulation of the admittedly complex task of dispatching Basslink has some important consequences.

- In dealing with the non-linearity of the Basslink characteristics, the formulation has limited the range of dispatch solutions that are considered and this may sometimes lead to sub-optimal dispatch even within its own terms. This issue is the reason for the current NEMMCO proposal to change Basslink dispatch.
- More importantly in the context of this proposal, this formulation contains no mechanism to ensure that Basslink is dispatched in accordance with its offer, as required by clause 3.8.1 (a).

The resolution of either issue requires a significant change to the dispatch process, most likely in the form of a second dispatch run excluding FCAS transport. This formulation is now proposed by NEMMCO to deal with the first consequence, but could be simply modified to deal with both.