

ESOPP GUIDE

FCAS CONSTRAINT EQUATIONS

PREPARED BY: Ben Blake

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6	6 April 2009	Ben Blake	Updated for co-optimisation of 5 min and Regulation services
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1 Definitions

NAME	DEFINITION
FCAS	Frequency Control Ancillary Service
Global Requirement	FCAS requirement for all regions in the NEM (Queensland, New South Wales, Victoria, South Australia and Tasmania)
LHS	Left Hand Side of a constraint equation. This consists of the variables that can be optimised by NEMDE. These terms include scheduled or semi-scheduled generators, scheduled loads, regulated Interconnectors, MNSPs or regional FCAS requirements.
Local Requirement	An FCAS requirement for a single or group of regions
Mainland	The NEM interconnected regions (Queensland, New South Wales, Victoria and South Australia)
NEMDE	National Electricity Market Dispatch Engine
System Normal	The configuration of the power system where the status of all major transmission elements is normal (this usually means all major transmission elements are in service).

2 References

- SO_OP3709 – Generic Constraints due to Network Limitations: <http://www.aemo.com.au/electricityops/3709.html>
- SO_OP3708A - Frequency Control Ancillary Services
- Reliability Panel Frequency Operating Standards: <http://www.aemc.gov.au/Market-Reviews/Completed/Review-of-Mainland-Frequency-Operating-Standards-during-Periods-of-Supply-Scarcity.html>
- Dispatch of Contingency Frequency Control Ancillary Services – Consultation Report

3 Introduction

The control of frequency on the power system is managed through the dispatch of frequency control ancillary services (FCAS). FCAS is allocated in the NEM according to standards specified by the Reliability Panel. AEMO procures FCAS to ensure that when an event occurs on the power system (e.g. loss of the largest generator or loss of an interconnector and subsequent islanding of a region) frequency is maintained within these standards.

Constraint equations are used by AEMO to determine the amount of FCAS required for each of the 8 services. Constraints are used to specify global requirements, local requirements for one or more regions, and for co-optimisation of local FCAS requirements against interconnector flow in the event of the interconnector being declared a credible contingency risk.

4 General Principles

4.1 Frequency Operating Standards

The following table applies to any part of the mainland power system other than an island.

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
Accumulated time error	5 seconds		
no contingency event or load event	49.75 to 50.25 Hz, 49.85 to 50.15 Hz 99% of the time	49.85 to 50.15 Hz within 5 minutes	
generation event or load event	49.5 to 50.5 Hz	49.85 to 50.15 Hz within 5 minutes	
network event	49 to 51 Hz	49.5 to 50.5 Hz within 1 minute	49.85 to 50.15 Hz within 5 minutes
separation event	49 to 51 Hz	49.5 to 50.5 Hz within 2 minutes	49.85 to 50.15 Hz within 10 minutes
multiple contingency event	47 to 52 Hz	49.5 to 50.5 Hz within 2 minutes	49.85 to 50.15 Hz within 10 minutes

The following table applies to a mainland island:

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
no contingency event or load event	49.5 to 50.5 Hz		
generation event, load event or network event	49 to 51 Hz	49.5 to 50.5 Hz within 5 minutes	
the separation event that formed the island	49 to 51 Hz or a wider band notified to AEMO by a relevant Jurisdictional Coordinator	49 to 51 Hz within 2 minutes	49.5 to 50.5 Hz within 10 minutes
multiple contingency event including a further separation event	47 to 52 Hz	49 to 51 Hz within 2 minutes	49.5 to 50.5 Hz within 10 minutes

The following table applies to any part of Tasmania other than an island:

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
Accumulated time error	15 seconds		
no contingency event or load event	49.75 to 50.25 Hz, 49.85 to 50.15 Hz 99% of the time	49.85 to 50.15 Hz within 5 minutes	
generation event, load event or network event	48 to 52 Hz	49.85 to 50.15 Hz within 10 minutes	
separation event	47 to 55 Hz	48 to 52 Hz within 2 minutes	49.85 to 50.15 Hz within 10 minutes
multiple contingency event	47 to 55 Hz	48 to 52 Hz within 2 minutes	49.85 to 50.15 Hz within 10 minutes

The following table applies to a Tasmanian island:

CONDITION	CONTAINMENT	STABILISATION	RECOVERY
no contingency event or load event	49.0 to 51.0 Hz	49 to 51 Hz within 10 minutes	
generation event, load event or network event	48 to 52 Hz (Note 3)		
the separation event that formed the island	47 to 55 Hz	48 to 52 Hz within 2 minutes	49 to 51 Hz within 10 minutes
multiple contingency event including a further separation event	47 to 55 Hz	48 to 52 Hz within 2 minutes	49 to 51 Hz within 10 minutes

Note 1: Where the frequency standards do not specify a frequency level for stabilisation within 60 sec, then the 60 sec requirement is referenced on the containment frequency. Where the stabilisation band requires a frequency level to be achieved within 2 minutes, this is taken to be required within 60 sec.

Note 2: the Jurisdictional Coordinator for South Australia has notified AEMO that the frequency band for separation of the South Australian power system is 47 to 52 Hz. The Reliability Panel has anticipated that under-frequency relays will operate at frequency levels in the low end of this range. The fast raise requirement for South Australian islanding will thus be reduced by the expected amount of involuntary load shedding.

Note 3: Where it is not feasible to schedule sufficient FCAS to limit frequency excursions to within this range, operation of the UFLSS or OFGSS is acceptable on the occurrence of a further contingency event.

4.2 Generic FCAS Constraint Formulation

For Global or Local requirements:

$$\begin{aligned}
 & \text{FCAS Requirement Region 1 (Service xx) + ... +} \\
 & \text{FCAS Requirement Region n (Service xx)} \geq \\
 & \text{RHS}
 \end{aligned}$$

Where the Service is the same for all regions and is one of the 8 raise or lower services

For co-optimisation of FCAS against interconnector flow:

$$\begin{aligned}
 & \text{FCAS Requirement Region 1 (Service xx) + ... +} \\
 & \text{FCAS Requirement Region n (Service xx)} \\
 & \text{+/- Inter-Connector Flow} \geq \\
 & \text{RHS}
 \end{aligned}$$

Regulation service providers are expected to respond within 5 minutes to a large frequency deviation; as such the amount of enabled regulation is subtracted from the RHS for both co-optimised and Global/Local 5 minute (delayed) FCAS constraints.

For a generator that will be left connected to the adjacent region on region separation, no FCAS is sourced from that generator for any of the 8 services.

$$\text{FCAS Requirement Generator (Service)} \leq 0$$

4.3 Load Relief

When the frequency increases or decreases there is also a corresponding change in demand. This effect is called Load Relief and is taken into account when calculating requirements for FCAS. The change in demand is always in a direction that tends to alleviate the frequency deviation. i.e. for a reduction in frequency, the load relief is negative (decrease in demand), which tends to alleviate the falling frequency

For the Mainland regions for every 1% change in frequency (0.5 Hz) it is assumed there will be a corresponding 1.5% change in demand. In Tasmania the load relief is equivalent to a 1.0 % change in demand for every 1% change in frequency.

e.g. for a Mainland Maximum Generation event for 5 Min raise service the frequency standard is 49.85 to 50.15 Hz. To determine the load relief, divide the frequency change by 0.5 and then multiply this by the load relief. Therefore the load relief on the Mainland is:

$$(0.15 / 0.5) * 1.5\% = 0.3 * 1.5\%$$

Similarly for Tasmania this is:

$$(0.15 / 0.5) * 1.0\% = 0.3 * 1\%$$

4.4 Basslink

Unlike other interconnectors that are capable of transferring FCAS, Basslink is not permitted to transfer FCAS services beyond its upper and lower transfer limits (600 MW and -480 MW respectively). This requires the headroom between Basslink flow and Basslink limit to be considered when formulating FCAS equations. Basslink also has a No-Go zone between approximately -50 MW and +50 MW and is deemed to be unable to transfer FCAS services while flow is within this range. Basslink will be considered to be insensitive to frequency if any of the following are met:

- The Basslink dispatch target from the previous dispatch run is at the boundary or within the No-Go zone; or
- The Basslink frequency controller is not operational; or
- The Basslink measured flow at the start of the dispatch interval is within the range ± 50 MW; or
- The Basslink measured flow is equal to or greater than the bid availability.

For NEM regulation and Global contingent events there are 5 groups of constraints:

- Global requirements
- Local requirements for Mainland and Tasmania when Basslink is in the No-Go zone
- Basslink flow co-optimised with Mainland or Tasmania local requirement when Basslink is able to transfer FCAS.

For local contingent events there are 3 groups of constraints:

- Global requirements
- Local requirements when Basslink is in the No-Go zone
- Basslink flow co-optimised with local requirements when Basslink is able to transfer FCAS.

e.g. for an outage of a Heywood to APD 500kV line, where the loss of all the APD load is credible, there would be 9 constraints: 3 constraints (6 sec, 60 sec and 5 min lower) for the Global requirement, 3 for Mainland requirement (Basslink in No-Go zone) and 3 for Mainland requirement co-optimised with Basslink flow.

4.5 Co-Optimisation of 5 min and Regulation services

The 5 min and regulation services are both delivered in the 5 minute timeframe so the amount of regulation is subtracted from the 5 min service. This is implemented in the constraint equations (post 1st January 2009) by including the regulation on the LHS:

$$\begin{aligned} & \text{FCAS Requirement Region(s) (Lower or Raise 5 min Service) +} \\ & \text{FCAS Requirement Region(s) (Lower or Raise Regulation Service)} \geq \text{RHS} \end{aligned}$$

A number of the standards can be satisfied in 10 minutes instead of 5. In these cases 2x the regulation is subtracted. However, since NEMDE requires that the LHS factors on FCAS constraint equations are 1 these are implemented so that the first 5 minutes of dispatched regulation is on the LHS and the 2nd 5 mins is on the RHS as a constant:

$$\begin{aligned} & \text{FCAS Requirement Region(s) (Lower or Raise 5 min Service)} \\ & + \text{FCAS Requirement Region(s) (Lower or Raise Regulation Service)} \geq \\ & \text{RHS} - \text{Regulation Dispatch in the 2nd 5 mins (Constant)} \end{aligned}$$

Where the constant is the current minimum regulation requirement for the region(s) on the LHS e.g Mainland = 130 MW, Tasmania = 50 MW

5 FCAS Constraint Formulation

5.1 Regulation

The “No Contingency or Load Event” condition in the Frequency Operating Standards covers the minor variations around 50 Hz that occur continually as a result of normal fluctuations in consumer demand and generating unit performance. This condition (commonly referred to as regulation) is addressed by allocating raise and lower regulation services.

Global requirement:

$$\begin{aligned} & \text{All NEM Regions (Raise)} \geq \text{Global Raise Regulation value} \\ & \text{All NEM Regions (Lower)} \geq \text{Global Lower Regulation value} \end{aligned}$$

Mainland requirement:

For Basslink in No-Go zone or frequency insensitive:

$$\begin{aligned} & \text{All Mainland Regions (Raise)} \geq \text{Mainland Raise Regulation value} \\ & \text{All Mainland Regions (Lower)} \geq \text{Mainland Lower Regulation value} \end{aligned}$$

For Basslink not in No-Go zone and able to transfer FCAS:

$$\begin{aligned} & \text{All Mainland Regions (Raise)} \\ & - \text{Basslink flow} \geq \\ & \text{Mainland Raise Regulation value} \\ & + 50 \text{ (if Basslink} < -50) \\ & - \text{Max Bid Availability (Tasmania to Victoria) (if Basslink} > 50) \end{aligned}$$

$$\begin{aligned} & \text{All Mainland Regions (Lower)} \\ & + \text{Basslink flow} \geq \\ & \text{Mainland Lower Regulation value} \\ & - \text{Max Bid Availability (Victoria to Tasmania) (if Basslink} < -50) \end{aligned}$$

+ 50 (if Basslink > 50)

Tasmania requirement:

For Basslink in No-Go zone or frequency insensitive:

Tasmania (Raise or Lower) \geq Tasmania Regulation value

For Basslink not in No-Go zone and able to transfer FCAS:

Tasmania (Raise)

+ Basslink flow \geq

Tasmania Raise Regulation value

- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

Tasmania (Lower)

- Basslink flow \geq

Tasmania Lower Regulation value

+ 50 (if Basslink < -50)

- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)

Examples

For a system normal Raise Regulation value of 130 MW on Mainland and Global and 50 MW in Tasmania:

All NEM Regions (Raise Regulation) \geq 130

All Mainland Regions (Raise Regulation) \geq 130

(Swamp if Basslink able to transfer FCAS)

All Mainland Regions (Raise Regulation)

- Basslink Flow \geq

130

+ 50 (if Basslink < -50)

- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

Tasmania Region (Raise Regulation) \geq 50

(Swamp if Basslink able to transfer FCAS)

Tasmania Region (Raise Regulation)

+ Basslink Flow \geq

50

- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

5.2 Generation Event

The “Generation Event” condition covers the loss of the largest single generating unit in a region or regions, except where the loss is the result of losing a network element. This is referred to as MG and is addressed by allocating raise (6s, 60s and 5 min) services.

Global requirement:

- All NEM Regions (Raise) \geq*
- Largest Generator in NEM*
- Load Relief in NEM regions*

Mainland requirement:

For Basslink in No-Go zone or frequency insensitive:

- All Mainland Regions (Raise) \geq*
- Largest Generator in Mainland regions*
- Load Relief from Mainland regions*

For Basslink not in No-Go zone and able to transfer FCAS:

- All Mainland Regions (Raise)*
- Basslink flow \geq*
- Largest Generator in Mainland regions*
- Load Relief from Mainland regions*
- + 50 (if Basslink < -50)*
- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)*

Tasmania requirement:

- Tasmania (Raise) \geq EMS Calc¹ for Tasmania Generation Event*

For Basslink not in No-Go zone and able to transfer FCAS:

- Tasmania (Raise)*
- + Basslink flow \geq*
- EMS Calc for Tasmanian Generation Event*
- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)*
- + 50 (if Basslink > 50)*

Example

For system normal MG the Raise 60 sec constraints are:

- All NEM Regions (Raise 60 sec) \geq*
- Largest single Generator in the NEM*
- 1 x 0.015 x Mainland Demand*
- 4 x 0.01 x Tasmania Demand*

¹ EMS calculations incorporating the effect of inertia will be performed to determine the Tasmanian FCAS requirement for contingent events.

All Mainland Regions (Raise 60 sec) \geq
Largest single Generator in Mainland
- 1 x 0.015 x Mainland Demand
 (Swamp if Basslink able to transfer FCAS)

All Mainland Regions (Raise 60 sec)
- Basslink Flow \geq
Largest single Generator in Mainland
- 1 x 0.015 x Mainland Demand
+ 50 (if Basslink < -50)
- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)
 (Swamp if Basslink is unable to transfer FCAS)

Tasmania Region (Raise 60 sec) \geq EMS Calc for Tasmania Generation Event
 (Swamp if Basslink able to transfer FCAS)

Tasmania Region (Raise 60 sec)
+ Basslink Flow \geq
EMS Calc for Tasmania Generation Event
- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)
+ 50 (if Basslink > 50)
 (Swamp if Basslink is unable to transfer FCAS)

5.3 Load Event

The “Load Event” condition covers the loss of the single largest load in a region or group of regions, except where the loss is the result of losing a network element. This is referred to as ML and is addressed by allocating lower (6s, 60s and 5 min) services.

Global requirement:

All NEM Regions (Lower) \geq
Largest single load in NEM Regions
- Load Relief in NEM regions

Mainland requirement:

For Basslink in No-Go zone or frequency insensitive:

All Mainland Regions (Lower) \geq
Largest single load in Mainland regions
- Load Relief from Mainland regions

For Basslink not in No-Go zone and able to transfer FCAS:

All Mainland Regions (Lower)
+ Basslink flow \geq

Largest single load in Mainland regions

- Load Relief from Mainland regions

- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

Tasmania requirement:

For Basslink in No-Go zone or frequency insensitive:

Tasmania (Lower) \geq EMS Calc for Tasmania Load Event

For Basslink not in No-Go zone and able to transfer FCAS:

Tasmania (Lower)

- Basslink flow \geq

EMS Calc for Tasmania Load Event

+ 50 (if Basslink < -50)

- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)

Example

For system normal ML the Lower 6 sec constraints are:

All NEM Regions (Lower 6 sec) \geq

Largest single Load Event in the NEM (400 MW)

- 1 x 0.015 x Mainland Demand

- 4 x 0.01 x Tasmania Demand

All Mainland Regions (Lower 6 sec) \geq

Largest single Load Event in Mainland (400 MW)

- 1 x 0.015 x Mainland Demand

(Swamp if Basslink able to transfer FCAS)

All Mainland Regions (Lower 6 sec)

+ Basslink Flow \geq

Largest single Load Event in Mainland (400 MW)

- 1 x 0.015 x Mainland Demand

- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

Tasmania Region (Lower 6 sec) \geq EMS Calc for Tasmania Load Event

(Swamp if Basslink able to transfer FCAS)

Tasmania Region (Lower 6 sec)

- Basslink Flow \geq

EMS Calc for Tasmania Load Event

+ 50 (if Basslink < -50)

- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

5.4 Network Event

The “Network Event” condition is where the loss of a network element (transmission line or transformer) results in the loss of a generator or load. These are referred to as TG and TL respectively.

The general form of the TG equations is the same as for the Generation event except the load relief term has a different factor to take into account the different frequency standard. The same logic applies between the TL and Load event equations.

Examples

For an outage of one APD to Heywood 500kV line, loss of the parallel line will cause 600 MW of load at APD to be disconnected from the network. The Lower 60 sec constraints are:

All NEM Regions (Lower 60 sec) \geq

600

- 1 x 0.015 x Mainland Demand

- 4 x 0.01 x Tasmania Demand

All Mainland Regions (Lower 60 sec) \geq

600

- 1 x 0.015 x Mainland Demand

(Swamp if Basslink able to transfer FCAS)

All Mainland Regions (Lower 60 sec)

+ Basslink Flow \geq

600

- 1 x 0.015 x Mainland Demand

- Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

For loss of 1000 MW of generation due to trip of a transmission line the Raise 6 sec constraints are:

All NEM Regions (Raise 6 sec) \geq

1000

- 2 x 0.015 x Mainland Demand

- 4 x 0.01 x Tasmania Demand

All Mainland Regions (Raise 6 sec) \geq

1000

- 2 x 0.15 x Mainland Demand

(Swamp if Basslink able to transfer FCAS)

All Mainland Regions (Raise 6 sec)

- Basslink Flow \geq

1000

- 2 x 0.015 x Mainland Demand

+ 50 (if Basslink < -50)

- Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)

5.5 Separation Event

The "Separation Event" condition is where the loss of a network element (transmission line or transformer) results in the separation of two adjacent areas of the NEM. Examples of this condition are:

- Loss of Basslink under system normal for Mainland FCAS (the loss of Basslink is considered a network event under the Tasmanian frequency operating standard).
- Prior outage of a single transmission line on the double circuit link between Liddell PS in NSW and Bulli Creek in Queensland. Loss of the parallel transmission line would result in separation between Queensland and NSW.
- Prior outage of a single transmission line between Sydenham in Victoria and South East in South Australia. Loss of the parallel transmission line would result in separation between Victoria and SA

Global requirement:

All Regions on one side of the interconnector at risk (Raise)

- Interconnector at risk flow into those regions \geq

Load added to the regions on separation

- Load Relief from these regions

All Regions on one side of the interconnector at risk (Lower)

- Interconnector at risk flow out of those regions \geq

- Load added to the regions on separation

- Load Relief from these regions

There are 2 constraints for each service. One constraint is for the region(s) on one side of the interconnector, the other for the regions on the other side.

The load relief excludes the load that becomes physically disconnected, and includes load that becomes physically connected, post-separation.

Additional requirements if one of the regions is Victoria:

For Basslink in No-Go zone or frequency insensitive:

Subset of Mainland Regions that includes Victoria (Raise)

- ***Interconnector at risk flow into those regions \geq***
Load added to the regions on separation
- ***Load Relief from these regions***

Subset of Mainland Regions that includes Victoria (Lower)

- ***Interconnector at risk flow out of those regions \geq***
Load added to the regions on separation
- ***Load Relief from these regions***

For Basslink not in No-Go zone and able to transfer FCAS:

Subset of Mainland Regions that includes Victoria (Raise)

- ***Interconnector at risk flow into those regions***
- ***Basslink flow \geq***
Load added to the regions on separation
- ***Load Relief from these regions***
- + ***50 (if Basslink < -50)***
- ***Max Bid Availability (Tasmania to Victoria) (if Basslink > 50)***

Subset of Mainland Regions that includes Victoria (Lower)

- ***Interconnector at risk flow out of those regions***
- + ***Basslink flow \geq***
Load added to the regions on separation
- ***Load Relief from these regions***
- ***Max Bid Availability (Victoria to Tasmania) (if Basslink < -50)***
- + ***50 (if Basslink > 50)***

Examples

For an outage of a Liddell to Muswellbrook (83) 330kV line, loss of Liddell to Tamworth (84) will cause Qld to separate from NSW and leave Armidale, Lismore, Muswellbrook, Redbank PS and Tamworth effectively connected to Qld. The Lower 5 min constraints are:

Qld (Lower 5 min)

- + ***Qld (Lower Regulation)***
- + ***NSW-Qld Interconnector flow***
- + ***Directlink flow \geq***
 - ***Demand at Armidale, Lismore, Muswellbrook and Tamworth***
 - ***1 x 0.015 x (Demand in Qld***
- Demand at Armidale, Lismore, Muswellbrook and Tamworth)

- 1 x minimum Lower Regulation in Qld

Note: the load relief in Queensland uses the island frequency standard (separation event that formed the island). Post separation Queensland will be an island.

NSW, Vic, SA and Tasmania (Lower 5 min)

+ NSW, Vic, SA and Tasmania (Lower Regulation)

- NSW-Qld Interconnector flow

- Directlink flow \geq

Demand at Armidale, Lismore, Muswellbrook and Tamworth

- 0.3 x 0.015 x (Demand in NSW, Vic and SA

- Demand at Armidale, Lismore, Muswellbrook and Tamworth)

- 0.3 * 0.01 * Demand in Tasmania

- 1 x minimum Lower Regulation in NSW, Vic, SA and Tasmania

NSW, Vic and SA (Lower 5 min)

+ NSW, Vic and SA (Lower Regulation)

- NSW-Qld Interconnector flow

- Directlink flow \geq

Demand at Armidale, Lismore, Muswellbrook and Tamworth

- 0.3 x 0.015 x (Demand in NSW, Vic and SA

- Demand at Armidale, Lismore, Muswellbrook and Tamworth)

- 1 x minimum Lower Regulation in NSW, Vic and SA

(Swamp if Basslink able to transfer FCAS)

NSW, Vic and SA (Lower 5 min)

+ NSW, Vic and SA (Lower Regulation)

- NSW-Qld Interconnector flow

- Directlink flow

+ Basslink flow \geq

Demand at Armidale, Lismore, Muswellbrook and Tamworth

- 0.3 x 0.015 x (Demand in NSW, Vic and SA

- Demand at Armidale, Lismore, Muswellbrook and Tamworth)

- 1 x minimum Lower Regulation in NSW, Vic and SA

- Max Bid Availability (Vic to Tasmania) (if Basslink < -50)

+ 50 (if Basslink > 50)

(Swamp if Basslink is unable to transfer FCAS)