MINUTES OF THE RULES CHANGE PANEL

101st MEETING

HELD ON TUESDAY, 13 MARCH 2018 AT 10.00AM

AT ENERGY MARKET CO. PTE LTD

4 SHENTON WAY #03-01

SGX CENTRE 2, SINGAPOR E 068807

Present:  
Toh Seong Wah (Chairman)  
Daniel Lee  
Tan Jun Jie  
Sean Chan  
Fong Yeng Keong  
Carol Tan  
Matthew Yeo  

Vijay Sirse  
Henry Gan  
Ho Yin Shan  
Soh Yap Choon  
Dr. Toh Mun Heng  
Tan Chian Khong  

Absent with Apologies:  
Tony Tan

In Attendance:  
Wang Jing (EMC)  
Jo Ong  
Qin Wei Xiao  

Lucia Loh  
Yap Yun Ben

1. Notice of Meeting

The Chairman called the meeting to order at 10.05am. The Notice and Agenda of the meeting were taken as read.

2. Confirmation of Minutes of the 100th RCP Meeting

The Minutes of the 100th RCP meeting held on 16 January 2018 were noted and the RCP approved the Minutes.

3. Matters Arising from the 99th and 100th RCP Meetings

3.1 (a) Matters Arising from the 100th RCP Meeting - Validating Load Forecasts

At the 100th RCP meeting, the RCP would like EMC to check if the implementation costs would be lowered if the check is applied only for the VSTLF and not the STLF.

Ms Wang Jing informed the Panel that the implementation costs difference between validating only the VSTLF and validating both the VSTLF and the STLF is insignificant.
### 3.2 (b) Matters Arising from the 99th RCP Meeting - Publishing Additional Load Scenarios in the Forecast Schedules

At the 99th RCP Meeting, it was noted that the Panel was not ready to vote and would like EMC to rework the proposal based on Mr Luke Peacocke’s suggestion of optimising resources as well as Mr Dallon Kay’s proposal for lower MW value.

Ms Wang informed the Panel that EMC has studied the proposal and will present the results during this meeting.

### 4. Monitoring List

The RCP noted the contents of the Monitoring List.

### 5. Summary of Outstanding Rule Changes

The RCP noted the summary of outstanding rule changes.

### 6. Rules Change Work Plan Status Update

The RCP noted the update on the Rules Change Work Plan.

### 7. Publishing Additional Load Scenarios in the Forecast Schedules

(Paper No. EMC/RCP/101/2018/CP71)

#### 7.1

Mr Yap Yun Ben recapped the paper, previously presented at the 99th RCP meeting, which assessed 3 proposals on whether to (i) publish additional load scenarios in the short-term schedule (“STS”), (ii) review the granularity and number of load scenarios, and (iii) publish scenarios for different levels of reserve and regulation requirements.

#### 7.1.1

Dr Toh Mun Heng noted that there were comments received from 6 stakeholders in the first consultation and asked how many Market Participants (“MPs”) received the concept paper. Mr Y K Fong asked if the concept paper had been sent to all MPs. Ms Wang replied that the concept paper had been sent to all the MPs, totalling about 40 of them. She added that not all MPs will respond during consultation and those who respond are usually the commercial players.

#### 7.2

Mr Yap informed the Panel that at the 99th RCP meeting held on 14 November 2017, the Panel had requested that EMC to consider whether there are alternatives to implement the proposal to optimise resources such as:

1. to remove the high and low load scenarios published in MOS and use the existing hardware to solve for additional load scenarios for STS instead (hereafter referred to as “Alternative 1”); or
2. to solve the load scenarios sequentially instead of simultaneously (hereafter referred to as “Alternative 2”),

and to consider publishing load scenarios with higher granularity (i.e. 25MW or 50MW).
The Panel was briefed on the current workflow for Market Clearing Engine ("MCE") solving.

Mr Yap presented EMC’s analysis of Alternative 1, which entails removing the additional load scenarios from the PDS and/or MOS as these forecast schedules are produced further away from real time. He informed that EMC has explored the following 4 possible permutations:

- **Alternative 1A**: Remove 2 load scenarios from market outlook scenario ("MOS") (High & Low) and add 2 load scenarios into STS;
- **Alternative 1B**: Remove 2 load scenarios from MOS (High & Low) and add 4 load scenarios into STS;
- **Alternative 1C**: Remove 2 load scenarios from MOS (High & Low), remove 2 load scenarios from pre-dispatch ("PDS") (High & Low) and add 2 load scenarios into STS; and
- **Alternative 1D**: Remove 2 load scenarios from MOS (High & Low), remove 2 load scenarios from PDS (High & Low) and add 4 load scenarios into STS.

Generally, the removal of two additional load scenarios from MOS and PDS does not achieve the objective of lowering the implementation cost, unless only two load scenarios are added to the STS. In addition, the internal EMC manpower cost increases slightly (relative to the estimates in Table 8 of the paper) due to additional effort required to implement changes to remove the scenarios. The annual operation cost is not significantly lowered because the removal of load scenarios in the MOS does not free up hardware capacity given that the MOS is only run once a day.

It was noted that among the four alternatives, only Alternative 1C, which entails removing the two load scenarios in each of PDS and MOS, achieves the aim of lowering implementation costs.

Mr Yap then presented EMC’s analysis of Alternative 2 where EMC explored the sequentially solving approach and proposed that it be applied to load scenarios in the PDS and the MOS only, as (i) these forecast schedules are run less frequently than the STS, and (ii) the current rules provide relatively longer time for them to be produced. The STS was not considered as the current rules require the STS to be produced within 9 minutes.

Two options were explored:

- **Alternative 2A**: Sequential solving of both MOS and PDS and add 2 load scenarios into STS; and
- **Alternative 2B**: Sequential solving of both MOS and PDS and add 4 load scenarios into STS.

It was noted that Alternative 2A achieves the aim of lowering implementation costs. However, without purchasing additional hardware, EMC runs the risk of not meeting its market rules obligations to produce
the PDS and MOS using the sequential solving approach. Thus, the lower costs of implementing this alternative effectively transfers risk to EMC in fulfilling additional obligations (i.e. publishing additional 2 load scenarios in STS).

Mr Yap also highlighted the following concerns of EMC Market Operations:

- a fundamental change in the MCE design logic is required.
- EMC will be undertaking additional risks of failing to fulfill its obligations to publish the load scenarios for a given PDS or MOS in the event there are issues with a MCE solver.

EMC Market operations conveyed its view that the current market rules obligations on EMC to produce the PDS and MOS based on current Market Operations Timetable needs to be lifted if the proposed sequential solving approach is implemented.

Mr Yap then presented statistics of historical PDS and MOS solving time for the past 5 years, where the longest time taken for a PDS and MOS scenario is approximately 1337 and 6693 seconds respectively. This translates to a worst case scenario of 1 hour 7 mins and 5 hours 35 mins respectively if the three load scenarios were solved sequentially. Mr Yap informed the Panel that these are within the current allowable timeline of 2 hours and 7 hours respectively.

7.5.1 Mr Henry Gan said that the statistics on the solve times are based on normal scenarios where the MCE solves without any non-physical loss. In situations where there are a few iterations for every period in the forecast schedule, the solve time will increase and may exceed the estimated 1 hour 7 mins, and EMC will not be able to meet the market rules obligations. He cautioned that sequential solving, though can free up solver boxes, will increase the risk of not publishing the PDS and MOS in time, and such performance is measured by the regulator.

7.5.2 Mr Tan Jun Jie opined that the sequential solving seems like a more inefficient way of utilising the solver boxes. He added that to resolve the issue, one way would be to set a lower priority for the high and low load scenarios of the PDS and MPS than for the medium load scenario.

7.5.3 Mr Soh Yap Choon said that it is important that the PDS and MOS are published on time as they will be used for dispatch in cases where the RTS and STS are unavailable. To Mr Tan Jun Jie’s question on whether the PSO uses only the medium load scenario, Mr Soh replied in the affirmative.

7.5.4 Mr Soh asked whether the MCE solving is now more complicated with more interruptible loads and demand response bidding, for example, and questioned whether historical performance is able to predict future performance. Mr Henry Gan concurred and said that his view is that the complexity of the MCE has increased multiple folds.
7.6 With regards to Sembcorp Cogen’s comments during the second consultation stating that the “current scenarios in MOS and PDS are sufficient”, Mr Matthew Yeo clarified that it meant that Sembcorp Cogen values the additional load scenarios currently provided in the PDS and MOS.

7.7 **Additional Load Scenario for Forced Outage Scenario**

With reference to EMC’s recommendation to not publish an additional load scenario to simulate the impact of a forced outage, Mr Vijay Sirse commented that a simulation of the impact of forced outages on prices is important and requested EMC to explore the idea of publishing additional load scenario (to simulate forced outage).

7.7.1 Mr Matthew Yeo said that it will be a question of how much more the additional load scenario will cost.

7.7.2 Ms Wang Jing explained that at the 99th RCP meeting, EMC had recommended that the Panel not support the proposal to include an additional load scenario to simulate forced outages as only one MP had indicated support during consultation then.

7.7.3 Mr Tan Jun Jie sought clarification on how the forced outage size is proposed to be determined. Mr Yap said that, as stated in Page 9 of the paper, EMC proposed that the size be based on average scheduled energy level of Generation Registered Facilities in the preceding year.

7.7.4 Mr Tan Jun Jie said that the proposed high and low load scenarios are important for generators from the scheduling perspective. He asked Mr Sirse whether it is price information that is important, from Mr Sirse’s perspective as a retailer and demand response provider. Mr Sirse replied that any additional information would add to market transparency.

7.7.5 Mr Matthew Yeo opined that the same information could be inferred from the +100MW load scenario which is proposed to be published, since the average forced outage MW is quite low.

7.8 EMC recommends that the RCP:

(a) **support** publishing 2 additional load scenarios in the STS, and if so, **discuss and decide** whether to support Alternative 1C or Alternative 2A;
(b) **do not support** the proposal to publish scenarios for different levels of reserve and regulation requirement; and
(c) **task** EMC to draft the relevant rule modifications.
### 7.8.1 The Chairman first called for a vote on the decision to publish 2 additional load scenarios in the STS.

The following Panel members voted to **support** publishing 2 additional load scenarios in the STS:
- Mr. Daniel Lee (Representative of Retail Electricity Licensee)
- Mr. Vijay Sirse (Representative of Retail Electricity Licensee)
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Jun Jie (Representative of Generation Licensee)

The following Panel members voted **not to support** publishing 2 additional load scenarios in the STS:
- Mr. Soh Yap Choon (Representative of the PSO)
- Mr. Tan Chian Khong (Person experienced in Financial Matters in Singapore)
- Mr. Sean Chan (Representative of Retail Electricity Licensee)
- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)

The following Panel members **abstained** from voting:
- Ms. Ho Yin Shan (Representative of the market support services licensee)
- Mr. Henry Gan (Representative of EMC)
- Ms. Carol Tan (Representative of Transmission Licensee)

Hence, the Panel by **majority vote** supported publishing 2 additional load scenarios in the STS.

### 7.8.2 With regards to the decision to adopt Alternative 1C or Alternative 2A, the panel by **majority vote** supported **Alternative 1C**. The details of the voting outcome is as follows:

The following Panel members voted in support of **Alternative 1C**:
- Mr. Daniel Lee (Representative of Retail Electricity Licensee)
- Mr. Vijay Sirse (Representative of Retail Electricity Licensee)
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Jun Jie (Representative of Generation Licensee)
- Mr. Sean Chan (Representative of Retail Electricity Licensee)
- Mr. Soh Yap Choon (Representative of the PSO)

The following Panel members **abstained** from voting:
- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)
- Mr. Henry Gan (Representative of EMC)
- Ms. Carol Tan (Representative of Transmission Licensee)
7.8.3 The Panel also **by majority vote** do not support publishing scenarios for different reserve and regulation requirements.

The following Panel members voted **not to support** publishing scenarios for different reserve and regulation requirements.

- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)
- Mr. Henry Gan (Representative of EMC)
- Ms. Carol Tan (Representative of Transmission Licensee)
- Mr. Daniel Lee (Representative of Retail Electricity Licensee)
- Mr. Vijay Sirse (Representative of Retail Electricity Licensee)
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Jun Jie (Representative of Generation Licensee)
- Mr. Soh Yap Choon (Representative of the PSO)

The following Panel members **abstained** from voting:

- Mr. Tan Chian Khong (Person experienced in Financial Matters in Singapore)
- Ms. Ho Yin Shan (Representative of the market support services licensee)

7.9 With regards to the proposal to publish an additional load scenario to simulate the impact of forced outage, the Panel tasked EMC to check on the incremental costs of doing so and report back to the Panel.

(Paper No. EMC/RCP/101/2018/06)

Ms. Loh Lucia updated the Panel on the progress made in the previous work plan approved in March 2017. Out of the 13 issues scheduled to commence within the first 12 months, 5 issues have been completed and significant progress were made on 6 of the remaining issues.

She then briefed the Panel on the consultation process and ranking methodology adopted. She informed the Panel that EMC recommended that 12 issues (8 of which are in-progress) be shortlisted for commencement within the next 12 months.

The Panel considered and discussed the highest ranked issues on the list.
8.1 Issue 26 (Issuance of Gas System Stress Advisory)

Mr Soh Yap Choon referred to Issue 26 (Issuance of Gas System Stress Advisory), and opined that it should be referred to PowerGas, given that it pertains to gas system operations.

8.1.1 Chairman sought to understand why Issue 26 is ranked so highly (ranked #2 out of all issues where work has not started). Ms Loh referred the Panel to the comments received, where some participants felt that such information would be beneficial given that gas and electricity markets are closely linked.

8.1.2 Mr Daniel Lee suggested that it could be because the proposers or commenters do not have access to the GTSS.

8.1.3 The Panel by majority vote supported removing Issue 26, and referring the issue to the EMA.

The following Panel members supported **removing** Issue 26:
- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)
- Ms. Carol Tan (Representative of Transmission Licensee)
- Mr. Vijay Sirse (Representative of Retail Electricity Licensee)
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Jun Jie (Representative of Generation Licensee)
- Mr. Sean Chan (Representative of Retail Electricity Licensee)
- Mr. Soh Yap Choon (Representative of the PSO)
- Mr. Tan Chian Khong (Person experienced in Financial Matters in Singapore)
- Ms. Ho Yin Shan (Representative of the market support services licensee)

The following Panel members supported **retaining** Issue 26:
- Mr. Daniel Lee (Representative of Retail Electricity Licensee)

The following Panel members abstained from voting:
- Mr. Henry Gan (Representative of EMC)

8.2 Issue 7 (Load restoration command from PSO to be in sync with the periods for which loads offered to provide reserve)

Mr Vijay Sirse referred to Issue 7 and said that the market feedback received is that an open-ended period to remain shut down when activated for reserve poses as an impediment to participation. Mr Sirse added that there was an incident where the loads could not be restored for up to 4 hours.
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8.2.1 Mr Soh Yap Choon said that given that interruptible loads are activated only during system contingency events, the PSO cannot allow loads to restore until the PSO had ensured system stability.

8.2.2 Chairman said that given the differing views, it will be helpful for EMC to work on the proposal before bringing it to the Panel.

8.3 Issues not within RCP’s purview

During the consultation process with the stakeholders, it was noted that the following issues raised are not within RCP’s purview, as they do not pertain to the market rules. As such, EMC proposes that the following issues be removed from the RCP’s work plan and referred to EMA.

- Issue 28: Special support policy for green energy
- Issue 29: Impact of Carbon Tax and Carbon Credits on the existing Power Grid Supply and In-house Generation of Power using Trigen
- Issue 30: Clarify policy on gross meter PV export setup

8.3.1 The Panel by majority vote agreed to remove the 3 issues from the work plan and refer them to the EMA. The details are:

The following Panel members supported removing the three issues:
- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)
- Ms. Carol Tan (Representative of Transmission Licensee)
- Mr. Vijay Sirse (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Jun Jie (Representative of Generation Licensee)
- Mr. Daniel Lee (Representative of Retail Electricity Licensee)
- Mr. Henry Gan (Representative of EMC)
- Mr. Sean Chan (Representative of Retail Electricity Licensee)
- Mr. Soh Yap Choon (Representative of the PSO)
- Mr. Tan Chian Khong (Person experienced in Financial Matters in Singapore)
- Ms. Ho Yin Shan (Representative of the market support services licensee)

The following Panel member abstained from voting:
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)

8.4 Given the above decisions, the Panel unanimously agreed on the following Rules Change Work Plan for 2018/19 and tasked EMC to monitor its progress.
### Minutes of 101st RCP Meeting – 13 March 2018

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<th>Expected Commencement/Completion date</th>
<th>No.</th>
<th>Issue Title</th>
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<td>Within 12 months (by March 2019)</td>
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<td>Review of Automatic Financial Penalty Scheme (AFPS) &amp; related issues raised in the 2017 work plan prioritisation exercise</td>
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<td>Imposition of Minimum Net Tangible Asset as a Condition of Participation for Retailers</td>
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<td>Compensation for Load Registered Facilities with Restricted Energy Bids Arising from Price Revision</td>
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<td>Publishing Additional Load Scenarios in the Forecast Schedules</td>
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<td>Validating Load Forecasts</td>
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<td>Proposed Amendment to Sample Bankers’ Guarantee Format, Standby Letter of Credit (SBLC) Format</td>
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<td>Reduction of gate closure during forced outage events</td>
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<td>Publication of Offers</td>
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<td>Review Default Levy Arrangements</td>
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<td>Review of credit support requirements in alignment with the retailer of last resort framework</td>
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<td>27</td>
<td>To review the requirement for registration as commissioning generation facility for generation settlement facilities, except for intermittent generation facilities of aggregate name-plate rating 10MW or more</td>
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<td>07</td>
<td>Load restoration command from PSO to be in sync with the periods for which loads offered to provide reserve</td>
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<td>Within 13-24 months (i.e. by March 2020)</td>
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<td>Removal of the first-approach of Constraint Violation Penalties (CVP) rerun</td>
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<td>Invalid load ramping constraints in the Rules Modification for EMA’s “Implementing Demand Response in the National Electricity Market of Singapore”</td>
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<td>13</td>
<td>Review of the timeline for meter data investigation and adjustments after notice of dissent has been raised</td>
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<td>Review composition of the market surveillance and compliance panel (MSCP)</td>
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<td>34</td>
<td>Harmonisation of the AFP mechanism and Demand</td>
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9. **Date of Next Meeting**

The 102\textsuperscript{nd} RCP Meeting will be held on Thursday, 3 May 2018.

There being no other matters, the meeting ended at 11.30 a.m.

**Toh Seong Wah**  
Chairman

Minutes taken by:  
Angeline Tan  
Corporate Secretarial Executive