Electricity Pricing Event Report – Tuesday 12 July 2016

Market Outcomes: Spot price in South Australia ranged between $951.26/MWh and $2,815.68/MWh for 6 trading intervals (TIs) between TIs ending 0900 hrs and 1830 hrs.

Energy prices in other NEM regions did not reach the price threshold for reporting purposes. FCAS prices in all regions were not affected by this event.

Actual Lack of Reserve Level 1 (LOR1) conditions had been declared for the South Australia region between 1830 hrs and 1930 hrs on 12 July 2016 (Market Notices 54458 and 54460).

Counter price flows caused negative settlement residues of approximately $141,000 to accumulate on the South Australia to Victoria directional interconnector between TIs ending 1600 hrs and 2100 hrs. AEMO managed negative residues from 1505 hrs to 1630 hrs and from 1800 hrs to 1900 hrs (Market Notices 54442, 54452, 54455 and 54457).

Detailed Analysis: For the high priced TIs, the 5-minute dispatch price in South Australia ranged between $578.81/MWh and the Market Price Cap (MPC) of $14,000/MWh for 15 dispatch intervals (DIs) between DIs ending 0845 hrs and 1830 hrs. These high prices can be mainly attributed to a planned network outage limiting Heywood interconnector flow, a steep supply curve in South Australia and planned generator outages.

The Tailem Bend West 275 kV Bus (including Tailem Bend to South East No 1 275 kV line) was on a planned outage between 0811 hrs on 04 July and 2039 hrs on 14 July. This planned outage reduced the interconnector capacity on the Heywood Interconnector. The outage constraint set S-TB_275KV_W_BUS was invoked during this period.

The transient stability constraint equation V::S_TB_275KV_W_B_1, within the constraint set S-TB_275KV_W_BUS, forced flow on the Heywood interconnector towards Victoria during the high priced DIs. This constraint equation prevents the transient instability across the VIC-SA cut-set for the loss of the South East - Tailem Bend No. 2 275 kV line, during the outage of the Tailem Bend West 275 kV Bus (including Tailem Bend – South East No. 1 275 kV line). For DIs ending 1825 hrs and 1830 hrs, the Heywood interconnector was also limited by the Negative Settlement Residue Management (NRM) constraint equation NRM_SA1_VIC1 and the thermal constraint equation S>>NIL_RBTU_WEWT. The S>>NIL_RBTU_WEWT system normal constraint equation prevents overload of the Waterloo East - Waterloo 132 kV line for the loss of the Robertstown - Tungkillo 275kV line. The target flow on the Heywood interconnector ranged between 133 MW and 216 MW towards Victoria during the high priced DIs.

The target flow towards South Australia on the Murraylink interconnector was limited up to 198 MW during the high priced DIs by the thermal constraint equation V^SML_NSWRB_2, the NRM constraint equation NRM_SA1_VIC1 and the upper transfer limit constraint equation VSML_220. The V^SML_NSWRB_2 constraint equation prevents voltage collapse in Victoria for loss of the Darlington Point – Buronga (X5) 220 kV line.

The maximum temperature in Adelaide was 12°C. The cold weather, in conjunction with high cloud cover, resulted in the South Australian demand remaining high following the morning peak, without the usual dip in the middle of the day associated with rooftop PV generation.

Several South Australian generating units were unavailable for the duration of the day, including Torrens Island A units 1, 2 and 4 (360 MW total) and Torrens Island B unit 4 (210 MW). In addition,

Pelican Point CCGT (510 MW) had been unavailable since 28 April 2016. Torrens Island A unit 3 (120 MW) was available from DI ending 1235 hrs.

South Australia wind generation was high, generating an average of 997 MW during the high price TIs. Between DIs ending 1435 hrs to 1535 hrs, some wind generators in South Australia experienced high wind speed cut-out of turbines due to extreme wind conditions.

For all high priced DIs, less than 300 MW of South Australian generation capacity was offered between $300/MWh and $13,000/MWh, resulting in a steep supply curve.

At 1135 hrs, 81 MW of generation capacity was shifted from bands priced at $301.30/MWh or below to bands priced at $13,998/MWh or above.

For DI ending 1535 hrs, 515 MW of generation capacity was shifted from the Market Floor Price (MFP of -$1,000/MWh to bands priced at $119.99/MWh or above.

Lower priced generation was available but required more than one DI to synchronise (Dry Creek GT unit 1, Port Lincoln GT units 1 and 3, Mintaro GT, Snuggery PS, Quarantine PS units 1, 2, 3, 4 and 5), was limited by ramp rates (Dry Creek GT unit 2, Torrens Island PS B units 1 and 2), was limited by fast start profiles (Dry Creek GT unit 2, Port Stanvac PS 1, Angaston PS, Lonsdale PS, Snuggery PS) or was constrained off by the transient stability constraint equation V::S_TB_275KV_W_B_1 (Lake Bonney 2 and 3 wind farms) or the thermal constraint equation S>>NIL_RBTU_WEWT (Waterloo WF).

For the DIs subsequent to the high priced DIs, the 5-minute price reduced to $201.42/MWh or below, when up to 860 MW of generation capacity was rebid from bands priced at $124.99/MWh or above to the MFP.

The 5-minute price in South Australia reduced to -$987.68/MWh or below for 7 DIs between DIs ending 1520 hrs and 1600 hrs, when up to 941 MW of generation capacity was rebid from higher priced bands to the MFP. For DI ending 1605 hrs, the 5-minute price in South Australia returned to $301.30/MWh when 965 MW of generation capacity was rebid or shifted from the MFP to bands priced at $124.99/MWh or above.

Due to the counter-price flow on the South Australia to Victoria directional interconnector, the NRM constraint equation NRM_SA1_VIC1 was invoked for 29 DIs between DIs ending 1510 hrs and 1900 hrs. The counter price flows were a result of the outage constraint equation V::S_TB_275KV_W_B_1 forcing flow towards Victoria across the Heywood interconnector. The NRM constraint bound for 23 DIs during this period.

The high prices between DI ending 0900 hrs and 1830 hrs were not forecast in the latest Pre-dispatch schedules, due to the low demand and high wind generation forecasts in the Pre-dispatch runs.