

**DETERMINATION OF THE MARKET SURVEILLANCE AND COMPLIANCE PANEL
MSCP/2010/D2**

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

10 March 2010

Party

Energy Market Company Pte Ltd (“EMC”)

Subject

Failure to determine, release and publish information on 18 December 2009 for

- a. Real-time dispatch schedule for period 26; and
 - b. Short-term dispatch schedule for period 27
-

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 7.4A.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.

5. 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.”

6. 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

7. According to EMC, it was notified on 18 December 2009 by its internal NEMS monitoring system that the real time dispatch schedule (RTS) for period 26 and short-term schedule (STS) for period 27 had not been completed in the NEMS systems.

8. Upon urgent investigation, EMC found that the NEMS database resources were fully utilized and stalled, preventing the RTS and STS from being completed.

9. Further analysis revealed that EMC had performed maintenance activity during the off-peak zone of 12:06pm to 12:19pm on 18 December 2009.

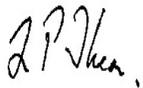
10. The maintenance activity was to clear un-used history partitions, to reclaim space from database, and to improve performance of the back end jobs which gather statistics daily for all database objects. Since the start of the market, EMC has been using the window period between two dispatch runs to perform similar system changes and maintenance activities which can be finished before the next dispatch run starts. This is to ensure that there would

be minimal impact on the market and system disruptions are minimized for Market Participants ("MP").

11. EMC also said that this maintenance activity was previously performed without issue in the production systems in November 2008.
12. In addition, EMC had tested the maintenance activity in the test environment successfully, prior to the commencement of the said maintenance activity on 18 December 2009.
13. EMC further said that its investigation also revealed that an MP had scheduled continuous download of historical data reports from NEMS production system at 1 second intervals.
14. This intensive downloading activity by the MP, together with EMC's maintenance activity caused a performance bottleneck and stalling of the Oracle database where resources were fully utilized, preventing any other access to the database.
15. To rectify the problem, EMC re-started the database and application interfaces to clear all sessions from the database to normalize the NEMS Systems.
16. The NEMS Systems resumed operations at 12:43pm.
17. EMC said that it took the following actions after the incident:
 - a. EMC will perform the drop partition and relevant structural changes to the NEMS system only during NEMS downtime when EMC carries out planned monthly maintenance of NEMS to address the identified risk of excessive re-compilation.
 - b. EMC's contractor, Oracle, also recommended an upgrade of the Oracle database to a higher version which has finer granularity to manage dependency of internal Oracle objects. EMC has accepted Oracle's recommendation. However, due to the high impact of the Oracle database upgrade, EMC has scheduled to upgrade the NEMS Oracle database only in 2011 when EMC carries out the NEMS server replacement project.
 - c. EMC has also advised the MP concerned of the issue. The MP concerned then took urgent action to reduce the number of downloads from 1-second to 3-minute intervals.
 - d. EMC will continue to advise MPs to access the NEMS systems and databases in a reasonable manner so as not to cause performance issues. EMC will advise all MPs during the Market System User Group (MSUG) meeting in February 2010 to inform EMC in advance of any massive data downloads. That would allow EMC to reschedule maintenance activities to avoid similar issues in future.
 - e. EMC is also considering limiting the volume of database resources that any MP can tie up at any time.
18. For the purpose of dispatch, the PSO, in the absence of the real-time dispatch schedule, used the relevant short-term schedule in accordance with the system operation manual. Price was determined by EMC re-running the market clearing engine in accordance with the market rules.
19. On 10 February 2010, the MSCP issued a letter informing EMC that it considered that EMC had prima facie breached sections 9.2.1, 9.2.3, 9.2.4, 7.4A.1 and 7.7.2A of Chapter 6 of

the Singapore Electricity Market Rules (the “market rules”) and invited EMC to make written representations. EMC replied that it would not be making written representations.

20. The MSCP determined on the basis of the facts referred to above that EMC breached sections 9.2.1, 9.2.3, 9.2.4, 7.4A.1 and 7.7.2A of Chapter 6 of the market rules.
21. However, the breach was self-reported, rectified quickly and without significant impact on the wholesale electricity markets.
22. 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