NEMMCO

Dispatch Anomaly –

5 May 2009

Prepared by: Market Operations Performance

Background

NEMMCO has found that incorrect Raise Regulation Frequency Control Ancillary Service (FCAS) and 5-Minute Raise FCAS were dispatched, due to an incorrect time error reading feeding into a dynamic regulation FCAS constraint. This affected the dispatch outcome of the two dispatch intervals (DIs) 15:15hrs and 15:20hrs on 5 May 2009.

Event Detail

At 07:30hrs on Tuesday 5 May 2009, the NEMMCO's Queensland control centre experienced a loss of power due to damage to underground power cables, and supply for operations was switched to back-up diesel generation. There is one "Truetime" clock connected to each of the two supply transformers at the control centre to measure the Queensland frequency and derive the synchronous time error. Despite the cable faults, one frequency meter operated correctly as it was fed from a single phase connection that remained in service on one of the transformers.

At 15:08hrs the incoming supply was disconnected to work on the damaged AC cable. This caused the loss of the remaining frequency meter that was fed from the single phase connection. The Queensland time error reading defaulted to -99.99 seconds.

The Queensland time error is an input in the constraint equation F_I+NIL_DYN_Reg. The constraint equation manages the negative time error in the NEM, by ensuring that the (global) NEM Raise Regulation Requirement is increased by 60 MW for each second of time error below a threshold of -1.5 seconds. The global Raise Regulation requirement (Figure 1) increased significantly from approximately 167MW to its maximum limit of 250MW. The global Raise 5 Minute enablement decreased (Figure 2) from 454MW to 370MW as shown below, due to the co-optimisation of Raise Regulation and 5 Minute Raise Requirements that was introduced from 1 January 2009.
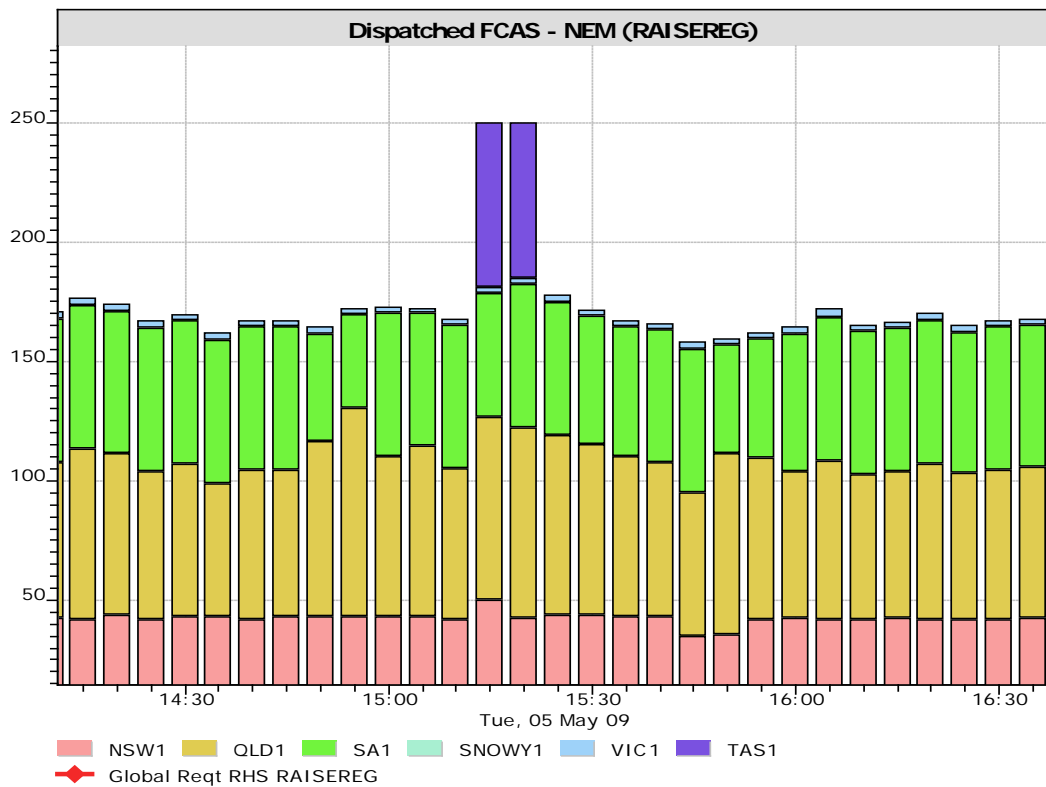
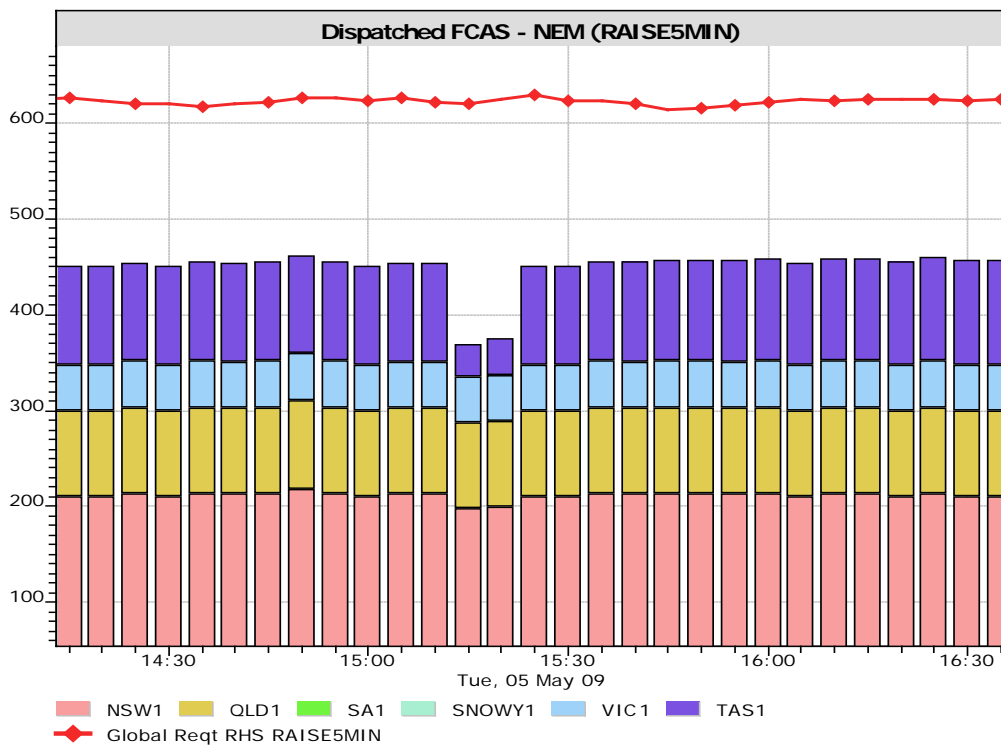**Figure 1: Raise Regulation FCAS enablement in MW**

Figure 2: Raise 5-Min FCAS enablement in MW

NEMMCO hand dressed the incorrect time error to zero seconds in the Energy Management System so that the Raise Regulation and 5-Minute Raise FCAS dispatched from DI 15:25hrs were correct. At 15:55hrs, Energy Management System (EMS) staff replaced the hand dressed time error with the time error from NEMMCO's co-primary control site.

The FCAS prices for the Mainland from DI 15:00hrs to 15:40hrs are listed in Table 1.

Time	RAISE REG: NEM ($/MWh)	RAISE 5-MIN: NEM ($/MWh)
15:00	0.94	0.94
15:05	0.94	0.94
15:10	0.94	0.94
15:15	1.25	0.59
15:20	0.94	0.59
15:25	0.94	0.94
15:30	0.94	0.94
15:35	0.94	0.94
15:40	0.94	0.94

Table 1

From these figures, the incorrect time error input had no material impact on FCAS prices for the NEM region. Energy prices were also unaffected.

It is considered that NEMMCO acted in accordance with its established procedures in recognising the time error and the effect it has on the Raise Regulation and 5-Minute Raise FCAS requirements. Corrective action was taken when the problem was confirmed. Accordingly, NEMMCO is not declaring it to be a scheduling error.

Conclusion

NEMMCO identified 2 DIs on 5 May 2009 where incorrect global Raise Regulation and 5-Minute Raise FCAS were dispatched, due to an incorrect time error reading feeding into a dynamic regulation FCAS constraint.

Corrective action was taken quickly by hand dressing the time error to zero seconds. NEMMCO replaced this value by the correct time error from its co-primary control site.

The incorrect time error input had no material impact on FCAS or energy prices for the NEM region.

NEMMCO has reviewed this incident and identified options for improvement. Reasonability limits of time error measurements have been applied so that any future failure will cause the measurement to be flagged as suspect. Suspect values are automatically replaced with the last good value pending control room action to apply an alternative input. Alternative SCADA inputs for the Queensland frequency and time error have been identified and are to be made available to the Energy Management System.