

HIGH DEMAND EVENT REPORT – 28 JAN 2014 (VICTORIA AND SOUTH AUSTRALIA)

PREPARED BY: Systems Capability

VERSION: 1

DATE: 31 January 2014

FINAL

Contents

| | | |
|-------|--------------------------|----|
| 1 | Background | 3 |
| 2 | Introduction | 3 |
| 2.1 | High demand events | 3 |
| 3 | Findings | 3 |
| 3.1 | Key findings..... | 3 |
| 3.2 | Detailed findings..... | 3 |
| 3.2.1 | Key observations..... | 3 |
| 4 | Appendix A..... | 4 |
| 5 | Appendix B..... | 6 |
| 6 | Appendix C..... | 9 |
| 7 | Appendix D..... | 11 |
| 8 | Glossary | 12 |

1 Background

This report is an initial summary of system and market data observed during a high-demand event. It provides a preliminary assessment of the impact of this event on the Victorian and South Australian regions of the National Electricity Market (NEM).

2 Introduction

2.1 High demand events

For the purposes of reporting on high demand events during the period of summer 2013-14, a high-demand event is defined as an event that results in:

- Operational demand in Victoria of greater than 10,000 MW, or
- Operational demand in South Australia of greater than 3,000 MW.

3 Findings

3.1 Key findings

Key findings from the high-demand event of Tuesday 28 January 2014 were:

- Maximum operational demand in Victoria was 10,313 MW (peak demand for Victoria was 10,494 MW on Thurs 29 Jan 2009).
- Maximum operational demand in South Australia was 3,002 MW (peak demand for South Australia was 3,399 MW on Mon 31 Jan 2011).
- The power system experienced one event (see Appendix D).

3.2 Detailed findings

Data, graphs and tables are supplied at Appendices A to D.

3.2.1 Key observations

- Maximum operational demand of 10,313 MW on 28 January in Victoria was the highest recorded this summer to date.
- Supply was sufficient to meet demand through the day in both regions.
- There were discrepancies in the Victorian forecast demand due to the temperature at the time of the demand forecast (1800 hrs previous day) being 4.8 °C lower than the actual temperature experienced on the day.
- In Victoria, generation sources other than brown coal fired generators were not dispatched until demand exceeded approximately 6,000 MW.
- In South Australia, wind provided 15% of generation at the time of maximum operational demand (3,002 MW).
- There were no known bushfire threats to transmission assets.

4 Appendix A

VICTORIA & SOUTH AUSTRALIA High Demand Event

Summary of Operational and Market Data

| Observations | Tuesday | Typical day in Jan |
|---|------------------|--------------------|
| | 28 Jan 2014 | |
| VIC region peak record demand was 10,494 MW on 29 Jan 2009 | | |
| Melbourne CBD Minimum Temperature (°C) | 24.5 | 12.2 |
| Melbourne CBD Maximum Temperature (°C) | 42.0 | 29.1 |
| Melbourne CBD Average Temperature (°C) | 33.3 | 20.7 |
| VIC Actual Maximum Operational Demand (MW) | 10,313 | 6,643 |
| VIC Reserves at the time of Maximum Operational Demand (MW) | 1,337 | 4,785 |
| VIC Minimum Reserves (MW) | 1,337 (1630 hrs) | 4,785 (1630 hrs) |
| Time of VIC Maximum Operational Demand (Market time) | 1630 hrs | 1630 hrs |
| VIC Forecast Maximum Operational Demand (MW) ¹ | 9,046 (1630 hrs) | 6,925 (1630 hrs) |
| Price at the time of Maximum Operational Demand (\$/MWh) | \$135.31 | \$47.14 |
| Maximum Spot Price (\$/MWh) | \$704.68 | \$49.76 |
| Time of Maximum Spot Price (Market time) # | 1700 hrs | 0700 hrs |
| Minimum Spot Price (\$/MWh) | \$37.32 | \$42.69 |
| Time of Minimum Spot Price (Market time) # | 0300 hrs | 0230 hrs |
| SA region peak record demand was 3,399 MW on 31 Jan 2011 | | |
| Adelaide CBD Minimum Temperature (°C) | 20.3 | 15.5 |
| Adelaide CBD Maximum Temperature (°C) | 43.0 | 30.6 |
| Adelaide CBD Average Temperature (°C) | 31.7 | 23.1 |
| SA Actual Maximum Operational Demand (MW) | 3,002 | 2,011 |
| SA Reserves at the time of Maximum Operational Demand (MW) | 531 | 1,421 |
| SA Minimum Reserves (MW) | 504 (1630 hrs) | 1,415 (1700 hrs) |
| Time of SA Maximum Operational Demand (Market time) | 1700 hrs | 1730 hrs |
| SA Forecast Maximum Operational Demand (MW) ¹ | 2,955 (1700 hrs) | 1,852 (1700 hrs) |

| | | |
|--|----------|----------|
| Price at the time of Maximum Operational Demand (\$/MWh) | \$739.89 | \$53.30 |
| Maximum Spot Price (\$/MWh) | \$739.89 | \$56.48 |
| Time of Maximum Spot Price (Market time) # | 1700 hrs | 1600 hrs |
| Minimum Spot Price (\$/MWh) | \$39.24 | \$44.43 |
| Time of Minimum Spot Price (Market time) # | 0500 hrs | 0230 hrs |

Weather observations sourced from AEMO's weather service provider

Notes:

1. Forecast Operational Demand published by Demand Forecasting System (DFS) at 1800 hrs the day before (e.g.: for 28 Jan 2014 this was published by DFS on 27 Jan 2014 at 1800 hrs).

Is based on the time period (0000 hrs - 2359 hrs.)

All data is recorded at National Electricity Market Time (GMT +10:00 hrs)

MW: Megawatt

MWh: Megawatt hours

\$/MWh: Dollars per Megawatt hour

Operational Demand = Demand met by Scheduled+Semi-Scheduled+Non-Scheduled Wind Generations (aggregate capacity \geq 30 MW).

Interconnectors: The maximum Operational Import parameters on the following interconnectors are as detailed below:

- VIC-NSW total import to VIC: 1700 MW (include Murray generation)
- VIC-SA total import to VIC: 680 MW(460 MW on Heywood & 220 MW on Murraylink), VIC-SA total import to SA: 680 MW(460 MW on Heywood & 220 MW on Murraylink)
- VIC-TAS total import to VIC: 594 MW

Note: The above parameters are the maximum imports that could be fed into VIC however, there are certain constraints that would limit these imports i.e. thermal, voltage collapse, Frequency Control Ancillary Services (FCAS).

5 Appendix B

VICTORIA & SOUTH AUSTRALIA High Demand Event

Contribution to Operational Demand

| Victoria | Tuesday |
|--|-------------|
| | 28 Jan 2014 |
| Time of VIC Maximum Operational Demand (Market Time) | 1630 hrs |
| VIC Actual Maximum Operational Demand (MW) | 10,313 |
| Wind Generation in Victoria (MW) | 554 |
| Hydro Generation in Victoria (MW) | 1,583 |
| Gas Generation in Victoria (MW) | 1,689 |
| Brown Coal Generation in Victoria (MW) | 5,478 |
| Total Interconnector imports (MW) | 1,010 |
| South Australia | |
| Time of SA Maximum Operational Demand (Market Time) | 1700 hrs |
| SA Actual Maximum Operational Demand (MW) | 3,002 |
| Wind Generation in SA (MW) | 440 |
| Diesel Generation in SA (MW) | 6 |
| Gas Generation in SA (MW) | 2,089 |
| Brown Coal Generation in SA (MW) | 453 |
| Total Interconnector imports (MW) | 14 |

Notes:

All data is recorded at National Electricity Market Time (GMT + 10:00 hrs)

MW: Megawatt

Figure B1 indicates generation contribution to operational demand for Tuesday 28 January 2014 in Victoria

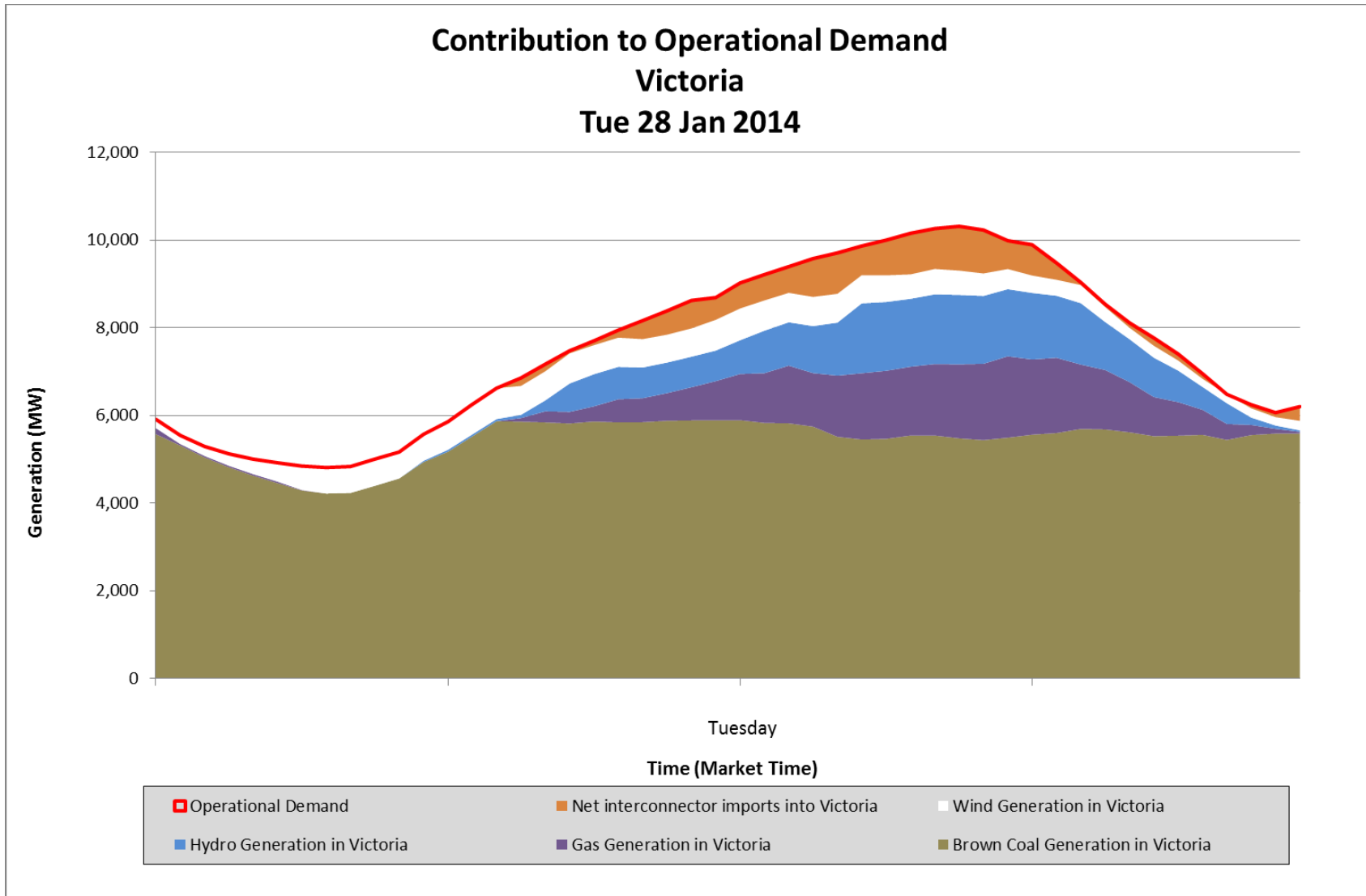


Figure B1

Figure B2 indicates generation contribution to operational demand for Tuesday 28 January 2014 in South Australia

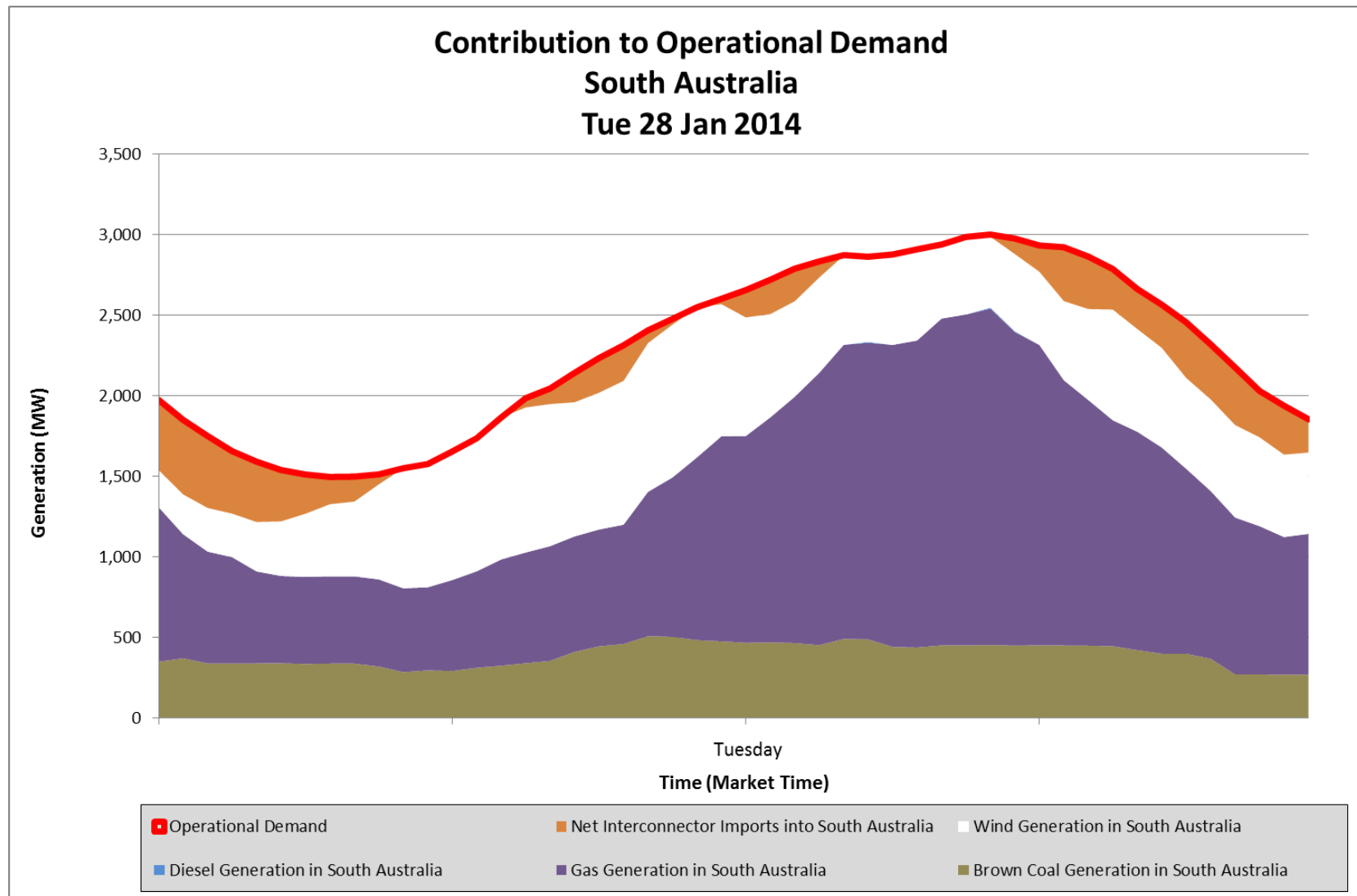


Figure B2

6 Appendix C

DFS Forecasting Performance

Figure C1 indicates DFS performance for Tuesday 28 January 2014 in Victoria.

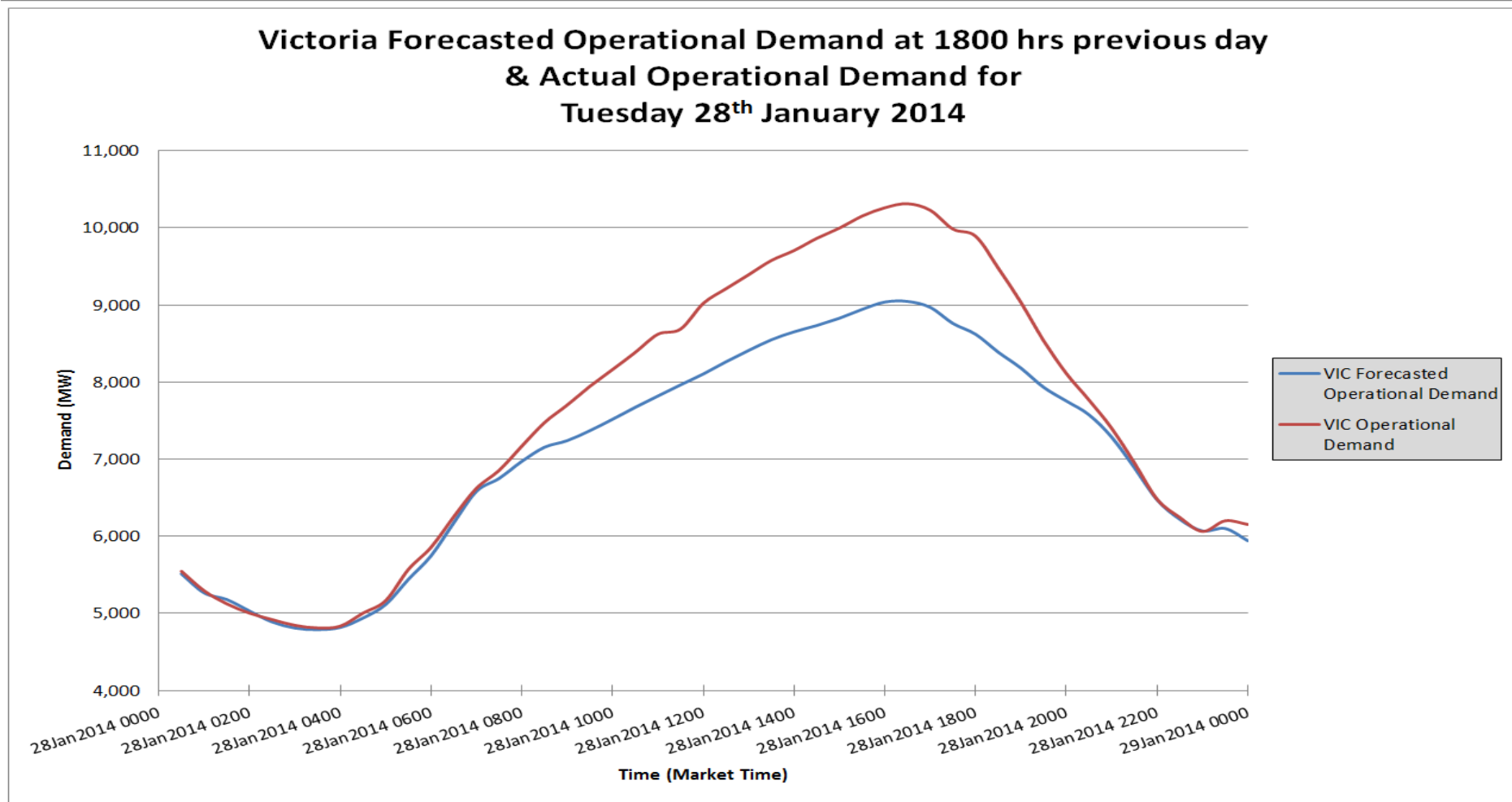


Figure C1

Figure C2 indicates DFS performance for Tuesday 28 January 2014 in South Australia.

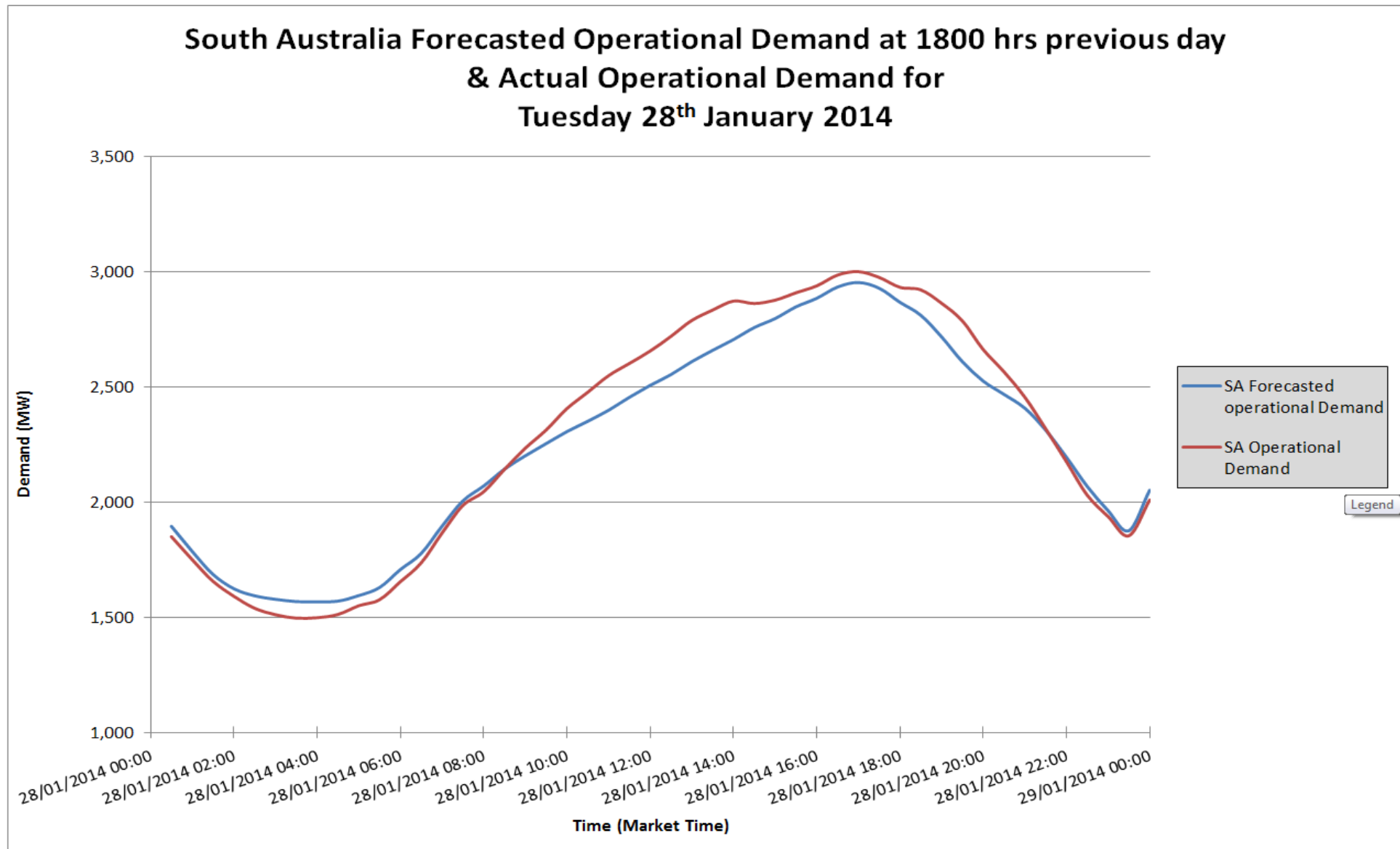


Figure C2

7 Appendix D

Key Events

| South Australia | | | |
|-------------------------------|------------------|-------------|--|
| Asset/Event | Duration | Cause | Potential/Actual Impact |
| Lack of Reserve (LOR) Level 1 | 28 Jan 1600-1630 | High Demand | Load shedding potentially required if large generator or high capacity interconnector was to become unavailable. |

8 Glossary

| | |
|-----------------------------|---|
| Demand | See note below. |
| DFS | Demand Forecasting System |
| Forecast Operational Demand | Published by AEMO's Demand Forecasting System (DFS) at 18:00 hours the day before (for example, for 28 Jan 2014 this was published by DFS on 27 Jan 2014 at 18:00 hours). |
| LOR | Lack Of Reserve |
| Market Time | All data is recorded at National Electricity Market Time (GMT +10:00 hrs) |
| MW | Megawatt |
| MWh | Megawatt hours |
| \$/MWh | Dollars per Megawatt hour |
| Operational Demand | Demand met by Scheduled+Semi-Scheduled+Non-Scheduled Wind Generations (aggregate capacity \geq 30 MW). |

Note: A definition of types of demand is provided on AEMO's website in the Regional Demand Definition document (link: <http://www.aemo.com.au/Electricity/Market-Operations/Dispatch/Regional-Demand-Definition>).