Spot prices greater than $5000/MWh

AUSTRALIAN ENERGY REGULATOR

Tasmania 23 May 2006

Introduction

The AER is required to publish a report whenever the spot price exceeds $5000/MWh, pursuant to clause 3.13.7 (d) of the Rules. That report should:

- describe significant factors contributing to the spot price exceeding $5000/MWh, including withdrawal of generation capacity and network availability;
- assess whether rebidding pursuant to clause 3.8.22 contributed to the spot price exceeding $5000/MWh;
- identify the marginal scheduled generating units; and
- identify all units with offers for the trading interval equal to or greater than $5000/MWh and compare these dispatch offers to relevant dispatch offers in previous trading intervals.

Background

The report examines the factors that can contribute to the spot price exceeding $5000/MWh including: changes in demand compared to that forecast by NEMMCO; the impacts of the frequency control ancillary service markets; generator offers and rebidding, including changes to generation capacity; and changes to network availability.

NEMMCO produce a forecast of market conditions for each 30-minute trading interval of the trading day, including forecast price. These forecasts are based on information compiled by NEMMCO and submitted by participants. The first forecast, or predispatch run, for a trading day is prepared at around 1 pm the previous day and is updated every half hour, taking into account: changes in demand; network capability; and participant rebids. The accuracy and timeliness of this information is critical to allow participants to make informed commercial decisions based on the best information available at the time.

The report focuses on two forecasting horizons, namely 4 and 12 hours ahead of dispatch and endeavours to compare and explain actual outcomes with reference to these timeframes.

Summary

On Tuesday 23 May, the spot price for energy in Tasmania reached $6509/MWh for the 8 am trading interval. This resulted from a number of 5-minute dispatch prices of $10 000/MWh from 7.25 am. At the same time, high ancillary service prices occurred in Tasmania. The requirement for some of these services was at times not met as a result of insufficient availability of these services in Tasmania. These shortages lasted until 7.50 am and were reflected into the energy market price[1]. The interaction between the Basslink no-go zone and the Frequency Control Ancillary Service (FCAS) markets led to counter price flows into Victoria. These outcomes were reflected in the five-minute predispatch system from 6.45 am but were not forecast in the 30-minute predispatch system.

At 7.50 am, NEMMCO directed National Grid to make Basslink available for flows from Victoria to Tasmania. Over the next few dispatch intervals, varying flows into and out of Tasmania and the frequency response of some generators saw 230 MW of generation at Butlers Gorge, Bastyan, Gordon and Wayatinah trip in quick succession. This led to around 240 MW of industrial load being shed.

NEMMCO published a power system incident report on 14 September 2006 and a Market Report on 18 September. The AER is currently reviewing the results of those reports with respect to the Rules.

Actual and forecast demand

NEMMCO is responsible for forecasting demand, which is input to the dispatch process. Changes between forecast and actual demand can have significant impacts on market outcomes. An increase in demand tends to push generation dispatch further up the supply curve leading to an increase in price.

Actual demand was 92 MW or six per cent higher than forecast four hours ahead. Taking into account non-scheduled generation, which was 80 MW higher than forecast, the demand was 172 MW or 10 per cent higher on the same basis. Figure 1 compares the actual demand in Tasmania with that forecast by NEMMCO four and 12 hours ahead of dispatch. A comparison of actual and forecast spot price is also included.

Figure 1: Actual and forecast demand and spot price in Tasmania

Tuesday 8:00 am	Actual	4 hr forecast	12 hr forecast
Demand (MW)	1593	1501	1489
Non-scheduled generation[2] (MW)	95	15	30
Native demand (MW)	1688	1516	1519
Spot price ($MW/h)	6509.09	26.64	25.24

1 Refer http://www.nemmco.com.au/dispatchandpricing/160-0041.htm for details on co-optimisation.

2 Non-scheduled generation represents wind generators which can offset demand but are not scheduled by NEMMCO.

Generator offers and rebidding.

At 6.04 am, Hydro Tasmania reduced the available capacity at Reece unit one by 114 MW. The rebid reason given was "Plant outage::Reece 1". Most of this capacity was priced below $15/MWh. At the same time, Hydro Tasmania rebid 114 MW of capacity across the rest of its portfolio into prices of less than $30/MWh. Following this rebid, all of the capacity in Tasmania was priced at less than $30/MWh, apart from 4 MW at Fisher priced at $8000/MWh. This offer from Fisher was a significant contributor to the $10 000/MWh energy prices in a number of dispatch intervals.

At 7.04 am, Hydro Tasmania rebid all of its capacity in the raise contingency ancillary services market from prices of less than $20/MW to $80/MW. The rebid reason given was "Co-optimisation of energy and FCAS". This rebid had no impact on the forecast price of these services in Tasmania.

Figure 2 shows, for the trading interval ending 8 am, the total capacity available in Tasmania based on generator offers. The figure compares actual capacity with that forecast 4 and 12 hours ahead of dispatch. The change in the amount of capacity offered at prices less than the forecast price of $26.64/MWh, calculated four hours ahead of dispatch, is also included. This highlights the changes to the supply curve that contributed to changes in the price forecast.

Figure 2: Actual and forecast capacity and spot price

Tuesday 8:00 am	Actual	4 hr forecast	12 hr forecast
Capacity (MW)			
available	1671	1785	1785
priced at less than $26.64	1660	1766	…
Spot price ($/MWh)	6509.09	26.64	…

The scheduled generators involved in setting the spot prices during the trading interval ending 8 am, where the price in Tasmania reached $6509/MWh, and how those prices were determined by the market systems are detailed in **Appendix A**.

The closing offers for Hydro Tasmania, including the amount of capacity priced at or above $5000/MWh during this period, are provided in **Appendix B**.

Changes to network availability

Changes to the availability of the network can have significant impacts on market outcomes. These changes may be the result of planned network outages or as a result of the unplanned failure of equipment. Network outages are modelled in the market systems to reflect the expected capability of the network. Modelling errors can result in significant differences between the forecast capability of the network and the actual capability.

The Basslink interconnector is technically incapable of transitioning from northward to southward flows (or vice-versa) instantly. This restriction is implemented in the market systems through the concept of a no-go zone between +/-50MW. This holds the interconnector at 50 MW (in either direction) for one dispatch interval prior to a transition from one direction to another. Basslink is also prevented from transferring frequency control ancillary services while in the no-go zone. As a result, moving towards the no-go zone, ahead of a transition from northward to southward flows, leads to an increase in the requirement for locally sourced raise frequency control ancillary services in Tasmania, which can reduce the availability of generation in the energy market in that region. Once through the no-go zone, however, Basslink can again transfer frequency control ancillary services from the mainland.

The no-go zone is not modelled in the 30 minute predispatch forecast system because it is a sub 5-minute issue. As a result, the limit on flow into Tasmania was forecast to be around 300 MW, both four and 12 hours ahead. During dispatch, however, the no-go zone and its interactions with the frequency markets kept flows north and counter-priced into Victoria for much of the trading interval.

Frequency control ancillary service (FCAS) outcomes

Frequency control ancillary services are required to maintain the power system frequency within the standard. These services are offered into the market systems by registered providers (usually generators) along with energy market offers from the same provider. The dispatch algorithm optimises the dispatch of energy and ancillary services subject to the provider's capability to simultaneously provide those services. These interactions can lead to significant impacts in any number of those markets, including leading to pricing and dispatch outcomes that were not forecast.

Generating units in Tasmania were at or near full capacity during the morning. A number of units were either stranded or trapped[3] in the ancillary service markets and could not supply FCAS and/or energy market services to Tasmania. This led to insufficient raise 5 minute, raise 6 second and raise regulation services in Tasmania. Six FCAS constraints were violated during the trading interval. The price for the raise 5-minute and regulation services reached $8000/MW for four dispatch intervals while the price for the raise 6 second service reached $6000/MW for three dispatch intervals.

The interaction of the frequency markets and Basslink, which led to the extreme counter-priced flows, was first forecast at 6.45 am in the 5-minute predispatch forecast system. This forecast showed shortages for the raise 6 second service from 7.25 am. The interaction between the frequency and energy markets, and Basslink are explained in more detail in **Appendix C**.

Figure 3 shows the price, availability and requirement for the raise services in Tasmania during each dispatch interval in the trading interval ending 8 am. The table also highlights the periods where the requirement was not met.

[3] If a generator is flagged as stranded then its initial MW is outside of its ancillary service enablement limits and the unit is unavailable for FCAS. If a generator is flagged as trapped then its energy target is at an ancillary service enablement limit, which restricts its movement in the energy market.

Figure 3: Price, availability and requirement for raise ancillary services

	Raise 5 minute			Raise 6 second			Raise Regulation		
	Price ($/MW)	**Avail (MW)**	**Req (MW)**	**Price ($/MW)**	**Avail (MW)**	**Req (MW)**	**Price ($/MW)**	**Avail (MW)**	**Req (MW)**
7:35 *	8079.23	90.00	**90.93**	6061.85	22.39	**24.78**	8001.23	0.00	**26.07**
7:40 *	8014.83	89.00	**119.69**	6061.85	22.39	**32.67**	7936.83	0.00	**34.92**
7:45 *	8014.22	90.00	**124.97**	6061.85	22.39	**37.70**	7936.22	0.00	**42.35**
7:50	80.00	88.00	**133.08**	80.00	17.72	**45.31**	0.95	0.00	**50.00**
7:55	1081.47	132.29	132.29	84.88	44.49	44.49	1004.47	50.00	50.00
8:00	81.08	69.63	69.63	80.00	33.24	33.24	8.68	50.00	50.00

* Times when energy and FCAS were being co-optimised

Figure 4 compares the actual Basslink interconnector limits and flow with those forecast 4 and 12 hours ahead of dispatch for the 8 am trading interval. This shows flows were forced into Victoria.

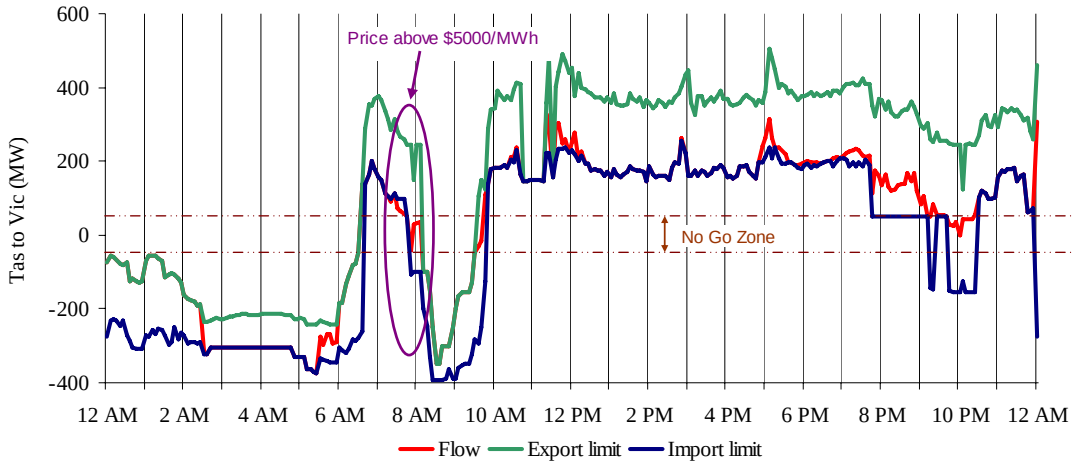
Figure 4: Tasmania to Victoria interconnector actual and forecast flows and limits

Tuesday 8:00 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Basslink import limit *	24	-297	-319
Basslink flow *	39	86	29
Basslink export limit*	241	360	275

***** By convention, positive flows are in the direction Tasmania to Victoria. The import limit is normally negative while the export limits is normally positive. At times, however, both import and export limits have the same sign.

Figure 5 shows the five minute flow and limits on Basslink on the day. The period where the spot price was greater than $5000/MWh is highlighted.

Figure 5: Basslink flows including import and export limits



Assessment

The energy spot price reached $6509/MWh during the trading interval ending 8 am on 23 May. At the time, demand was significantly higher than forecast and available generation was lower than forecast leading to relatively tight supplies in Tasmania.

From 6.15 am, the price in Tasmania was lower than for Victoria, which saw Basslink change direction at 6.40 am and export to Victoria. The interaction of the energy and frequency control ancillary service markets with the operation of Basslink led to continued northwards flows across Basslink, which were counter-priced from 7.10 am. These continuing exports exacerbated the tight supply for energy and ancillary services in Tasmania and led to a number of $10 000/MWh prices from 7.25 am. Rebidding did not contribute to the high prices in the energy or frequency markets.

Following these high prices, 230 MW of generation at Butlers Gorge, Bastyan, Gordon and Wayatinah tripped in quick succession and 240 MW of load was shed. The AER is reviewing the power system incident and market reports published by NEMMCO on 14 and 18 September 2006 respectively to ensure that participants complied with the Rules.

Australian Energy Regulator
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The following table identifies for the trading interval ending 8 am (in which the spot price exceeded $5000/MWh), each five minute dispatch interval price and the generating units, as published in the market systems, involved in setting the energy price. This information is published by NEMMCO[4]. Also shown is the energy or ancillary service offer price involved in determining the dispatch price together with the quantity and the contribution of that service to the total energy price. Dispatch prices greater than $10 000/MWh are capped. The 30-minute spot price is the time weighted average of the six dispatch interval prices.

Thursday 23 May – Tasmania 8.00 am

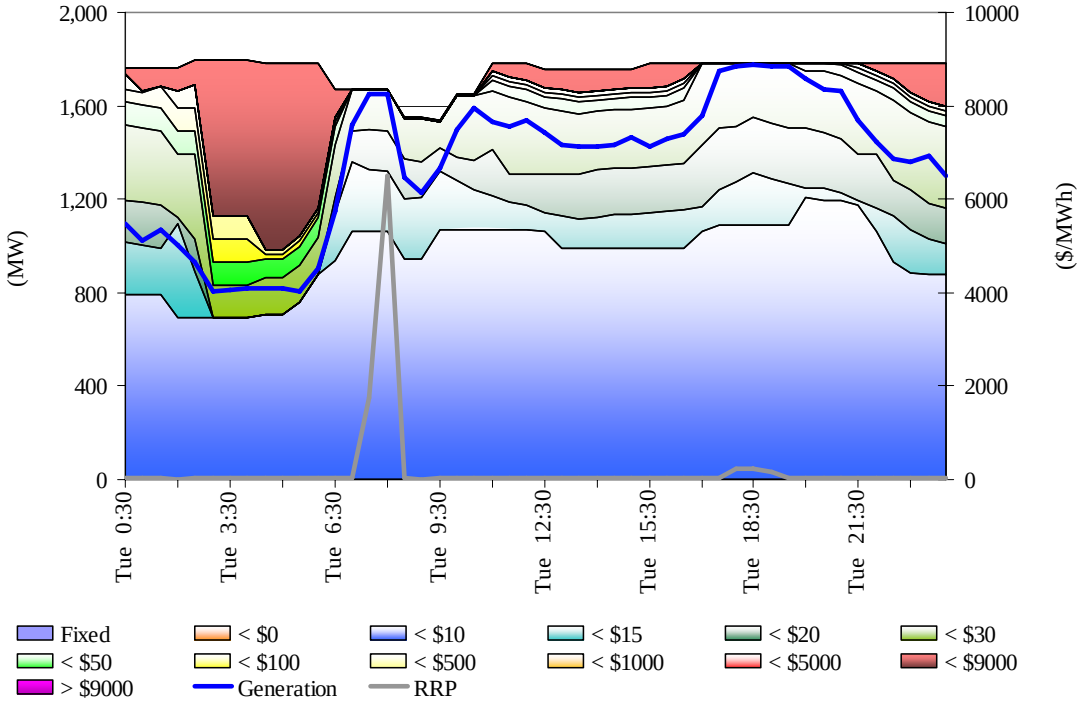
Time	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer ($/MWh)	Marginal Change	Portion ($/MWh)
07:35	10000.00 (capped)	Hydro Tas.	FISHER	Energy	8000.00	2.78	22267.49
			MEADOWBK	Energy	24.20	-0.76	-18.37
			MEADOWBK	Lower 5 min	5.00	-0.76	-3.80
			TUNGATIN	Lower 5 min	5.00	0.76	3.80
			FISHER	Lower 6 sec	5.00	-8.35	-41.75
			GORDON	Lower 6 sec	5.00	8.35	41.75
			GORDON	Lower reg	0.20	1.01	0.20
			FISHER	Raise 5 min	80.00	-2.78	-222.67
			MEADOWBK	Raise 5 min	80.00	0.76	60.73
			REECE2	Raise 5 min	80.00	1.01	80.97
			FISHER	Raise 6 sec	80.00	-2.78	-222.67
			MEADOWBK	Raise 6 sec	80.00	1.77	141.70
			FISHER	Raise 60 sec	80.00	-6.21	-496.74
			MEADOWBK	Raise 60 sec	80.00	1.34	106.80
			TRIBUTE	Raise 60 sec	80.00	3.86	308.96
			REECE2	Raise reg	2.00	-1.01	-2.02
		TRUEnergy	TORRB3	Energy	30.70	-0.30	-9.32
			TORRB4	Energy	30.70	-0.30	-9.32
			TORRB2	Energy	30.70	-0.30	-9.32
			TORRB3	Lower reg	1.00	-1.01	-1.01
			TORRB4	Raise 6 sec	0.50	1.01	0.51
		National Grid	Basslink	Energy	0.01	1.01	0.01
		Snowy Hydro	UPPTUMUT	Raise reg	5.50	1.01	5.57
		Tarong	TARONG#1	Lower 5 min	0.50	-1.01	-0.51
		Macquarie Gen.	BW04	Raise 5 min	0.04	1.01	0.04
		TRUEnergy	YWPS4	Raise 60 sec	0.05	1.01	0.05
07:40	10000.00 (capped)	Hydro Tas.	FISHER	Energy	8000.00	2.78	22205.01
			MEADOWBK	Energy	24.20	-0.76	-18.32
			MEADOWBK	Lower 5 min	5.00	-0.76	-3.78
			REECE2	Lower 5 min	5.00	0.76	3.78
			FISHER	Lower 6 sec	5.00	-8.33	-41.63
			TRIBUTE	Lower 6 sec	5.00	8.33	41.63
			GORDON	Lower reg	0.20	1.01	0.20
			FISHER	Raise 5 min	80.00	-2.78	-222.05
			GORDON	Raise 5 min	80.00	1.01	80.75
			MEADOWBK	Raise 5 min	80.00	0.76	60.56
			FISHER	Raise 6 sec	80.00	-2.78	-222.05
			MEADOWBK	Raise 6 sec	80.00	1.77	141.30
			REECE2	Raise 60 sec	80.00	-1.01	-80.75
			GORDON	Raise reg	2.00	-1.01	-2.02
		AGL Hydro	MCKAY2	Energy	35.70	0.09	3.10

[4] NEMMCO first published details on how the price is determined, for every dispatch interval, in June 2004. Documentation of this process can be found at http://www.nemmco.com.au/dispatchandpricing/140-0036.htm

Time	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer ($/MWh)	Marginal Change	Portion ($/MWh)
07:40		TRUEnergy	TORRB4	Energy	30.70	-1.01	-30.99
(cont)			TORRB3	Raise 6 sec	0.50	1.01	0.50
			TORRB4	Raise reg	2.50	1.01	2.52
		National Grid	Basslink	Energy	0.01	1.01	0.01
		TRUEnergy	YWPS3	Lower 5 min	0.19	-1.01	-0.19
			YWPS4	Raise 60 sec	0.05	1.01	0.05
		Enertrade	GSTONE5	Lower reg	1.00	-1.01	-1.01
		Macquarie Gen.	BW04	Raise 5 min	0.04	1.01	0.04
07:45	10000.00	Hydro Tas.	FISHER	Energy	8000.00	2.78	22205.01
	(capped)		MEADOWBK	Energy	24.20	-0.76	-18.32
			FISHER	Lower 6 sec	5.00	-8.33	-41.63
			LEM_WIL	Lower 6 sec	5.00	8.33	41.63
			FISHER	Lower60 sec	2.00	-33.31	-66.62
			GORDON	Lower60 sec	2.00	33.31	66.62
			GORDON	Lower reg	0.20	1.01	0.20
			FISHER	Raise 5 min	80.00	-2.78	-222.05
			GORDON	Raise 5 min	80.00	1.01	80.75
			MEADOWBK	Raise 5 min	80.00	0.76	60.56
			FISHER	Raise 6 sec	80.00	-2.78	-222.05
			MEADOWBK	Raise 6 sec	80.00	1.77	141.30
			GORDON	Raise 60 sec	80.00	-1.01	-80.75
			GORDON	Raise reg	2.00	-1.01	-2.02
		TRUEnergy	TORRB4	Energy	30.70	-1.01	-30.99
			TORRB3	Lower reg	1.00	-1.01	-1.01
			TORRB2	Raise 60 sec	0.05	1.01	0.05
			TORRB4	Raise reg	1.60	1.01	1.61
		National Grid	Basslink	Energy	0.01	1.01	0.01
		AGL Hydro	MCKAY1	Energy	38.20	0.09	3.31
		LYMMCO	LYA3	Raise 6 sec	0.50	1.01	0.50
		Eraring Energy	ER04	Lower 5 min	0.10	-1.01	-0.10
		Macquarie Gen.	BW04	Raise 5 min	0.04	1.01	0.04
07:50	8000.00	Hydro Tas.	FISHER	Energy	8000.00	1.00	8000.00
07:55	1025.67	Int. Power	LOYYB1	Energy	1038.01	0.98	1018.91
			LOYYB1	Raise 5 min	0.51	-0.98	-0.50
			LOYYB1	Raise 6 sec	0.00	-0.98	0.00
			LOYYB1	Raise 60 sec	0.00	-0.98	0.00
		Enertrade	GSTONE1	Raise 5 min	5.00	0.98	4.91
		Snowy Hydro	MURRAY	Raise 6 sec	2.00	0.98	1.96
		LYMMCO	LYA4	Raise 60 sec	0.40	0.98	0.39
		National Grid	Basslink	Energy	0.00	1.00	0.00
08:00	28.88	Snowy Hydro	TUMUT3	Energy	27.64	1.05	28.89
		National Grid	Basslink	Energy	0.01	-1.00	-0.01
Spot price	**6509.09**						

The AER is required to identify all units with offers for the trading interval equal to or greater than $5000/MWh and compare these dispatch offers to relevant dispatch offers in previous trading intervals. Figure B1 presents the half hour closing bids for Hydro Tasmania throughout 23 May 2006. It includes the capacity priced at or above $5000/MWh during the 8am trading interval when the spot price reached $6509.09/MWh. On this occasion, there was only 4MW of capacity in Tasmania priced at greater than $5000/MWh. The amount of dispatched generation and the spot price in Tasmania is also included.

Figure B1: Hydro Tasmania closing bid prices, dispatch and region price.



High Tasmania price and counter price flows across Basslink

This section provides an explanation of the events of 23 May 2006, and the interaction between the frequency control ancillary service and energy markets, and Basslink.

The Basslink interconnector is technically incapable of transitioning from northward to southward flows (or vice-versa) instantly. This restriction is managed in the market systems through the concept of a no-go zone between +/-50MW. This holds the interconnector at 50 MW (in either direction) for one dispatch interval. The interconnector is also prevented from transferring frequency control ancillary services while in the no-go zone. As a result, when moving towards the no-go zone, ahead of a transition from northward to southward flows, an increase in the requirement for locally sourced raise frequency control ancillary services in Tasmania, can reduce the availability of generation in the energy market in that region. This can lead to an increase in the prices for energy and ancillary services. Once through the no-go zone, however, Basslink can again transfer frequency control ancillary services from the mainland.

NEMMCO uses a dispatch algorithm (NEMDE) that optimises flows across Basslink with the requirement for energy and frequency control services. This facilitates the trading of frequency services between the mainland and Tasmania. The discontinuity caused by the no-go zone can cause perverse outcomes.

During the morning of 23 May 2006, energy flows across Basslink were north into Victoria. From 7.25 am, Basslink was also transferring raise frequency services south into Tasmania. This transfer is given effect by the following general constraint formulation:

Tasmanian FCAS dispatch + Basslink flow >= the FCAS requirement.

This formulation leads to the scenario where, to satisfy the FCAS requirement, a decrease in Basslink northerly flow of 1 MW, results in an increase by 1 MW in the level of frequency service requirement in Tasmania. Where there are as many as three frequency markets affecting Basslink, as there were on 23 May, a 1 MW increase is counted three times, once for each of the three ancillary service markets.

With the trip of generation at Reece in Tasmania at around 6 am, total generation in Tasmania was approaching full capacity by 7.30 am. This high level of dispatch reduced the ability to adequately supply raise frequency control services for Tasmania. This reduced availability of raise services in Tasmania led to a greater requirement from the mainland. To enable a greater transfer of those mainland frequency services, Basslink was targeted to export more energy north. This further increased Hydro Tasmania's energy dispatch level, reducing its ability to supply raise frequency control services locally.

Tasmania generators were unable to increase energy output to a level that allowed Basslink to transfer all of the requirements for frequency services. No combination of Hydro Tasmania dispatch and Basslink flows above 50 MW allowed for sufficient supply of frequency control services. The no-go zone was preventing Basslink from flowing into Tasmania, which would have reduced Tasmanian generation and allowed frequency services to be transferred into Tasmania.

As a result, violations of the frequency control requirements occurred between 7.25 am and 7.50 am and counter price flows across Basslink.

Table 1 below shows the difference between the 5-minute energy price in Tasmania and Victoria during this period. It highlights the dispatch intervals where FCAS constraints were violated, including the name of the constraints and whether the flow across Basslink and the FCAS requirement were co-optimised. The marginal value for the violated constraints is also included.

Table 1: Violated constraints

Time	Tas/Vic energy price separation	Service	Constraint ID	Basslink Trade-off	Marginal Value
07:25	$9972/MWh	RAISE 5M	F_T++NIL_MG_R5	Yes	30,000
		RAISE REG	F_T++RREG_0050	Yes	20,000
07:35	$9971/MWh	RAISE 5M	F_T++NIL_MG_R5	Yes	30,000
		RAISE 6S	F_T++NIL_MG_R6	Yes	50,000
		RAISE REG	F_T++RREG_0050	Yes	20,000
07:40	$9964/MWh	RAISE 5M	F_T++NIL_MG_R5	Yes	30,000
		RAISE 6S	F_T++NIL_MG_R6	Yes	50,000
		RAISE REG	F_T++RREG_0050	Yes	20,000
07:45	$9961/MWh	RAISE 5M	F_T++NIL_MG_R5	Yes	30,000
		RAISE 6S	F_T++NIL_MG_R6	Yes	50,000
		RAISE REG	F_T++RREG_0050	Yes	20,000
07:50	$7962/MWh	RAISE 5M	F_T+NIL_MG_R5	No	30,000
		RAISE 6S	F_T+NIL_MG_R6	No	50,000
		RAISE REG	F_T+RREG_0050	No	20,000

The benefit of keeping flows above the no-go zone for most of these dispatch intervals, in terms of NEMDE optimisation, can be demonstrated as follows.

An increase in Basslink flow northwards by 1 MW leads to a reduction of the dispatch costs of around $90 000 as a result of the cumulative effect of the cost of ancillary services. That is for 7.25 am a $30 000+$20 000 = $50 000 reduction in FCAS costs, outweighs the increase in energy costs of around $10 000, which leads to counter price flows.

Whilst keeping flows outside of the no-go zone, the dispatch engine is prevented from determining a more efficient solution, albeit a solution that will take two dispatch intervals to attain. As a result, the dispatch algorithm will maintain flows north under these circumstances, often for extended periods, despite the energy transfer being counter-price.

This cycle will be broken if the energy market target goes to the no-go zone boundary, in which case the next dispatch interval will prohibit the transfer of frequency services across Basslink (and therefore the co-optimisation of the energy and FCAS across Basslink). This will not, however, occur in the presence of violated FCAS constraints, as the cost of these constraints, which are valued at multiples of VoLL, will always outweigh the cost of counter priced energy flows.

At 7.50 am, Basslink was metered at 44 MW. That is, at the start of the dispatch interval, the flow across Basslink was metered to be within the no-go zone. The metered flow on Basslink was lower that its previous target of 58 MW by 14 MW, which was coincidentally within the no-go zone. If Basslink flow is metered within the no-go zone, it is deemed to be unable to transfer frequency services between the mainland and Tasmania. As a result, the constraints setting the frequency service requirements during this period prevented the transfer of services across Basslink. As a result, all of the raise frequency requirements had to be sourced locally in Tasmania.

The flow across Basslink for the next dispatch interval was now determined based on energy market outcomes in Tasmania and Victoria and not the FCAS markets, and as such, the dispatch algorithm reduced the flow north from 58 MW to 50 MW, on the boundary of the no-go zone. Some violations of the frequency markets remained for this dispatch interval as Hydro Tasmania's generators were dispatched to a level that kept Basslink on the boundary of the no-go zone.

At 7.55 am, Basslink was targeted to flow into Tasmania with prices aligned with the mainland. Frequency control ancillary services were being sourced solely within Tasmania – there were no shortages for any of the frequency services. Flows remained within the no-go zone until 8.15 am, when constraints employed by NEMMCO forced flow into Tasmania.