

Electricity Pricing Event Report – Tuesday 22 November 2016 to Saturday 26 November 2016

Market Outcomes: South Australia Raise Regulation Frequency Control Ancillary Service (FCAS) price ranged between \$300.03/MWh and \$10,997.33/MWh for 40 trading intervals (TIs) between TIs ending 0730 hrs on 22 November 2016 and 1000 hrs on 26 November 2016. South Australia Lower Regulation FCAS price ranged between \$300.01/MWh and \$11,014.17/MWh for 99 TIs over the same period.

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

Actual Lack of Reserve Level 2 (LOR2) condition had been declared for the South Australia region between 0715 hrs on 22 November 2016 and 1000 hrs on 26 November 2016 (Market Notice 55810 and 55843). During these LOR2 periods, there were sufficient capacity reserves in the South Australia region to meet electricity demand. However, in the event of a credible contingency, whereby South Australia separated from Victoria, power interruptions would have been likely, due to automatic under-frequency load shedding.

At 1135 hrs on 25 November 2016, the rolling sum of Raise Regulation FCAS price for the South Australia region for the previous 2,016 dispatch intervals (DIs) exceeded six times the cumulative price threshold (CPT) of \$210,100. As a result, an administered price cap (APC) of \$300/MWh was applied to all ancillary service prices in South Australia between DIs ending 1140 hrs on 25 November 2016 and 0400 hrs on 3 December 2016 (Market Notices 55840 and 56132).

Detailed Analysis: The 5-minute Regulation FCAS prices in South Australia reached between \$11,000/MWh and \$11,005.92/MWh for DIs ending 1005 hrs and 1035 hrs on 23 November 2016. Between DIs ending 0405 hrs and 1135 hrs on 25 November 2016 the 5-minute Regulation FCAS prices in South Australia ranged between \$7,980/MWh and \$11,030.16/MWh. For all other DIs between DIs ending 0705 hrs on 22 November and 1000 hrs on 26 November, Regulation FCAS prices were elevated, ranging between \$48/MWh and \$1,599.98/MWh. These high prices were mainly attributed to increased Regulation FCAS requirements within South Australia during a planned outage of Heywood - South East No.1 275 kV line and limited availability of lower priced Regulation FCAS in South Australia.

The Heywood - South East No.1 275 kV line was on a planned outage between 0701 hrs on 22 November 2016 and 0954 hrs on 26 November 2016. This outage increased the risk of synchronous separation between South Australia and Victoria. The outage constraint sets F-I-HYSE, I-HYSE, V-HYTX_M12 and S-X_BC_CP were invoked for the duration of the outage. The constraint equations F-S_LREG_0035 and F-S_RREG_0035 contained within the F-I-HYSE constraint set required 35 MW of Lower and Raise Regulation FCAS capacity to be sourced from within South Australia.

Regulation FCAS in South Australia during the outage period was provided by Torrens Island B PS, Quarantine PS, Pelican Point PS and Osborne PS.

For DI ending 1005 hrs and 1035 hrs on 23 November 2016, AGL shifted 8 MW of Regulation FCAS from bands priced at \$48/MWh to bands priced at the market price cap (MPC) of \$14,000/MWh. As a result, higher priced Regulation FCAS services had to be enabled for these DIs to meet the 35 MW Regulation FCAS requirements. Lower priced capacity was available from Torrens Island B unit 4 however the Automatic Generation Control (AGC) status from the power station indicated the unit being unavailable to provide Regulation services for the DIs. For DI ending 1040 hrs the Raise and Lower Regulation FCAS prices reduced to \$299.99/MWh when AGL rebid 8 MW of Regulation FCAS availability from bands priced at \$13,980.43/MWh to \$47.93/MWh and the AGC status of Torrens B PS unit 4 changed from unavailable to available.

For DI ending 0405 hrs on 25 November 2016, Origin Energy rebid 2 MW of Raise and Lower Regulation FCAS capacity from price band \$0/MWh to \$10,984.00/MWh. Additional Raise and Lower Regulation FCAS had to be sourced from the more expensive price bands. Consequently, the 5-minute Raise and Lower Regulation FCAS price ranged between \$7,980/MWh and \$11,030.16/MWh between DI ending 0405 hrs and 1135 hrs on 25 November 2016.

By DI ending 1135 hrs on 25 November 2016, the prolonged high prices caused rolling sum of Raise Regulation FCAS prices in the South Australia region for the previous 2,016 DIs to exceed six times the CPT, thus triggering an Administered Price Period (APP). An APC of \$300/MWh was applied to all ancillary service prices for the South Australia region from DI ending 1140 hrs on 25 November 2016.

On 26 November 2016, the APC continued to apply as the cumulative sum of both Lower and Raise Regulation FCAS prices remained above the CPT. Regulation FCAS prices ranged between \$48/MWh and \$300/MWh for all DIs following the commencement of APP until the completion of the Heywood to South East No.1 275 kV line outage on 26 November 2016. The APC was revoked at 0400 hrs on 3 December 2016.

For DI ending 1005 hrs on 26 November 2016, the Raise and Lower Regulation FCAS prices reduced to \$7.4/MWh and \$5/MWh, respectively, when the outage constraint set F-I-HYSE was revoked following completion of the outage.

The high Regulation FCAS prices were forecast in the latest pre-dispatch schedule.