MINUTES OF THE RULES CHANGE PANEL
70th MEETING
HELD ON THURSDAY, 7 NOVEMBER 2013 AT 9.40AM
AT ENERGY MARKET CO. PTE LTD
238A THOMSON ROAD #11-01
NOVENA SQUARE, SINGAPORE 307684

Present: Dave Carlson  Toh Seong Wah
         Chan Hung Kwan  Michael Wong
         Sean Chan      Daniel Lee
         Luke Peacocke  Dallon Kay
         Dr. Toh Mun Heng  Phillip Tan
         Pak-Juan Koe   Frances Chang

Absent with apologies: Loh Chin Seng  Lawrence Lee
          Kng Meng Hwee

In Attendance: Paul Poh   Tan Liang Ching
               (EMC)    Lucia Loh     Serena Ho
               Wang Jing   Jo Ong

1.0  Notice of Meeting

The Chairman called the meeting to order at 9.40am. The Notice and Agenda of the meeting were taken as read.

2.0  Replacement of Consumer Representative on the Rules Change Panel (RCP)

The RCP was informed that the EMC Board, at their 2 October 2013 meeting, approved the appointment of Ms. Frances Chang Yoke Ping, Property and Projects Director of Dairy Farm Singapore to the RCP, with effect from 7 October 2013 to 31 December 2014.

The Chairman welcomed Ms. Frances Chang to the 70th RCP Meeting.

3.0  Confirmation of Minutes of the 69th RCP Meeting

The Minutes of the 69th RCP meeting held on 10 September 2013 was tabled.

Mr. Pak-Juan Koe requested EMC to correct a transposition error in the last paragraph on page 5.

Subject to the above amendment to the Minutes, the RCP approved the Minutes.
3.1 Matters Arising

3.1.1 Reshuffling of Priorities within Current Work Plan

Ms. Lucia Loh informed that the RCP requested for EMC to recommend a process to decide whether to include new issues into the work plan.

Ms. Loh noted that there are currently three avenues through which new issues can be included in the Rules Change Work Plan:

- Rules Change Work Plan prioritization exercise (Annual, March RCP meeting)
- Mid-year review of Work Plan (Annual, September RCP meeting)
- Rules Change request submission (Ad-hoc)

For new issues raised outside of the prioritization exercise, EMC recommends that the RCP consider the urgency and impact of the new issue to decide if it should replace an existing Work Plan issue where work has not commenced. EMC will make the assessment for the RCP's consideration.

Mr. Daniel Lee enquired whether there will be a deadline for the submission of new issues to be considered during the mid-year review so that the RCP could have sufficient notice prior to the September meeting. Mr. Paul Poh affirmed that there will be a deadline stipulated for the submission of urgent issues, to allow time for EMC to assess for the RCP’s consideration.

The RCP agreed with EMC’s proposed arrangement.
3.1.2 Rule Change Request Received

Ms. Loh informed the RCP that a Rule Change request has been submitted by the Association of Banks in Singapore (ABS) on 10 September 2013. The ABS proposed amending Clause 3 of the sample Bankers’ Guarantee (BG) in Appendix 2 of the current Market Administration Market Manual Part 1. The ABS is concerned with Clause 3 leaving the liability period of issuing banks open-ended, causing the issuing banks to be in breach of the ABS Bye-Laws.

Mr. Poh explained that BGs are one form of credit support in the SWEM, provided by MPs who are debtors to the market. Under the Market Rules, these MPs have to provide credit support amounting to 30 days of their estimated average daily exposure.

EMC assessed the urgency and impact of this issue to be medium; only one bank has ever raised this as an issue and in any case, this bank still proceeded to issue a BG using the sample format. EMC thus recommended that the RCP deal with this Rule Change request at the upcoming Rule Change Work Plan prioritization exercise.

Regarding Mr. Phillip Tan’s query on whether this issue should be dealt by lawyers instead, Mr. Poh replied that legal consultation will be sought when EMC works on this rule change.

The RCP agreed with EMC’s recommendation.

4.0 Summary of Outstanding Rule Changes

The RCP noted the summary of outstanding rule changes.
5.0 Monitoring List

Under Item 2 – Number of Market Clearing Engine (MCE) Re-runs

Mr. Paul Poh informed the RCP that from August to September 2013, there were 84 re-runs, all of which were related to grid congestion. Specifically, the re-runs could be categorized as follows:

- **Type 4**: These re-runs were required for periods where there were line violations in real-time schedules. When it was found ex-post that there was no physical load shed, EMC was required to conduct the re-runs.

- **Type 5**: These re-runs were necessary for cases where the prices were not reflecting their locational system marginal prices. During these periods, the PSO switched the connection point of a generator to a different bus bar, instead of the default bus bars in the standing data used by the MCE, to ease the congestion. Due to the mismatch between the physical and modelled connection point, the MNN price for this generator was not reflective of the locational system marginal price. After checking with the PSO on the actual bus bar used during those dispatch periods, EMC conducted the re-runs.

Mr. Michael Wong queried whether the re-runs were avoidable since the PSO decided on the change of bus bars used prior to the dispatch period and whether a lack of communication between the PSO and EMC was the reason why the necessary MCE input changes were not made to avoid the re-runs. Mr. Poh explained that the MCE is unable to model dynamic changes in the grid configurations real-time. Rather, standing data can only be updated once a day, restricting the model from keeping pace with real-time system changes.

In response to Mr. Luke Peacocke’s query on the party responsible for updating the bus bars in the MCE, Mr. Poh shared that the PSO is responsible for sending the updated data to EMC since only the PSO is aware of the network configuration, while EMC is responsible for uploading this updated data into the MCE.
Mr. Wong reiterated that the reason for monitoring the MCE re-runs is to find ways to minimize the number of re-runs. Since it is expected to have more of such cases in the future, we should look for ways to avoid it rather than relying on re-runs. If the PSO is able to inform EMC about the bus bar change, there should be a process for updating the MCE before the run and hence able to avoid any re-run under such scenario. Mr. Poh clarified that the change of the bus bars used were only known to EMC after the abnormal prices were observed and investigations were made.

**Proposed Dynamic Updating of Standing Data**

Mr. Pak-Juan Koe asked whether the issue was due to the congestion issue at Jurong Island and whether it will be an ongoing phenomenon. Mr. Peacocke proposed allowing the standing data to be updated more regularly to address this issue. Mr. Daniel Lee concurred and suggested that EMC can consider enhancing the system for standing data to be updated dynamically, akin to the load participation factor, which was previously also updated only once a day.

Mr. Toh Seong Wah responded that the current process of standing data update is through faxes from the PSO. The proposal would require an automated interface between the Energy Management System (EMS) of the PSO and the MCE of EMC, similar to that for the current network status update. Mr. Lee recognized that high costs may be incurred but reaffirmed that the system enhancement may be necessary. His rationale was that confidence in the MCE may be undermined due to the increasing frequency of re-runs. Mr. Toh agreed that EMC could conduct a feasibility study to estimate the cost for change.

The Chairman agreed that EMC will coordinate with the PSO to consider the proposed system enhancement for the dynamic updating of standing data and present it to the RCP at the next meeting.

### 6.0 Rule Change Work Plan Status Update

**Under Item 3 - Publication of total offer capacity for Reserve and Regulation in the Dispatch Run (DPR) and Publication of total offer capacity for Energy, Reserve and Regulation in the Look Ahead Run (LAR)**

Mr. Dallon Kay enquired about the Energy Market Authority’s (EMA) decision on the proposed rule changes and requested for a more definitive timeline. Mr. Paul Poh replied that the EMA is still reviewing this change, together with information disclosure for the futures market, and no timeline was provided.

The Chairman informed that he will seek the EMA's response on this issue.
Remodelling of Mixed Integer Program (MIP)-Based Regulation Constraints
(Paper No. EMC/RCP/2013/69/319)

Ms. Wang Jing presented the proposal to remodel MIP-based regulation constraints currently used in the MCE. She informed that the proposed rule changes were unanimously supported by the TWG at its 22nd meeting.

The MIP-based regulation constraints allow generation registered facilities (GRFs) to be scheduled for energy outside of their regulation range if they are not providing regulation. However, the current two-step optimization process in the MCE activates MIP-based regulation constraints only after generators are found to be trapped. Under certain circumstances, the MCE can consequently produce sub-optimal schedules. Thus, it is proposed to apply MIP-based regulation constraints in a one-step process for all dispatch periods. In addition, the MIP-based regulation constraints can be re-formulated using fewer variables and constraints to define the same solution space.

Mr. Kay queried whether a GRF scheduled at RegMin will be pulsed below its RegMin when providing scheduled regulation of 10MW down, for example. Ms. Wang clarified that when a generator is scheduled at RegMin for energy, it will be constrained by the regulation envelop and not be scheduled for any regulation. Mr. Poh added that the Automatic Generation Control (AGC) subsystem will only be able to control a generator when the generator’s output is within the regulation range bounded by RegMin and RegMax.

In response to Mr. Kay’s query on whether Solution C (as shown in Figure 3 of the paper) is always superior to Solution B in the cited example, Ms. Wang explained that this was just a suggested scenario, which could happen depending on various factors such as the offers submitted for the dispatch period. To Mr. Michael Wong’s question on why Solution A is not found, the Chairman explained that it is because the MIP-based regulation constraints are not activated in the first step.

Mr. Phillip Tan queried about the impact of the proposed change. Ms. Wang shared that over a one-month study period, the occurrences of sub-optimal solutions were rare i.e. 2 out of 30 x 48 periods. However, the net benefit values of these two sub-optimal periods increased significantly after the re-modelling, indicating that the new solutions found are more efficient.

Estimated Implementation Time and Costs

Ms. Wang shared that the total time required will be 26 calendar-weeks and the total additional cost required (on RCP budget) will be $49,700.
Mr. Tan expressed his concern about whether the increase in net benefit is worth the implementation costs of $49,700. The Chairman shared that with the total increase in net benefit of $15,678.14 over the one month studied, the implementation costs are expected to be recovered in a few months.

Mr. Wong questioned the rationale of the existing workflow, if a simple removal of such can result in better optimisation. Mr. Poh replied that the MIP-based regulation constraints were first introduced into the MCE in 2007 when MIP was relatively new and solvers were less efficient. The two-step process was thus adopted to avoid activating MIP all the time in consideration of the MCE’s solving time.

The RCP unanimously supported the proposed implementation of the remodelled MIP-based regulation constraints.

Mr. Kay asked if Item 11 on the Rules Change Work Plan (Regulation Provision by Storage Batteries) will be affected by this rule change since both issues involve regulation provision. Ms. Wang replied that this rule change applies only to regulation provision by generators. Mr. Poh added that storage batteries will not be subjected to the regulation range constraints. In response to the Chairman’s query about the progress of Item 11, Mr. Poh explained that it would most likely be presented at the March RCP meeting, pending the PSO’s response.

There being no other matters, the meeting ended at 10.40am.

David E. Carlson
Chairman

Minutes taken by:
Jo Ong
Economist, Market Administration