Electricity Pricing Event Report – Thursday 14 September 2017

Market Outcomes: The spot price in South Australia (SA) reached -$122.61/MWh and -$295.82/MWh for Trading Intervals (TIs) ending 1130 hrs and 1200 hrs, respectively.

The SA Raise Regulation Frequency Control Ancillary Service (FCAS) prices reached between $10,969.69/MWh and $11,508.08/MWh for all TIs ending between 0900 hrs and 1630 hrs. The SA Lower Regulation FCAS prices reached between $10,969.69/MWh and $11,509.23/MWh for all TIs ending between TI ending 0900 hrs and TI ending 1630 hrs.

The SA Lower 6 second contingency FCAS price reached $314.91/MWh for TI ending 1200 hrs.

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

Detailed Analysis:

Low energy prices

The 5-min dispatch energy price in SA reached -$999.999/MWh or the Market Floor Price (MFP) of -$1,000/MWh for dispatch intervals (DIs) ending 1115 hrs, 1150 hrs and 1200 hrs. These low prices can mainly be attributed to an excess supply of lower priced generation in South Australia (SA) and mild demand during a planned protection outage in Victoria (VIC).

The South East 275kV Loss of Synchronism protection relay had a planned outage between 0830 hrs and 1802 hrs on the 14 September 2017. This outage caused an increased risk of tripping both the South East – Heywood No.1 and No.2 275kV lines, with the simultaneous trip of both these lines being reclassified as a credible contingency event (MN 59179). Accordingly, there was an increased risk of separation between SA and VIC, and the associated outage constraint sets F-I-HYSE, I-HYSE_N-2 and I-VS_050 were invoked between DIs ending 0835 hrs and 1815 hrs. The constraint equations F_S++HYSE_L6_1 and F_S++HYSE_L60 contained within the F-I-HYSE constraint set restricted Heywood interconnector import flows from SA to VIC between 40.4 MW and 73.7 MW during the outage.

Target flow on the Heywood interconnector was 56 MW towards VIC for all low priced DIs, due to constraint equations F_S++HYSE_L6_1 and F_S++HYSE_L60, contained within the F-I-HYSE constraint set. Target flow on Murraylink interconnector ranged between 173 MW and 174 MW towards VIC during the low priced DIs, due to constraint equation S>V_NIL_NIL_RBNW. The F_S++HYSE_L6_1 FCAS constraint equation requires local Lower 6 second FCAS to be sourced from within SA, when SA is at a credible risk of islanding. The F_S++HYSE_L60_1 FCAS constraint equation requires local Lower 60 second FCAS to be sourced from within SA, when SA is at a credible risk of islanding. The S>V_NIL_NIL_RBNW system normal thermal constraint equation avoids overloading on the Robertstown – North West Bend No.1 or No.2 132kV lines.

During the low priced TIs, SA wind generation was high (reaching over 1,100MW) and SA operational demand was mild (not exceeding 1,410MW). This resulted in excess cheaper priced generation in SA, whilst interconnector flows towards VIC were constrained. During the low priced DIs, higher priced generation was dispatched due to ramp down rates (Lake Bonney 2 and 3).

The 5-minute energy price in SA increased to -$80.00/MWh or above for all DIs following the low priced DIs, when demand in the SA region increased by up to 73 MW and up to 109MW of volume was rebid from the MFP to band priced at -$80.00/MWh and above.

The low negative spot prices were not forecast in the pre-dispatch schedules due to demand being lower than forecast.

High FCAS prices

The 5-minute dispatch Raise and Lower Regulation Frequency Control Ancillary Service (FCAS) price in SA reached between $10,969.69/MWh and the Market Price Cap (MPC) of $14,200/MWh for all DIs between DI ending 0835 hrs and DI ending 1630 hrs. In addition, the 5-min dispatch Lower 6 second FCAS price in SA reached $900.43/MWh and $901.12/MWh for DIs ending 1150 hrs and 1200 hrs, respectively. The high Regulation FCAS prices can mainly be attributed to local Regulation requirements within SA during a planned outage. The high contingency Lower FCAS prices can be attributed to the trade-off between the FCAS and energy markets, during a period of low energy prices.

The constraint equations F_S+RREG_0035 and F_S+LREG_0035 contained within the F-I-HYSE constraint set required 35 MW of Raise and Lower Regulation FCAS capacity to be sourced from within SA. Additionally, the constraint equation F_S++HYSE_L6_1 contained within the F-I-HYSE constraint set required local Lower 6 second Contingency FCAS capacity to be sourced from within SA.

Raise and Lower Regulation FCAS in SA during the outage period was provided by Torrens Island, Osborne PS and Pelican Point PS. Lower priced Regulation FCAS was available from Pelican Point PS for DI ending 0945 hrs but was limited by its FCAS trapezium, causing the Regulation FCAS price to reach the MPC.

During the higher priced Lower 6 second FCAS DIs, Lower 6 second FCAS capacity was provided by Torrens Island. The high Lower FCAS prices were due to the balancing between the FCAS and energy markets, during DIs with low energy prices.

The 5-minute Raise and Lower Regulation FCAS prices in SA reduced to $276.69/MWh for DI ending 1635 hrs. This occurred when AGL rebid 24 MW of both Raise and Lower Regulation capacity from band priced at the MPC to $75/MWh and $299.99/MWh price bands with bid reason: "*1125~A~040 CHG IN AEMO DISP~45 PRICE INCREASE VS PD RAISEREG AND LOWERREG SA $14200 VS $10969*".

The high Raise and Lower Regulation FCAS trading prices for SA were forecast in the pre-dispatch schedule. The high 30 minute Lower 6 second FCAS trading price was not forecast in the pre-dispatch schedules, as it was a result of balancing the FCAS and energy markets.

Version Control

VER	DATE	REVISION DESCRIPTION	AUTHOR	CHECKED	RESPONSIBLE MANAGER	APPROVED
v1	08/12/2017	Original Document	Petar Pantic	Ori Agranat	Chris Muffett	