



Final Decision

**APPLICATIONS FOR EXCLUSION FROM THE
VICTORIAN SERVICE INCENTIVES FOR
SUPPLY RELIABILITY**

**SUPPLY INTERRUPTION EVENTS
MARCH–DECEMBER 2009**

10 September 2010

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1 Introduction

Jemena, Powercor, SP AusNet¹ and United Energy applied to the Australian Energy Regulator (AER) to exclude supply interruption events that occurred between March and December 2009 from the supply reliability service incentive scheme under the Essential Services Commission of Victoria's (ESCV) *Electricity Distribution Price Review 2006–10* (Price Review).

The AER published two draft decisions on 24 June and 5 July 2010 proposing to— with the exception of Powercor application regarding supply outages to enable repair works of Ballarat–Bendigo 220kV transmission line on 17 December 2009—approve all other applications and invited stakeholders to provide submissions in response to the draft decision. This paper presents the final decision on the distributors' applications regarding the following supply interruption events:

- to approve the:
 - application by Powercor regarding wide-scale supply interruptions on 3 March 2009—under the exclusion criterion for excluding exceptional events, where the level of supply interruptions exceeded the threshold for exclusion set out by the ESCV²
 - application by SP AusNet regarding an outage event at Wodonga Terminal Station on 3 April 2009
 - applications by United Energy and SP AusNet regarding an outage event at Ringwood Terminal Station on 23 April 2009
 - application by Powercor for an outage event at Bendigo Terminal Station on 9 June 2009
 - applications by United Energy and SP AusNet regarding an outage event at Cranbourne Terminal Station on 2 July 2009
 - applications by Powercor and Jemena regarding an outage event at Keilor Terminal Station on 8 October 2009
 - applications by Powercor and Jemena regarding an outage event at Keilor Terminal Station on 9 November 2009
 - application by Powercor regarding an outage event at Red Cliffs Terminal Station on 26 November 2009
- not to approve the application by Powercor regarding supply outages to enable repair works of Ballarat–Bendigo 220kV transmission line on 17 December 2009.

¹ The trading name of SPI Electricity Pty Ltd.

² Refer to the *Electricity Distribution Code*, clause 6.3.4 and Table 2.1 of the *Price Review – Volume 2 Price Determination*.

1.1 The role of the AER

As part of the transition to national regulation of energy markets, the AER is exercising certain powers and functions previously undertaken by the ESCV. The new responsibilities are conferred on the AER by the operation of the *National Electricity (Victoria) Act 2005* (NEVA) in accordance with the *Trade Practices Act 1974* and the Australian Energy Market Agreement. The NEVA specifically confers economic regulatory functions, powers and duties on the AER.

The AER is making this draft decision under the ESCV's 2006–10 Price Review and *Electricity Distribution Code* provisions for approving exclusions from the calculation of the S factor and the obligation to make supply reliability guaranteed service level (GSL) payments respectively.

1.2 The ESCV's service (reliability) incentive scheme

The ESCV incorporated a service incentive scheme in the 2006–10 Price Review. The incentives of the scheme are in the form of:

- A service term (S factor) in the price control formula, giving it the form of $(1+CPI)(1-X)S$

If a distributor provides an average level of reliability above the target levels, then its distribution tariffs will rise in subsequent years. If reliability is worse than the target levels, the tariffs will fall.

- Guaranteed service level payments to customers for low reliability.

Customers are entitled to receive a credit if they experience more than the specified number of sustained or momentary interruptions³ in a calendar year, or if they experience a cumulative supply interruption time longer than the specified number of hours.

Further information on the service incentive scheme is contained in the 2006–10 Price Review final decision papers available from the ESCV's website.⁴

1.3 Exclusion from the service incentive scheme

On application by distributors, the AER may approve exclusions from the calculation of the S factor and from the requirement to make certain GSL payments for supply interruptions due to the following events:

- supply interruptions made at the request of the affected distribution customer

³ Supply interruptions shorter than one minute are classified as momentary interruptions.

⁴ At <http://www.esc.vic.gov.au/public/Energy/Regulation+and+Compliance/Decisions+and+Determinations/Electricity+Distribution+Price+Review+2006-10/Electricity+Distribution+Price+Review+2006-10.htm>.

- load shedding due to a shortfall in generation, but not a shortfall in embedded generation that has been contracted to provide network support except where prior approval has been obtained from the ESCV or AER, where relevant
- supply interruptions caused by a failure of the shared transmission network
- supply interruptions caused by a failure of transmission connection assets, to the extent that the interruptions were not due to inadequate planning of transmission connections
- where prior written approval has been obtained from the ESCV or AER, load shedding due to a shortfall from demand side response initiatives
- exceptional supply interruption events where the level of supply interruptions exceeds the threshold for exclusion set by the ESCV, as specified in Table 2.1 of the Price Review – *Volume 2 Price Determination*

The Price Review requires that distributors apply to the AER for such exclusions within 30 business days of an event occurring, identifying:

- the relevant event
- the impact of the event on the distribution business’s reliability performance
- the proposed extent of the exclusions
- reasons for the exclusions.

The Price Review also requires the AER to provide a statement of reasons on whether it proposes to approve the applications by the distributors, and to consult with stakeholders before making a final decision.

There are no specific time requirements for approval of the applications. The AER prefers to process straight forward (clear-cut) events in batches for administrative efficiency.

1.4 Structure of this paper

Chapter 2 provides an overview of the supply interruption events and the AER’s draft decision.

Chapter 3 provides an overview of any submissions received by the AER.

Chapter 4 states the AER’s final decisions regarding the distributors’ applications.

2 Summary of the supply interruption events and the AER's draft decision

2.1 Summary of the supply interruption events

2.1.1 Wide-scale supply interruptions on 3 March 2009—unplanned interruption frequency exceeds the threshold for exclusion set by the ESCV

Powercor advised that:

On 2 March 2009, severe weather and extreme bushfire conditions were forecast across Victoria. Customer interruptions were experienced across Powercor's network from 3 March 2009 due to:

- debris hitting power lines due to high winds
- light rain tracking across high voltage insulators causing pole fires.⁵

Major outages started to occur at approximately 8 am of 3 March 2009.

According to Powercor, on the evening of 2 March 2009, in response to the prediction of severe weather conditions, it initiated its escalation procedures such that:

- its full escalation team was assembled by 8 am the following day (3 March 2009)
- field crews and contractors, which were normally involved in construction work, were ready to assist in fault response crews
- the call centre called in extra staff — this permitted 85.8 per cent of the 11,858 calls received on that day to be answered within 30 seconds.

Powercor further advised that the escalation process continued throughout 3 March 2009 and that de-manning did not occur until 4 March 2009.

As a consequence of the severe weather conditions, Powercor experienced a daily unplanned interruption frequency of 0.127, which exceeded the threshold level of 0.11 as set out in Table 2.1 of the Price Review – *Volume 2 Price Determination*.

⁵ When the surface area of an electrical insulator becomes conductive as a result of an excessive build-up of dust and other pollutants, combined with light rain or mist, electric current flows from the high voltage power lines along the surface of the insulator, through the fixing bolt of the insulator and the cross-arm of the power pole to the other phase conductors, or to the general mass of the earth through the power pole. If there are combustible materials on the path of the leaking current (such as a wooden cross-arm or the body of a wooden pole) and the leakage reaches a sufficiently high level, the combustible material may ignite.

2.1.2 Outage event at Wodonga Terminal Station on 3 April 2009

SP AusNet advised that:

On the 3 April 2009, a lightning storm caused a flashover on insulators of the Dederang-Wodonga (DDTS-WOTS) 330 kV line, 29 km from WOTS, and the tripping the DDTS-WOTS 330 KV line. Protection at Jindera (a Transgrid substation in NSW) saw the fault and tripped the WOTS–Jindera 330kV line simultaneously at the Jindera end only. This resulted in the total loss of supply to WOTS.

Due to the fact that there were no voltage at WOTS the synch check protection functionality resulted in the DDTS-WOTS not reclosing at the WOTS end.

Investigation showed that the fault on the DDTS-WOTS line was the only fault and the DDTS-WOTS line protection operated correctly. Discussion with Transgrid revealed that a relay problem at Jindera resulted in a false trip of the WOTS-Jindera line at Jindera and the relay has since been replaced.

The incident occurred at 4:51 pm and resulted in the loss of 22 kV supplies from WOTS, as well as the loss of 66 kV supplies to Wodonga (WO) and Barnawartha (BWA) zone substations—resulting in supply lost to six WOTS 22 kV feeders, eight WO 22 kV feeders and four BWA feeders for up to 13 minutes.

2.1.3 Outage event at Ringwood Terminal Station on 23 April 2009

United Energy and SP AusNet advised that as a result of a 220/22kV transmission network connection transformer tripping at RWTS there were:

- an outage for approximately 11 minutes on feeder RWT24, which supplies United Energy’s customers
- outages that lasted for up-to 15 minutes on feeders RWT15 and RWT25, which supply SP AusNet’s customers.

According the distributors, the incident was caused by inadequate preparation of SPI PowerNet’s tester⁶ when undertaking current inject test of circuit breaker management relay of the transformer. Unaware that this relay also provided load information to the Overload Shedding Scheme for Connection Assets (OSSCA), the injection current resulted in load shedding by tripping the 22 kV feeders.

According to the distributors, the sustained interruption impacted:

- 2915 customers of United Energy, and resulted in a SAIDI of 0.05 minutes and a SAIFI of 0.005
- 5669 customers of SP AusNet, and resulted in a SAIDI of 0.12 and a SAIFI of 0.0094.

⁶ SPI PowerNet is the transmission service provider for Ringwood Terminal Station.

The distributors advised that SPI PowerNet informed them that its testers and its Transmission Operation Controllers will review planned work, and take into account the possible effects on the OSSCA scheme and other network control schemes in future.

2.1.4 Outage event at Bendigo Terminal Station on 9 June 2009

Powercor advised that, on 6 June 2009, the operation of the BETS No. 2 220/66/22 kV transformer 'Y' protection caused the No. 2 transformer circuit breakers to trip. The tripping resulted in the loss of supply to the 22 kV No.2 bus and three Powercor 22 kV feeders connected to the No. 2 bus (BET002, BET004 and BET006). Supply was interrupted for less than one minute and 11,109 customers were affected.

Powercor also advised that, based on an SPI PowerNet's incident report of the event, the interruption occurred as a result of SPI PowerNet incorrectly configuring the transformer 'Y' relay one week prior to the event. The loading conditions of 9 June triggered the incorrectly configured relay, which in-turn initiated a trip of the No. 2 Transformer circuit breaker. Powercor's network configuration was normal at the time of the event and loadings were within plant ratings.

Powercor noted that SPI PowerNet have since confirmed that the transformer 'Y' relay is now configured correctly.

2.1.5 Outage event at Cranbourne Terminal Station on 2 July 2009

United Energy and SP AusNet advised that the automatic load shedding scheme at CBTS activated on 2 July 2009 and caused power interruption to five zone substations of SP AusNet and two zone substations of United Energy that were supplied by this terminal station.⁷

The load shedding scheme was activated due to a large system disturbance caused by:

- the failure of the bay coupler circuit breaker current transformer (ID ref. 5042) at the Bayswater Power Station switchyard in New South Wales
- the disconnection from the system of multiple generators and transmission lines.

United Energy advised that this incident affected 43, 959 customers supplied by the Frankston and Carrum zone substation for six and seven minutes respectively. It also advised that this event added a SAIDI figure of 0.45 minutes and a SAIFI figure of 0.07 to its 2009 network reliability performance.

SP AusNet advised that this incident caused sustained interruptions to 64, 479 customers (0.11 SAIFI) for up-to 25 minutes and a SAIDI figure of 1.81.

⁷ The substations affected by this event were: (1) for United Energy, Frankston and Carrum Zone Substations, which are supplied from CBTS by 66 kV lines; and (2) for SP AusNet, Berwick North, Clyde North, Lang Lang, Narre Warren and Pakenham Zone Substations, which are also supplied from CBTS by 66 kV lines.

Both distributors advised that a post incident investigation revealed that incorrect settings had been applied to the load shedding relays during the commissioning of CBTS, as the correct settings to be applied were unavailable from VENCORP at the time.

According to United Energy and SP AusNet, SPI PowerNet (the relevant transmission network service provider) further advised that:

- It was in the process of implementing a program of applying new settings as specified by VENCORP at all stations under the frequency load shedding schemes.
- New settings at CBTS were applied on 3 July 2009.

2.1.6 Outage event at Keilor Terminal Station on 8 October 2009

Powercor and Jemena advised that:

On 8 October 2009, at 4:00 pm, the 220kV No.1 Bus of KTS tripped as a result of an bus protection fault. This led to the tripping of the B1 transformer at KTS.

At the time of this event, the 220kV No.3 Bus was out of service. The load on the remaining B2 and B4 transformers did not share equally after the tripping of the B1 transformer. This resulted in B2 transformer overloaded.

SPI PowerNet's transmission network controllers recognized that unequal loading of the transformers was due to a 66 kV network tie and, at 4:09 pm, commenced a strategy of splitting the 66 kV connection between B2 and B4 transformers by opening the 66 kV 2-3 and 1-4 Bus Ties.

Jemena and Powercor was instructed to open the loops across 66kV busses 1-2 and 3-4, and transfer load from the 66 kV 1-2 to 3-4 busses to enable urgent redistribution of 66 kV load. The result of these actions placed five Powercor zone substations⁸ and four of Jemena zone substations⁹ on radial supply from KTS B4 transformer.

At 4.21 pm, the B4 transformer tripped by over-current protection and resulted in the nine zone substations, hence the connected customer, disconnected from supply.

As the B2 transformer remained on supply, the lost load (from the B4 Transformer) was progressively restored via the B2 Transformer as far as the B2 transformer's rating would allow.

At 5:17 pm, the B3 transformer was returned to service and a 220 kV system tie was re-established via the 220kV No3 Bus. This allowed the remainder of lost load to be restored via B2 and B3 transformers.

⁸ Melton (MLN), St. Albans (SA), Sunshine East (SSE), Sunshine (SU) and Woodend (WND) zone substations.

⁹ Airport West (AW), St Albans (SA), Sunbury (SBY) and Sydenham (SHM) zone substations.

2.1.7 Outage event at Keilor Terminal Station on 9 November 2009

Powercor and Jemena advised that:

On 9 November 2009, SPI PowerNet (SPI)—the transmission network service provider—undertook a planned outage of the 220/66kV B2 transformer and the 66 kV No.2 Bus at KTS.

The overload shedding scheme for connection assets (OSSCA) was armed according to the project plan to prevent possible overload of the remaining assets.

According to SPI's technical report (a copy was provided to the AER), the outage assessment was based on the Bureau of Meteorology data, where the average maximum temperature for November was 21.2 degrees Celsius. Previous historical data at KTS showed that for a maximum temperature of up to 26.5 degrees Celsius, the demand at KTS does not exceed the rating of the two lowest rated transformers (N-2) rating. However, on the day of the planned outage the temperature reached 34 degrees Celsius during the day and caused the overloading of the transformers. Consequently, the OSSCA operated at KTS, tripping the B1 220/66kV transformer and load shed Group 1 of the scheme at 4:17 pm. This resulted in the loss of the KTS-SBY-SHM-KTS and the KTS-MLN-SBY-KTS 66kV loops supplying Jemena's Sunbury (SBY) and Sydenham (SHM) zone substations, as well as Powercor's Melton (MLN) and Woodend (WND) zone substations.

According to the distributors:

- The Network Coordination Centre observed a high load level alarm at KTS on its SCADA system at 12:28 pm and contacted SPI's Transmission Operation Centre. Jemena was advised that there was no requirement to transfer load unless further asset was lost. There was no advice of possible overloading of the transformer.
- At 4:17 pm, the rising load exceeded the rating of the B1 transformer causing the operation of OSSCA. The amount of load shed was 135 MW. The B1 Transformer was put back on load in 12 minutes and some lost load was restored up to the limit of the three transformers.
- At 5:04 pm (47 minutes after the load shed event) the B2 transformer was restored to service. Jemena and Powercor were instructed to restore all remaining load.
- SPI's PowerNet's System Incident Report indicated that the operation of OSSCA was correct in terms of the current limit expected for operation at the prevailing ambient temperature. However, the early warning of 95 per cent load level alarm was missed by both day shift controllers and not acted upon accordingly.

2.1.8 Outage event at Red Cliffs Terminal Station on 26 November 2009

Powercor advised that:

On the morning of Thursday 26 November 2009 storm activity occurred across its distribution. At 07:32 am, SPI PowerNet's RCTS 22kV No.1 Bus tripped due

to the operation of back up earth leakage protection. This coincided with a fault on the Powercor's 22kV RCT013 feeder caused by lightning activity.

SPI has advised that there was a miss-coordination of setting on the RCTS No.1 Bus protection, which resulted in this mal-operating before the Powercor RCTS013 feeder protection would operate. The incorrect setting on the Bus protection relays occurred during the recent rebuild project at the terminal station.

The operation of the Bus Protection resulted in sustained interruptions to four Powercor 22kV feeders, RCTS011, RCTS013, RCTS014 and RCTS015.

Powercor in conjunction with the SPI's control room restored supply to three of the feeders as follows:

- RCTS011 (981 customers) at 09:09 am
- RCTS014 (860 customers) at 09:10 am
- RCTS015 (21 customers) at 09:10 am.

RCTS013 22kV feeder suffered damage due to the prevailing storm and supply to the affected customers was restored at a later time. Powercor did not include the customer interruptions associated with the RCTS013 outages in this exclusion application.

Powercor's system configuration was normal and loading across its network was within the system rating limitations at the time of the event.

2.1.9 Supply outages to enable repair works of Ballarat–Bendigo 220kV transmission line on 17 December 2009 (event not approved in the draft decision)

Powercor advised that:

At 3:27 pm on Thursday 17 December 2009, storm activity across Central Victoria caused line conductors of SPI PowerNet's BATS-BETS 220skV line to fall off. In order to enable the repair of this 220 kV line, SPI instructed Powercor to de-energise Powercor assets in the vicinity of the failed 220kV line.

Powercor's assets impacted were:

- BETS to Castlemaine (CMN) 66kV sub transmission line (no customer interruptions)
- BET004 22kV distribution feeder (part of the feeder with 777 customers interrupted.)

The customer interruption started at 6:16 pm and supply was restored at 9:41 pm, after completion of the repair works by SPI.

2.2 AER's draft decision

With the exception of the supply outages to enable repair works of Ballarat–Bendigo 220kV transmission line on 17 December 2009, the AER proposed in its draft decisions to approve all other applications by the distributors to exclude the supply interruption events, as outlined in section 2.1, from the calculation of the S factor and the obligation to make supply reliability GSL payments. The draft decisions can be found on the AER's website.

With respect to Powercor's application to exclude the supply interruption event of 17 December 2009 under the exclusion criterion of 'outage due to failure of the shared transmission network', the AER considered that this supply interruption event did not meet the exclusion criterion because:

- The shared transmission network can be considered to have failed if the network does not have the necessary capacity to transmit, or is not available to transmit, electricity to distributors' transmission connection points. However, the failure of an item of plant or equipment forming part of the shared transmission network should not be considered as a failure of the shared transmission network unless that failure prevents the transmission network from performing its function of delivering electricity to the transmission connection points.
- Based on the information provided by Powercor, the AER considers that the supply outages occurred because a third party, in this instance SPI PowerNet, was working in the vicinity of Powercor's network, rather than the inability of the shared transmission network to provide the necessary capacity for Powercor to supply its customers. Hence, the AER does not consider that the shared transmission network failed in this instance.

3 Submissions received and the AER's analysis

3.1 Submissions

CitiPower and Powercor commented on the draft decisions and advised that both distributors supported the draft decisions to approve the applications made in relation to Powercor for:-

- 3 March 2009—unplanned interruption frequency exceeds the threshold for exclusion;
- 9 June 2009—outage at BETS
- 8 October 2009—outage at KTS
- 9 November 2009—outage at KTS
- 26 November 2009—outage at RCTS

Regarding the draft decision on Powercor's application to exclude the supply outages to enable repair works on the Ballarat-Bendigo 220 kV line on 17 December 2009, Powercor considered that the AER's analysis represented a narrow interpretation of the exclusion criteria 'caused by failure of the shared transmission network'. It will bear this in mind when similar operating situations arise in the future.

3.2 AER's analysis

Powercor sought exclusion of the supply outages to enable repair works for the Ballarat-Bendigo 220 kV line on 17 December 2009 under the criterion of '*supply interruptions caused by a failure of the shared transmission network*'.

The AER considers that the shared transmission network can be considered to have failed if the network does not have the necessary capacity to transmit, or is not available to transmit, electricity to distributors' transmission connection points. However, the failure of an item of plant or equipment forming part of the shared transmission network should not be considered as a failure of the shared transmission network unless that failure prevents the transmission network from performing its function of delivering electricity to the transmission connection points. As Powercor did not provide further evidence to support its application, the AER confirms that its draft decision is appropriate.

4 Final decision

The AER has not received any information that would lead it to amend its draft decisions. The AER therefore confirms its draft decisions:

- to approve the following supply interruption events for exclusion from the calculation of the S factor and from the obligation to make GSL payments for low reliability:
 - application by Powercor regarding wide-scale supply interruptions on 3 March 2009 under the exclusion criterion for excluding exceptional events, where the level of supply interruptions exceeded the threshold for exclusion set out by the ESCV
 - application by SP AusNet regarding an outage event at Wodonga Terminal Station on 3 April 2009
 - applications by United Energy and SP AusNet regarding an outage event at Ringwood Terminal Station on 23 April 2009
 - application by Powercor for an outage event at Bendigo Terminal Station on 9 June 2009
 - applications by United Energy and SP AusNet regarding an outage event at Cranbourne Terminal Station on 2 July 2009
 - applications by Powercor and Jemena regarding an outage event at Keilor Terminal Station on 8 October 2009
 - applications by Powercor and Jemena regarding an outage event at Keilor Terminal Station on 9 November 2009
 - application by Powercor regarding an outage event at Red Cliffs Terminal Station on 26 November 2009.
- NOT to approve the application by Powercor regarding supply outages to enable repair works of Ballarat–Bendigo 220kV transmission line on 17 December 2009 for exclusion from the calculation of the S factor and from the obligation to make GSL payments for low reliability.