

**DETERMINATION OF THE MARKET SURVEILLANCE AND COMPLIANCE PANEL  
MSCP/2006/D7**

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**Market Surveillance and Compliance Panel (“MSCP”)**

Mr Joseph Grimberg, Chair  
Professor Lim Chin  
Mr Lee Keh Sai  
Mr TPB Menon  
Mr David Wong

**Date of Determination**

3 May 2006

**Party**

Energy Market Company Pte Ltd (“EMC”)

**Subject**

Failure to determine, release, and publish information on 8 April 2005 for

- a. Real-time schedules for periods 21, 22 and 23;
- b. Short-term schedules for periods 22, 23, 24; and
- c. Pre-dispatch schedule for period 25

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**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 market 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 the EMC to begin computing a real-time dispatch schedule using the market clearing engine 5 minutes prior to the beginning of the dispatch period.

The market operations timetable in Appendix 6A of Chapter 6 provides for the EMC to release the real-time dispatch schedule to the PSO prior to 30 seconds before the beginning of the 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.”

The market operations timetable under Appendix 6A of Chapter 6 provides for the EMC to release the real-time dispatch schedule and real-time pricing schedule prior to 30 seconds before the beginning of the dispatch period.

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...;
- 9.2.4.6 the uniform Singapore energy price...;
- 9.2.4.7 reserve prices for each reserve class and reserve provider group...;
- 9.2.4.8 regulation prices...;
- 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 that the EMC must publish the market information set out in section 9.2.4 of Chapter 6 prior to 30 seconds before the beginning of the dispatch period.

4. Section 7.4.1 of Chapter 6

“The EMC shall, in accordance with section 7.6 and Appendix 6A, determine three pre-dispatch schedule scenarios corresponding to the nodal load forecast described in section 7.2.1 adjusted where applicable under section 7.2.3.”

5. Section 7.4A.1 of Chapter 6

“The EMC shall, in accordance with section 7.6 and Appendix 6A, determine a short-term schedule corresponding to the nodal load forecast described in section 7.2.1.1.”

According to the market operations timetable, the EMC is required to commence computing the short-term schedule 4 minutes prior to the beginning of the dispatch period.

6. Section 7.7.2 of Chapter 6

“Not later than 15 minutes prior to the commencement of the first dispatch period of each of the three pre-dispatch schedule scenarios referred to in section 7.4.1, the EMC shall, for each dispatch period included in each of those three pre-dispatch schedule scenarios:

7.7.2.1 release to the dispatch coordinator for each registered facility the projected schedules for energy, regulation and reserve, by reserve class, for that registered facility;

7.7.2.2 publish the information described in section 7.7.3; and

7.7.2.3 communicate to the PSO the projected schedules for energy, regulation and reserve, by reserve class, for each registered facility, together with the information described in section 7.7.3, in accordance with the system operation manual and any applicable market manual.”

7. Section 7.7.2A of Chapter 6

“Not later than 25 minutes prior to the commencement of the first dispatch period of the short-term schedule referred to in section 7.4A, the EMC shall, for each dispatch period included in the short-term schedule:

7.7.2A.1 release to the dispatch coordinator for each registered facility the projected schedules for energy, regulation and reserve, by reserve class, for that registered facility;

7.7.2A.2 publish the information described in section 7.7.3; and

7.7.2A.3 communicate to the PSO the projected schedules for energy, regulation and reserve, by reserve class, for each registered facility, together with the information described in section 7.7.3, in accordance with the system operation manual and any applicable market manual.”

8. Section 7.7.3 of Chapter 6

“In accordance with sections 7.7.1, 7.7.2 and 7.7.2A, the EMC shall publish the following information for each dispatch period and for each market outlook scenario, pre-dispatch schedule scenario and short-term schedule:

- 7.7.3.1 the projected total load;
- 7.7.3.2 the projected transmission losses;
- 7.7.3.3 total reserve requirements by reserve class;
- 7.7.3.4 total regulation requirements;
- 7.7.3.5 projected energy prices associated with each market network node at which a generation registered facility or generation settlement facility is located....;
- 7.7.3.6 the projected uniform Singapore energy price....;
- 7.7.3.7 projected reserve prices for each reserve class and reserve provider group....;
- 7.7.3.8 projected regulation prices....;
- 7.7.3.9 any predicted system energy shortfalls;
- 7.7.3.10 any predicted system reserve shortfalls, by reserve class;
- 7.7.3.11 any predicted system regulation shortfalls; and
- 7.7.3.12 a list of security constraints and generation fixing constraints applied.”

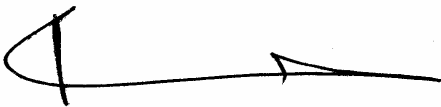
**Facts and Circumstances**

- 9. According to EMC, it failed to determine and release the following on 8 April 2005:
  - a. Real-time schedules for periods 21, 22 and 23;
  - b. Short-term schedules for periods 22, 23 and 24; and
  - c. Pre-dispatch schedule for period 25,and to publish information within the deadlines required in the market rules.
- 10. EMC reported that there is ongoing real-time data replication (using DRM and DataGuard methods) from its IT system Production database to its Disaster Recovery (DR) database via the Fibre Channel Internet Protocol (FCIP) link.
- 11. On 7 April 2005, EMC carried out a planned power shutdown at its DR site for some electrical works. Therefore the data replication for 7 April 2005 was halted. On 8 April 2005, at about 9:40 am, EMC re-established the FCIP link between the production and DR sites to enable DRM and DataGuard synchronization.
- 12. At that time, the market clearing engine (MCE) at its production site was processing the real-time schedule for period 21, short-term schedule for period 22 and pre-dispatch schedules (3 scenarios) for period 25. It was noted that MCE processing slowed down resulting in the real-time schedule for period 21 and 22, short-term schedules for periods 22 and 23 not being completed within the time required under the market rules ie the schedules were not determined and information not published in time. EMC then aborted the processing of the pre-dispatch schedules for period 25 to free up the computer resources for the MCE.
- 13. EMC decided to re-start all application services. However, there were problems when shutting down and re-starting the Oracle Database. This resulted in the failure to determine and release the real-time schedule for period 23 and short-term schedule for period 24.
- 14. EMC then rebooted the cluster servers to re-initialize the IT system and release all resources. The Oracle database was re-started and the IT system resumed its operation successfully. At the same time, the DRM replication was completed.

15. Investigation by EMC revealed that the root cause was the failure of the SAN (storage area network) controller cache battery at the DR site and the subsequent controller resets which impacted the performance of the IT system at the DR site. This affected the performance of the DRM and DataGuard replication from the production site to the DR site, which in turn also affected the performance of the IT system at the production site.
16. Additionally, the simultaneous re-activation of DRM and DataGuard replication of 7 April 2005 data further decreased the system performance.
17. Both the events described in paragraphs 15 and 16 resulted in the slowdown of the MCE processing and subsequent missing schedules.
18. On 11 April 2005, EMC replaced the faulty SAN controller cache battery.
19. This incident did not have a significant impact on the wholesale electricity markets.

### **Determinations**

20. On 8 July 2005, the MSCP issued a letter informing the EMC that it considered that the EMC had prima facie breached sections 9.2.1, 9.2.3, 9.2.4, 7.4A.1, 7.7.2A, 7.4.1 and 7.7.2 of Chapter 6 of the Singapore Electricity Market Rules (the 'market rules') and invited EMC to make written representations. No written representations were received by the deadline stipulated.
21. The MSCP determined on the basis of the facts referred to above that the EMC breached sections 9.2.1, 9.2.3, 9.2.4, 7.4A.1, 7.7.2A, 7.4.1 and 7.7.2 of Chapter 6 of the market rules.
22. However, the breach was self-reported, rectified quickly and without significant impact on the wholesale electricity markets.
23. Therefore, the MSCP determined that the appropriate action to be taken was to issue a letter of non-compliance to the EMC and to direct the EMC to pay costs, fixed at \$1,000.



Joseph Grimberg  
Chair  
Market Surveillance and Compliance Panel