Electricity Pricing Event Report – Monday 01 August 2016

Market Outcomes: Spot price in South Australia reached $4,772.49/MWh for trading interval (TI) ending 0930 hrs.

Energy prices in other regions and FCAS prices in all regions were not affected by this event.

Detailed Analysis: The 5-Minute dispatch price in South Australia reached $13,998.99/MWh for dispatch intervals (DIs) ending 0910 hrs and 0915 hrs. These high prices can be mainly attributed to planned network outages, a reduction in availability of lower priced generation, limited interconnector support and tight supply in South Australia, during the morning peak demand period.

Planned outage of the Penola West – South East 132 kV line was scheduled between 0809 hrs and 1004 hrs on 1 August 2016. Outage constraint set S-PWSE_2 was invoked for the duration for the outage.

Demand reached the morning peak of 1,738 MW at DI ending 0900 hrs. For the high priced DIs, ending 0910 hrs and 0915 hrs, demand was 1,732 MW and 1,733 MW, respectively. Wind generation in South Australia was 339 MW and 325 MW, respectively, for the same DIs.

A number of generating units were unavailable during the day, including Torrens Island A units 1, 3 and 4 (total maximum capacity of 360 MW), Torrens Island B unit 2 (maximum capacity 210 MW) and Pelican Point CCGT (maximum capacity 510 MW, however up to 235 MW was available over July 2016). Additionally, Torrens Island B unit 3 had only 14 MW available (generally 200 MW available). For the high priced DIs, the majority of available South Australian units were generating at or close to their maximum availability.

Between DIs ending 0905 hrs and 0910 hrs, wind generation in South Australia decreased by 44 MW, from 383 MW to 339 MW.

For DI ending 0910 hrs, the target flow towards South Australia on the Heywood interconnector was at 365 MW, which violated the limit of 364.74 MW set by the transient stability constraint equation V::S_NIL_TBSE_2. This constraint equation prevents transient instability across the VIC – SA cut-set for the loss of one of the Tailem Bend – South East 275 kV lines (both Black Range series capacitors unavailable). For DI ending 0910 hrs, the target flow towards South Australia on the Murraylink interconnector was limited to 187 MW by the thermal constraint equation V>S_NWRB2_NWRB1. This constraint equation limits the flow towards South Australia on Murraylink to prevent overload of Robertstown – North West Bend No 1 132 kV line, during the outage of the Robertstown – North West Bend No 2 132 kV line.

Following the commencement of the Penola West – South East 132 kV line planned outage at 0809 hrs, Ladbroke Grove GT units 1 and 2 were observed to be oscillating. Between 0809 hrs and 0915 hrs, each unit was oscillating with a magnitude of +/- 5 MW around a generation target of 43 MW. For DI ending 0915 hrs, the discretionary constraint equation #SA1_E_20160801 was invoked. This constraint equation limits output from Ladbroke Grove GT units 1 and 2 to 0 MW. Between DIs ending 0910 hrs and 0915 hrs, wind generation reduced by a further 14 MW.

The reduction in wind generation and available generation from Ladbroke Grove during the morning peak demand resulted in a tight supply situation in South Australia. Due to the tight supply, target flow towards South Australia on the Heywood interconnector increased and Ladbroke Grove GT units 1 and 2 were dispatched above the 0 MW limit set by the discretionary constraint equation, #SA1_E_20160801. This caused the constraint equations #SA1_E_20160801 and S>>PWSE_SETB_SETB_2 to violate for DI ending 0915 hrs. The S>>PWSE_SETB_SETB_2 constraint

equation prevents overload of either Tailem Bend – South East 275 kV line for the loss of the parallel line, during the outage of the Penola West – South East 132 kV line.

For DI ending 0915 hrs, the target flow towards South Australia on the Heywood interconnector increased to 402 MW, which violated the limit of 388.52 MW set by the thermal constraint equation S>>PWSE_SETB_SETB_2. The target flow towards South Australia on the Murraylink interconnector was limited to 188 MW by the thermal constraint equation V>S_NWRB2_NWRB1.

For DIs ending 0910 hrs and 0915 hrs, lower priced generation was available, however was limited by ramp rates (Hallet PS, Torrens Island B unit 3, Dry Creek GT units 2 and 3, Snuggery PS), or required more than one DI to synchronise (Snuggery PS, Dry Creek GT unit 3, Quarantine PS unit 5). For DI ending 0915 hrs and 0920 hrs, Hallet GT was generating below their dispatch target, resulting in a deficit of 60 MW in South Australia.

The 5-minute price reduced to $90.49/MWh for DI ending 0920 hrs, when Lumo Generation rebid 83 MW of generation capacity from bands priced at $13,999.99/MWh or above to the Market Floor Price (MFP) of -$1,000/MWh. The increased availability of lower priced generation in South Australia reduced the flow towards South Australia on the Heywood and Murraylink interconnectors, which prevented the S>>PWSE_SETB_SETB_2 constraint equation from violating and the V>S_NWRB2_NWRB1 constraint equation from binding.

The constraint equations #SA1_E_20160801 violated for DI ending 0920 hrs as Ladbroke Grove GT units 1 and 2 were limited by their ramp down rates. This constraint equation ceased violating at DI ending 0925 hrs, when the dispatch target for Ladbroke units 1 and 2 reduced to 0 MW.

The high 30-minute spot price was not forecast in any of the pre-dispatch schedules, as it was due to the reduction in generation availability within the trading interval.