

**DETERMINATION OF THE MARKET SURVEILLANCE AND COMPLIANCE PANEL
MSCP/2012/D1**

Market Surveillance and Compliance Panel (“MSCP”)

Mr Thean Lip Ping, Chair
Professor Lim Chin
Mr Lee Keh Sai
Mr TPB Menon
Mr Philip Chua

Date of Determination

15 May 2012

Party

Energy Market Company Pte Ltd (“EMC”)

Subject

Failure to determine, release and publish the real-time dispatch schedules for period 30 on 2 December 2011.

Applicable Rule(s) in the Singapore Electricity Market Rules

1. Section 9.2.1 of Chapter 6

“The EMC shall, prior to the commencement of each dispatch period and in accordance with the market operations timetable, use the market clearing engine to determine for that dispatch period:

9.2.1.1 a real-time dispatch schedule, containing schedules of energy, reserve and regulation for registered facilities, to be released to the PSO, which in accordance with Section 9.1.2 of Chapter 5 shall be deemed to constitute the dispatch instructions issued by the PSO to the applicable dispatch coordinators unless and until further dispatch instructions are issued by the PSO to a given dispatch coordinator pursuant to section 9.1.3 of Chapter 5; and

9.2.1.2 a real-time pricing schedule determined by the market clearing engine... including:
a. energy prices for each network node;
b. the uniform Singapore electricity price;
c. reserve prices for each reserve class and for each reserve provider group; and
d. regulation prices.”

The market operations timetable in Appendix 6A of Chapter 6 provides for EMC to commence computing the real-time dispatch schedule using the market clearing engine 5 minutes before the beginning of each dispatch period.

2. Section 9.2.3 of Chapter 6

“The EMC shall, in accordance with the market operations timetable, release to the dispatch coordinator for each registered facility a real-time dispatch schedule comprising that portion of the real-time dispatch schedule referred to in section 9.2.1.1 that describes the quantities of energy, reserve by reserve class and regulation scheduled in respect of that registered facility.”

3. Section 9.2.4 of Chapter 6

“The EMC shall, in accordance with the market operations timetable, publish the following information as it pertains to each dispatch period:

- 9.2.4.1 total load;
- 9.2.4.2 total transmission losses;
- 9.2.4.3 total reserve requirements by reserve class;
- 9.2.4.4 total regulation requirements;
- 9.2.4.5 energy prices associated with each market network node at which a generation registered facility or generation settlement facility is located, determined in accordance with sections D.24.1 and D.24.5 of Appendix 6D;
- 9.2.4.6 the uniform Singapore energy price, determined in accordance with section D.24.6 of Appendix 6D;
- 9.2.4.7 reserve prices for each reserve class and reserve provider group, determined in accordance with sections D.24.3, D.24.5 and D.24.7 of Appendix 6D;
- 9.2.4.8 regulation prices, determined in accordance with sections D.24.4 and D.24.5 of Appendix 6D;
- 9.2.4.9 any system energy shortfalls reported by the market clearing engine;
- 9.2.4.10 any system reserve shortfalls, by reserve class, reported by the market clearing engine;
- 9.2.4.11 any system regulation shortfalls reported by the market clearing engine; and
- 9.2.4.12 a list of security constraints and generation fixing constraints applied.”

The market operations timetable in Appendix 6A of Chapter 6 provides for EMC to release and publish the above market information 30 seconds before the beginning of each dispatch period.

Facts and Circumstances

- 4. On 2 December 2011 at 2:06pm, EMC’s IT on-call personnel (“on-call”) received the system alert to check the National Electricity Market of Singapore (“NEMS”) database (“Database”). The on-call responded immediately but could not log in to the Database. Access to the UNIX database server which hosts the Database was also very slow and the system was reporting errors relating to the UNIX processes.
- 5. EMC said that the UNIX host was unable to create new processes to handle system tasks including new requests for the Database. However, the existing processes within the Database were unaffected and were being completed normally.
- 6. When the UNIX Database server reboot was re-started at 2:09pm, the restart was extremely slow. The UNIX Database Server and the NEMS systems were only normalized from 2:38pm onwards.
- 7. This had resulted in the lateness in sending the real-time schedules for period 30 on 2 December 2011 to the PSO and the dispatch coordinators.

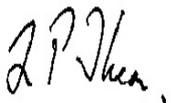
8. EMC escalated the issue to Oracle technical support for UNIX and Oracle Database on 2 December 2011. BMC Patrol, which provides the software for system health monitoring, was also contacted on possible issues regarding monitoring related tools.

Oracle and BMC Patrol support teams were unable to identify the root cause of the problem.

9. On 6 December 2011, EMC attempted to replicate the incident using dispatch run facility systems but to no avail. To date, the root cause of the problem remains unknown.
10. EMC has taken remedial actions to prevent the recurrence of the problem.
11. On 2 December 2011, EMC IT team reviewed the BMC Patrol monitoring parameters to ensure all necessary patrol monitoring measures were in place to monitor the UNIX Database server.
12. On 6 December 2011, Oracle and BMC Patrol implemented a new procedure to capture memory status parameters to identify the potential root cause of the problem, should the same problem reoccur.
13. On 16 December 2011, EMC IT team planned to introduce additional system monitoring tools to monitor lightweight processes within the master process so that any abnormal increase in processes will trigger an alert to on-call and system administrators. The script for monitoring lightweight processes was rolled out to the production system on 8 March 2012.

Determination

14. On 5 March 2012, the MSCP issued a letter informing EMC that it considered that EMC had prima facie breached sections 9.2.1, 9.2.3 and 9.2.4 of Chapter 6 of the Singapore Electricity Market Rules (the "market rules") and invited EMC to make written representations. EMC replied on 15 March 2012 that it would not be making written representations.
15. The MSCP determined on the basis of the facts referred to above that EMC breached sections 9.2.1, 9.2.3 and 9.2.4 of Chapter 6 of the market rules.
16. However, the breach was self-reported and without significant impact on the wholesale electricity markets.
17. Therefore, the MSCP determined that the appropriate action to be taken was to issue a letter of non-compliance to EMC and to direct EMC to pay costs, fixed at \$1,300.



Thean Lip Ping
Chair
Market Surveillance and Compliance Panel