DETERMINATION OF THE MARKET SURVEILLANCE AND COMPLIANCE PANEL
MSCP/2006/D5

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 12 March 2005 for
a. Real-time schedules for periods 12, 14, 16,17,18,19 and 20;
b. Short-term schedules for periods 13, 15,17,18,19 20 and 21; and
c. Pre-dispatch schedule for period 21.

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 the EMC, it failed to determine and release the following on 12 March 2005:
   a. Real-time schedules for periods 12, 14, 16,17,18,19 and 20;
   b. Short-term schedules for periods 13, 15,17,18,19, 20 and 21; and
   c. Pre-dispatch schedule for period 21,
   and to publish information within the deadlines required in the market rules.

10. The incident started with the real-time schedule for period 12 and short-term schedule for period 13 not being determined and released on time because the Auto-Approval process in the IT system was not able to authorize the schedules on time due to the Weblogic application (an application in the IT system required to automate approval of the schedule) not responding.

11. The real-time schedule for period 13 and short-term schedule for period 14 were determined on time. However, this was done manually as the Auto-Approval process had not responded.

12. The real-time schedule for period 14 and short-term schedule for period 15 were not determined on time because the market clearing engines were found not to be connected to the database and needed to be re-started.

13. The real-time schedule for period 15 and short-term schedule for period 16 were determined on time. However, this was again done manually as the Auto-Approval process continued to fail to respond.

14. At this point, EMC decided to re-start all the application services and the Oracle database. During the re-start process, the production servers and the Oracle database hung. This resulted in the failure to determine and release the real-time schedule for periods 16,17,18,19 and 20, short-term schedule for periods 17, 18, 19 20 and 21 and pre-dispatch schedule for period 21 and to publish the required information.

15. Due to its inability to re-start the production servers, EMC switched over its IT operation to its Disaster Recovery Site from 9:15am onwards and the subsequent schedules were successfully determined from the Disaster Recovery Site.

16. In the meantime, EMC together with its vendors, Hewlett Packard and Oracle, reviewed all servers and application logs at its production site and found no definite error. Subsequently EMC successfully rebooted all its production servers, restarted all applications and refreshed all services in its IT systems at the production site without difficulty.

17. EMC switched its IT operation back to its production site on 16 March 2005.

18. In summary, the incident was first caused by the failure of the connectivity interfaces between the various IT application components. When EMC tried to carry out a shutdown and restart for the application services and database so as to refresh the connectivity, the server failed to re-start resulting in the missing schedules. The EMC attributed this to the low memory resource of the system due to the built up of a large amount of market data in the IT system. The consensus of EMC and its vendors on the incident was that the applications failed because they had been continuously running for some months without re-starting the system. EMC has since confirmed that the root cause of the incident was the low free memory and heavy swapping in its IT system after 3 months of continuous usage since the last re-start.

19. Going forward, EMC will be implementing a regular monthly maintenance programme that will include restarting all applications and servers to mitigate the risk of the IT system hanging. EMC will also be engaging its application and server vendors to perform a health check on the configuration and parameter settings of the IT system to ensure that it is operating on the available system resources effectively. EMC will also increase its IT system memory to 6GB to 12GB.

20. This incident did not have a significant impact on the wholesale electricity markets.

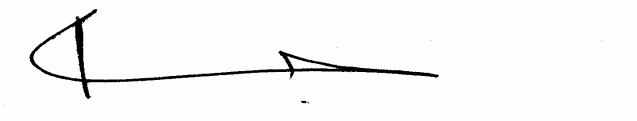
Determinations

21. 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.

22. 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.

23. However, the breach was self-reported and without significant impact on the wholesale electricity markets.

24. 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.



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Chair
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