

Electricity Pricing Event Report – Monday 23 January 2017

Market Outcomes: South Australia (SA) Energy spot price reached \$2,458.04/MWh for trading interval (TI) ending 0530 hrs.

SA Raise Regulation Frequency Control Ancillary Service (FCAS) prices was high, reaching \$4,671.60/MWh and \$9,921.41/MWh for TIs ending 0530 hrs and 0600 hrs, respectively. SA Lower Regulation FCAS prices was also high, reaching \$6,904.69/MWh and \$9,234.86/MWh for TIs ending 0530 hrs and 0600 hrs, respectively.

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

Actual Lack of Reserve Level 2 (LOR2) conditions had been declared for the SA region between 0508 hrs and 0730 hrs on 23 January 2017 (Market Notices 56983 and 56985) due to an unplanned outage of the APD – Heywood – Mortlake No.2 500kV line in Victoria (VIC). During the LOR2 period, there were sufficient capacity reserves in the SA region to meet electricity demand. However in the event of a credible contingency, whereby SA separated from the rest of the NEM, power interruptions would have been likely as it may not have been possible to bring the required additional capacity into service in time to avoid automatic under-frequency load shedding.

Detailed Analysis: The 5-minute Energy dispatch price reached the Market Price Cap (MPC) of \$14,000/MWh in SA for dispatch interval (DI) ending 0520 hrs. This high Energy price is mainly attributed to limited interconnector support caused by the unplanned outage of APD – Heywood – Mortlake No.2 500kV line.

The 5-minute SA Raise Regulation FCAS prices reached the MPC for all DIs between DIs ending 0525 hrs and 0550 hrs. The 5-minute SA Lower Regulation FCAS prices ranged between \$13,799.99/MWh and \$13,859.18/MWh for all DIs between DIs ending 0520 hrs and 0550 hrs. These high FCAS prices can be mainly attributed to the application of local Regulation FCAS requirements within SA during the unplanned outage of APD – Heywood – Mortlake No.2 500kV line.

The SA wind generation was approximately 333.6 MW for the high priced TI ending 0530 hrs.

For the high energy priced DI, cheaper priced generation was available but limited due to ramp rates (Osborne GT, Torrens A unit 1, 2 and 4 and Torrens B unit 2 and 4) or required more than one DI to synchronise (Hallet GT, Dry Creek GT unit 3 and Snuggery GT).

APD – Heywood – Mortlake No.2 500kV line had an unplanned outage between 0508 hrs and 0718 hrs on 23 January 2017. This outage increased the risk of separation between SA and VIC, and the associate outage constraint sets F-V-HYMO, S-X_BC_CP, V-HYMO were invoked for the duration of the outage. The constraint equations F_S+LREG_0035 and F_S+RREG_0035 contained within the F-V-HYMO constraint set required 35 MW of Lower and Raise Regulation FCAS capacity to be sourced from within SA.

Between DIs ending 0515 hrs and 0520 hrs, the sum of the target flow on the interconnectors towards SA decreased by 213 MW to 471 MW. For DI ending 0520 hrs, the target flow towards SA on the Heywood interconnector was at 282 MW, which violated the limit of 225 MW set by the dynamic upper transfer limit constraint equation VS_250_DYN. This constraint equation is part of the constraint set V-HYMO which was invoked to manage the APD – Heywood – Mortlake No.2 500kV line outage, and limits the dynamic headroom for the upper transfer limit on the VIC to SA Heywood interconnector to 250 MW. Once the 250 MW flow limit is exceeded by more than 10 MW, the limit is temporarily reduced by the amount of exceedance.

The target flow towards SA on the Murraylink interconnector was limited to 189 MW by the Rate of Change of Frequency (RoCoF) constraint equation VSML_ROC_80. This constraint limits the rate of change on the Murraylink interconnectors to 80 MW per 5 Minutes.

For DI ending 0520 hrs, additional generation had to be sourced from Torrens Island A and B due to the decrease in interconnector flow. The increased dispatch in the Energy market reduced Torrens Island B unit 2 and 4 availability in the Raise Regulation FCAS market to zero. For this DI, the output from Torrens Island A PS unit 1, 2 and 4 were also below the unit's Regulation FCAS trapezium minimum enablement limit of 50 MW. As a result, these units were stranded (unavailable) for Regulation FCAS. This violated the F_S+RREG_0035 constraint equation (requirement of having 35 MW of local Raise Regulation in SA) as there was no Raise Regulation capacity available in SA. From DI ending 0525 hrs, the SA Raise Regulation FCAS prices reached up to the MPC as no cheaper Raise Regulation FCAS was available. The SA Lower Regulation FCAS prices were also high from DI ending 0520 hrs as no cheaper Lower Regulation FCAS was available.

For DI ending 0525 hrs, the 5-minute Energy price reduced to \$484.99/MWh when Engie and Snowy Hydro rebid 207 MW of generation capacity from higher price bands to the Market Floor Price (MFP) of -\$1,000/MWh.

For DI ending 0555 hrs, the 5-minute Raise and Lower Regulation FCAS prices reduced \$1,950.03 and \$75/MWh, respectively, when Origin (Osborne GT) made 10 MW available in both the Raise and Lower Regulation FCAS market.

The high 30-minute spot price for SA was not forecast in the pre-dispatch schedules as a result of the unplanned outage. The high FCAS prices were forecast in pre-dispatch schedules published from the 0600 hrs run on 23 January 2016.