

Electricity Pricing Event Report - Wednesday 27 February 2017

Market Outcomes: South Australia (SA) Energy spot price reached \$2,380.81/MWh and Lower Regulation Frequency Control Ancillary Service (FCAS) price reached \$2,317.20/MWh for trading interval (TI) ending 0500 hrs.

Energy and FCAS 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 0445 hrs and 0609 hrs on 27 February 2017 (Market Notices 57714 and 57716) 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 and the Lower Regulation FCAS price reached \$13,799.99/MWh in SA for dispatch interval (DI) ending 0500 hrs. The high Energy price and Lower Regulation FCAS price can be attributed to constrained interconnector flow and a stranded thermal unit, respectively, during times of limited lower priced generation capacity and a local requirement for Regulation FCAS.

The APD - Heywood – Mortlake No.2. 500kV line had an unplanned outage between 0445 hrs and 0609 hrs on 27 February 2017. This outage increased the risk of separation between SA and VIC, and the associated outage constraint sets F-V-HYMO, S-X_BC_CP and V-HYMO were invoked between DIs ending 0455hrs and 0620 hrs. 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.

For DI ending 0455 hrs, the target flow on the Heywood interconnector was 550 MW towards South Australia. For DI ending 0500 hrs the target flow reduced to 277 MW towards South Australia, exceeding the export limit of 210.88 MW set by the V_S_ROCOF constraint equation. This Rate of Change of Frequency (RoCoF) constraint limits the flow on the Heywood interconnector from VIC to SA to prevent the RoCoF exceeding 1Hz/sec in SA following separation while SA is at credible risk of separation from the NEM. The limit is calculated based on online inertia in SA.

Lower priced Energy generation was available but required more than one DI to synchronise (Hallet GT and Snuggery GT) or limited by Ramp rates (Torrens Island B unit 1, 3 and 4).

For DI ending 0500 hrs, Torrens Island unit B4 was stranded and unable to provide Lower Regulation FCAS. This required the 35 MW of locally sourced Lower Regulation FCAS to be sourced from higher priced generators (Torrens Island B units 1 and 3).

There was no Raise Regulation FCAS available for DI ending 0500 hrs, causing the F_S+RREG_0035 constraint equation to violate.

The 5- minute Energy Price reduced to \$349.98/MWh and Lower Regulation FCAS reduced to \$75/MWh for DI ending 0505 hrs when lower priced generation capacity became available and Torrens Island B unit 4 was no longer stranded and able to provide lower priced Lower Regulation FCAS. Additionally, Raise Regulation FCAS capacity became available and the constraint equation F_S+RREG_0035 was no longer violating.

These 30-minute high Energy and Lower Regulation FCAS prices were not forecast in pre-dispatch schedules as they occurred due to an unplanned outage.