Electricity Pricing Event Reports

SEPTEMBER 2015

TABLE OF CONTENTS

Friday 17 September 2015 – High Energy price SA

Market Outcomes: South Australian spot price reached $2,080.36/MWh for trading interval (TI) ending 1530 hrs.

Frequency Control Ancillary Services (FCAS) prices in South Australia, and energy and FCAS prices for the other NEM regions were not affected by this event.

An Over-constrained Dispatch (OCD) Interval existed for dispatch interval (DI) ending 1515 hrs when the published prices were not firm. A manual OCD run was performed to resolve the violated constraints and the firm prices were published by 1253 hrs on 18 September 2015 (Market Notice 49832).

Detailed Analysis: 5-Minute dispatch price reached $12,301.3/MWh in South Australia for dispatch interval (DI) ending 1515 hrs. The high price can be attributed to a tight supply-demand situation in South Australia following the unplanned outage of a transmission line and SVC.

South Australian demand was 1,280 MW for TI ending 1530 hrs. During the same TI, wind generation in South Australia was low at 177 MW.

At 1501 hrs, the South East - Tailem Bend No.1 275 kV line and South East No. 1 SVC tripped (Market Notice 49822) due to maloperation of a circuit breaker. Following the unplanned outage, constraint sets S-SE_VC_1 and S-TBSE were invoked from DI ending 1515 hrs to maintain transient and voltage stability, and prevent thermal overloads in the parallel 132 kV network.

A number of constraint equations in the invoked sets violated for DIs ending 1510 hrs and 1515 hrs. They include some constraint equations that manage the Heywood interconnector flow. The target flow on Heywood towards South Australia reduced from 460 MW for DI ending 1505 hrs to 163 MW for DI ending 1515 hrs. Murraylink interconnector was on a planned outage between 0500 hrs and 1930 hrs.

Cheaper priced generation was limited due to ramp up rates (Northern PS Unit 1, Torrens Island Units B1,B2,B4) or fast-start profiles (Hallett GT, Ladbroke PS Units 1 and 2, Dry Creek Units 2 and 3).

With the significant reduction in support from Victoria and limited cheaper generation within South Australia, the energy price in South Australia reached $12,301.3/MWh for DI ending 1515 hrs.

The 5-minute price reduced to $32.63/MWh for the next interval when the demand reduced by 106 MW while 84 MW of non-scheduled generation came online. A total of 690 MW of generation capacity was also rebid from higher priced bands to bands priced at or below $0/MWh.

The high 30-minute spot price for South Australia was not forecast in the pre-dispatch schedules, as it was the result of a tight supply-demand situation due to unplanned outages.

Tuesday 22 September 2015 – High Energy price SA, VIC, TAS

Market Outcomes: Spot prices in South Australia, Victoria and Tasmania were between $2,036.06/MWh and $2,328.72/MWh for trading interval (TI) ending 1900 hrs.

Frequency Control Ancillary Services (FCAS) prices in the high spot price regions, and energy and

FCAS prices for the other NEM regions were not affected by this event.

Detailed Analysis: The 5-minute prices in the southern regions were above $11,655/MWh for dispatch interval (DI) ending 1900 hrs. The high prices occurred during the evening peak demand period when flow from the northern regions were limited.

The demand in Victoria and Tasmania peaked at 6,804 MW and 1,576 MW for TI ending 1900 hrs for the day. In South Australia, the demand was increasing and reached 1,882 MW for TI ending 1900 hrs.

In Victoria, a total of 550 MW from Mortlake GT units 1 and 2 were bid unavailable for DIs ending 1850 hrs and 1900 hrs respectively with the reason “AVOID UNECONOMIC START AVOID SHORT RUN”.

In South Australia, for DI ending 1900 hrs, Alinta rebid 33 MW of generation capacity from Northern PS Unit 1 from bands priced at $46.06/MWh to bands priced at $13,329.95/MWh. For the same DI, 48 MW from Quarantine PS units 1 and 2 were bid unavailable with the reason “AVOID UNECONOMIC START – AVOID SHORT RUN”.

Cheaper priced generation was available but limited due to ramp rates (Murray PS), FCAS profiles (Lemonthyme-Wilmont PS, Catagunya-Liapootah-Wayatinah PS, Reece unit 2, Mackintosh PS and Trevallyn PS, Torrens Island A unit 3) or required more than one DI to synchronise (Quarantine GT unit 4, Bairnsdale GT unit 2, Tamar Valley OCGT units 1, 2 and 3).

A planned outage of the Upper Tumut – Canberra No. 1 330 kV line was scheduled between between 0718 hrs on 22 September 2015 and 1600 hrs on 24 September 2015. Outage constraint set N-CNUT_01 consisting of constraint equation N::V_CNUT_2 was invoked from DI ending 0705 hrs to manage this outage. The transient stablity constraint equation N::V_CNUT_2 manages the stability limit across Snowy to New South Wales for fault on various locations within the Yass – South Morang area. The constraint equation started binding from DI ending 1740 hrs resulting in the accumulation of negative residues across the New South Wales to Victoria directional interconnector. The negative residue constraint equation NRM_NSW1_VIC1 was automatically invoked from DIs ending 1835 hrs to 1930 hrs (Market Notices No. 49857 and 49858) to manage the accumulation of negative residues.

For DI ending 1900 hrs, the target flow on the VIC-NSW interconnector was limited to 18 MW towards Victoria by the negative residue management constraint equation NRM_NSW1_VIC1, and the outage constraint equation N::V_CNUT_2.

The spot prices in all three regions reduced to below $53/MWh for the subsequent DI with a decrease in demand in all three regions and rebid of approximately 372 MW of generation capacity to the lower priced bands. 96 MW of non-scheduled generation came online in South Australia during the subsequent DI.

The high 30-minute spot price for the southern regions was not forecast in the pre-dispatch schedules, as the target flow for the VIC-NSW interconnector in pre-dispatch was not as limiting as Dispatch. The pre-dispatch target flow is determined from the initial flow at the start of the TI (at 1830 hrs).

Wednesday 23 September 2015 – High Energy price NSW, High FCAS price QLD

Market Outcomes: Spot price in New South Wales reached $13,419.89/MWh and $6,717.38/MWh for Trading Intervals (TI) ending 1830 hrs and 1900 hrs respectively. Queensland Frequency Control Ancillary Service prices (sum of all services) reached $13,246.16/MWh and $6,620.91/MWh for the same trading intervals.

Counter price flows caused negative residues of approximately $3.5m to accumulate on the New South Wales to Victoria directional interconnector between TIs ending 1800 hrs and 1900 hrs. AEMO managed negative residues from 1800 hrs to 2000 hrs (Market Notices No. 49864 and 49866).

Energy and FCAS prices in other regions were not affected.

Further details are provided below.

Detailed Analysis: 5-minute dispatch price in New South Wales was above $13,404.83/MWh between DIs ending 1805 hrs and 1845 hrs. The Fast Lower service price in Queensland ranged between $13,205.65/MWh and $13,256.50/MWh during the same period. The high prices can be attributed to planned/short-notice outages of major transmission lines in New South Wales and Queensland.

New South Wales demand reached a peak of 10,176 MW for TI ending 1900 hrs. Queensland demand reached a peak of 6690 MW for the same interval.

Planned maintenance of Upper Tumut - Canberra No.1 330 kV line was scheduled between 0718 hrs on 22 September 2015 and 1504 hrs on 24 September 2015. Outage constraint set N-CNUT_01 was invoked from DI ending 0705 hrs on 22 September 2015 to manage the outage of the transmission line.

With the increasing evening demand in NSW, the N::V_CNUT_2 constraint equation within the N-CNUT_01 constraint set began to bind from DI ending 1735 hrs. This constraint equation prevents transient instability for faults on various locations within the Yass – South Morang area. The binding constraint equation constrained off a large amount of generation within NSW and forced the VIC-NSW Interconnector to flow towards Victoria during the high priced period. The target flow towards Victoria on the VIC-NSW interconnector increased from 96 MW for DI ending 1730 hrs to 890 MW for DI ending 1800 hrs.

The remaining cheaper generation in New South Wales was limited by ramp rates, FCAS profiles or fast-start profiles. Generation offers priced at or above $13,404.83/MWh had to be cleared from Bayswater Units 1 to 4 or Mt Piper Units 1 and 2 to meet the demand for the high priced DIs.

Due to the counter-price flow on the VIC-NSW interconnector, the negative residue management (NRM) constraint equation NRM_NSW1_VIC1 was invoked from DI ending 1805 hrs. The NRM constraint equation reduced the interconnector flow towards Victoria from 512 MW to 0 MW between DIs ending 1805 hrs and 1850 hrs.

A short notice outage of the Armidale 330 kV Bus section 1 was scheduled between 1614 hrs and 1918 hrs on 23 September 2015. The bus outage required the Armidale – Dumaresq 8C 330 kV line to be

taken out of service during that period. The outage of the 8C line introduced a risk of separation between Queensland and New South Wales. The local FCAS requirements in Queensland increased as a result to cover the loss of the remaining Armidale – Dumaresq 330 kV transmission line.

The target flow towards New South Wales across the QNI interconnector was limited to 350 MW between DIs ending 1805 and 1845 hrs by constraint equations F_Q++ARDM_L6 and F_Q++ARDM_L5. The constraint equations ensure sufficient Lower FCAS was available in Queensland in the event of a contingency. The Fast Lower service price in Queensland reached $13,256.5/MWh for DI ending 1830 hrs with the high FCAS requirement in Queensland. The Terranora interconnector was operating at reduced capacity due to the outage of two Directlink cables. The target flow across the interconnector was limited to 97 MW between DIs ending 1805 and 1845 hrs by constraint equation N_X_MBTE2_B which manages flow to Terranora load during the outage of two Directlink cables.

The energy price in New South Wales reduced to $43.79/MWh for DI ending 1850 hrs when demand reduced by 109 MW and 510 MW of generation capacity was rebid from higher priced bands to Market Floor Price (-$1000/MWh). The Fast Lower service price in Queensland reduced to $1.14/MWh for the same interval when the target flow towards New South Wales across QNI reduced to 236 MW.

The 1800 Pre-dispatch run predicted high spot prices in NSW and high FCAS price in Queensland for TIs ending 1830 and 1900 hrs.