MINUTES OF THE RULES CHANGE PANEL
38TH MEETING
HELD ON TUESDAY 1 JULY 2008 AT 10.10AM
AT ENERGY MARKET CO. PTE LTD
238A THOMSON ROAD #11-01
NOVENA SQUARE, SINGAPORE 307684

Present: Dave Carlson (Chair) Henry Gan
Robin Langdale Tay Swee Lee
Dr. Kang Cheng Guan Philip Tan Pei Lip
Dr. Daniel Cheng Dr. Goh Bee Hua
Low Boon Tong Michael Lim
Dallon Kay Annie Tan
Lawrence Lee

Absent with Ng Meng Poh
Apologies:

In Attendance: Paul Poh Poa Tiong Siaw
(EMC) Tan Liang Ching Nerine Teo
Wang Jing Henry Wee

1.0 Notice of Meeting

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

2.0 Confirmation of Minutes of the 37th Rules Change Panel Meeting

The Minutes of the 37th Rules Change Panel meeting held on Tuesday, 13 May 2008 was tabled and taken as read.

There being no amendments to the Minutes, the Rules Change Panel unanimously accepted and approved the Minutes.

3.0 The Chairman took the opportunity to remind Panel members that from time to time, the RCP, in performing its duties, would receive confidential information. According to the Market Rules, the confidentiality provisions would also extend to EMC’s governance bodies such as the RCP, the MSCP and the DRCP.
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The Chairman asked the Panel members to keep information that was provided to the Panel but was not published as confidential and not to divulge such information.

4.0 Matters Arising

The Panel noted that the follow-up actions were completed on the matters arising as outlined.

On the issue of the concern that the Panel had regarding customers’ deposits in the event of a retailer’s default, a copy of EMA’s response dated 24 June 2008 was tabled for the Panel’s information. The EMA agreed to give further consideration to the matter as part of the EVS or other schemes for implementing full retail contestability.

5.0 Summary of Outstanding Rule Changes

The Panel noted the contents of the paper.

6.0 Monitoring List

The Panel noted the contents of the paper.

7.0 Appointment of Technical Working Group Member
(Paper No. EMC/RCP/38/2008/04)

The TWG consists of seven members from the following:

1. 4 experts based on nominations from market participants
2. 1 person nominated by the PSO
3. 1 MCE expert nominated by EMC
4. Chairperson nominated by EMC

The Panel was informed that EMC had proposed the appointment of Mr. Chen Jianhong to replace Mr. Lu Fei Yu as MCE Expert on the Technical Working Group. Mr. Lu has resigned from EMC.

EMC is of the view that Mr. Chen meets the necessary criteria and would be able to contribute effectively to the workings of the TWG. Thus, it recommended that the RCP appoint Mr. Chen Jianhong to the TWG, and that Mr. Chen’s term of appointment on the TWG be from 4 July 2008 to 20 January 2009.

The Panel approved the appointment of Mr. Chen Jianhong to the TWG for the period from 4 July 2008 to 20 January 2009.
8.0 **Changes Arising from the Review of Price Revision in the SWEM – Optimal Bidding under a Uniform Pricing Regime**  
(Paper No. EMC/RCP/38/2008/272)

At the 37th RCP Meeting, it was agreed that in the event of a downward price revision:

1. generators should be paid unmet costs and not forgone profits; and
2. generators offer based on marginal cost in a uniform pricing market.

There was some disagreement however on whether the marginal costs of offer stacks are dependent on infra marginal stacks (i.e. the total cost of producing offer stack 2 = revenue from clearing offer stack 2 + surplus from offer stack 1).

In his presentation, Mr. Tan Liang Ching quoted established economic literature which states that generators should bid approximately their marginal opportunity costs for energy in each of the blocks of power that they offer, with the marginal costs being the increment to total cost resulting from producing an additional output. This implies that offer stacks are independent of each other. He then illustrated quantitatively how generators deviating from this optimal strategy would fail to maximize profits in the long run.

Since generators bid at cost for each offer stack, and compensation should be based only on unmet cost, EMC reiterates its proposal to compensate generators only Loss\(_1\) (see figure below) when prices are revised downwards.

Mr. Philip Tan suggested that it may be more appropriate to replace the phrase “profit maximizing” with “cost recovery”. Mr. Dave Carlson added that the surpluses for generators are not exactly profits, as it is needed to cover fixed costs in the long run.
To Mr. Philip Tan’s query on whether EMC is still putting forward the recommendation to remove Type 4 reruns, Mr. Paul Poh updated the meeting that EMA is still deliberating on its earlier proposal on price separation. Mr. Dave Carlson reminded all that at the previous RCP meeting, he had suggested the Panel to reconsider Type 4 reruns even if the proposal on price separation is still pending, as Type 4 reruns is an inappropriate tool to solve the price separation issue.

Mr. Tay Swee Lee reiterated his concern that the contract between the generators and the market are based on the original contract price; therefore, generators should be compensated up to the original price level. Mr. Carlson reminded all that the current contract between the market and the generators is the market rules, which do not provide for any compensation.

Mr. Paul Poh commented that the key question is in the appropriate amount of compensation when price revision occurs. The reason why EMC proposes compensating based on “cost” rather than “cost + surplus” is because the counterparty is consumers/loads, which are equally innocent of the fault. The principle underpinning the compensation amount is to minimize compensation paid by the innocent party (consumers/loads), while ensuring that generators recover the cost for the out-of-merit production.

Mr. Kang stated that once prices have been cleared and generators have produced, they should be paid based on the original agreed price. He commented that from PSO’s perspective, price revision creates uncertainty in prices such that in future, if PSO calls upon generators to run, they may be uncertain of what they would be paid. Generators may thus be unwilling to run up their generator when requested by PSO during system emergencies.

Mr. Carlson suggested putting the following 2 issues to a vote:

1. **Whether or not to remove Type 4** – The panel had previously agreed in principle to remove Type 4 reruns. Arising from the price separation issue in Jan 08, Type 4 reruns removed some of the high prices, even though it is not an appropriate tool. The Panel said that they would like to await greater clarity on EMA’s decision on the rule change issue. Given that there is no certainty that EMA will go ahead with that rule change, does the Panel wish to see Type 4 remain or removed?

The following Panel members VOTED to support the removal of Type 4 reruns and redraft of the existing market rules for greater clarity:

Mr. Dallon Kay  
(representative of the wholesale electricity market trader class of market participant)  
Mr. Tay Swee Lee  
(representative of the Generation Licensee class of market participant)
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The following Panel members VOTED to redraft of the existing market rules for greater clarity but not support the removal of Type 4 reruns:

Mr. Philip Tan
(representative of the Generation Licensee class of market participant)
Mr. Low Boon Tong
(representative of the Generation Licensee class of market participant)
Ms. Annie Tan
(representative of the Retail Electricity Licensee class of market participant)

The following Panel members ABSTAINED:

Mr. Robin Langdale
(representative experienced in financial matters in Singapore)
Mr. Lawrence Lee
(representative of the Market Support Services Licensees class of market participant)

2. The compensation amount for generators adversely affected by price revision:

The following Panel members VOTED to provide Compensation (C) and pay generators just “Loss,” arising from price revision:

Mr. Robin Langdale
(representative experienced in financial matters in Singapore)
Mr. Michael Lim
(representative of the consumers of electricity in Singapore)
Mr. Henry Gan
(employee of the EMC not being the Chief Executive)
Mr. Lawrence Lee
(representative of the Market Support Services Licensees class of market participant)
Dr. Goh Bee Hua
(representative of the consumers of electricity in Singapore)
The following Panel members VOTED to provide Compensation (B) and pay generators “Loss,” and “Surplus,” arising from price revision:

Mr. Philip Tan  
(representative of the Generation Licensee class of market participant)  
Ms. Annie Tan  
Mr. Low Boon Tong  
(representative of the Generation Licensee class of market participant)  
Mr. Dallon Kay  
(representative of the wholesale electricity market trader class of market participant)  
Mr. Tay Swee Lee  
(representative of the Generation Licensee class of market participant)

The following Panel members ABSTAINED:

Dr. Daniel Cheng  
(representative of the transmission licensee class of market participant)  
Dr. Kang Cheng Guan  
(representative of the PSO)

Section 2.5.2 of Chapter 3, provides that at all meetings of the RCP, every question shall be decided by a majority of votes. Since there was no majority vote on this issue of compensation, no changes are proposed to the Market Rules to provide for compensation to affected generators when prices are revised.

Mr. Carlson summarized the results of the voting, which is that Type 4 reruns will be removed and, in absence of a clear majority, no compensation will be given to affected generators when prices are revised below the original price.

9.0 Submission Timeline for Bilateral Contract Data  
(Paper No. EMC/RCP/38/2008/277)

EMC presented the paper to provide clarity to the Market Rules on the timeline for submission of bilateral contract data.

The Panel was informed that, at present, the Market Rules provide that market participants (MPs) may submit bilateral contract data to EMC not earlier than 7 business days before and no later than 4 business days after the dispatch day. It is however not clear if submissions earlier than 7 business days can be made. The rules change proposal is to remove the ambiguity with regards to the submission by stating that bilateral contract data can be submitted to EMC any time before 4 business days after the relevant dispatch day.
The Panel supported EMC’s recommendation to amend Section 2.3.1 of Chapter 7 of the Market Rules and Section 2.1 of Chapter 2 of the Market Manual, Market Operations - Settlements and would make the necessary recommendation to the EMC Board for adoption.

{Mr. Philip Tan left the meeting}

10.0 Proposed Prudential Methodology using the Generalised Extreme Value (GEV) Distribution
   (Paper No. EMC/RCP/38/2008/278)

During the RCP work plan prioritisation exercise in January 2006, a market participant (MP) had requested for a review of prudential requirements for SWEM to be included in the work plan. That MP was concerned if the EMC currently holds sufficient credit support to safeguard against default payment, in light of a proposal to change the bearer of default risk from non-defaulting MPs to net creditors only.

The EMC Board had also raised a similar concern over the adequacy of the credit support currently held by the EMC, particularly in guarding against sustained price spikes.

EMC then engaged a consultant, Dr Ng Kah Hwa of NUS Centre for Financial Engineering, to conduct the review and propose a new prudential methodology for the Singapore Wholesale Electricity Market (SWEM).

The RCP, having considered the proposed prudential methodology in September 2006, agreed to EMC’s recommendations to test this new methodology in parallel with the existing prudential methodology. This trial ran from 10 September 2007 to 6 March 2008.

The RCP considered the results of the trial at the 37th RCP meeting on 13 May 2008 and, by majority vote, supported the implementation of the proposed prudential methodology.

The rule modifications under the implementation of this proposed prudential methodology were presented to the RCP at the 38th RCP meeting.
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The following Panel members VOTED for the proposed rule modifications:

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<tr>
<th>Name</th>
<th>Role Description</th>
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<tbody>
<tr>
<td>Mr. Robin Langdale</td>
<td>representative experienced in financial matters in Singapore</td>
</tr>
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<td>Mr. Henry Gan</td>
<td>employee of the EMC not being the Chief Executive</td>
</tr>
<tr>
<td>Dr. Goh Bee Hua</td>
<td>representative of the consumers of electricity in Singapore</td>
</tr>
<tr>
<td>Mr. Dallon Kay</td>
<td>representative of the wholesale electricity market trader class of market participant</td>
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The following Panel members DID NOT SUPPORT the proposed rule modifications:

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Mr. Tay Swee Lee</td>
<td>representative of the Generation Licensee class of market participant</td>
</tr>
<tr>
<td>Mr. Low Boon Tong</td>
<td>representative of the Generation Licensee class of market participant</td>
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The following Panel members ABSTAINED:

<table>
<thead>
<tr>
<th>Name</th>
<th>Role Description</th>
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<tbody>
<tr>
<td>Ms. Annie Tan</td>
<td>representative of the Retail Electricity Licensee class of market participant</td>
</tr>
<tr>
<td>Dr. Daniel Cheng</td>
<td>representative of the transmission licensee class of market participant</td>
</tr>
<tr>
<td>Dr. Kang Cheng Guan</td>
<td>representative of the PSO</td>
</tr>
<tr>
<td>Mr. Lawrence Lee</td>
<td>representative of the Market Support Services Licensees class of market participant</td>
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By majority vote, the Panel supported EMC’s recommendation and would make the necessary recommendation to the EMC Board for adoption.
11.0 **Publishing generation offers and dispatch quantities**  
(Paper No. EMC/RCP/38/2008/CP16)

The Panel was informed that generation facility-level offers and dispatch quantities for the Singapore Wholesale Electricity Market (SWEM) are currently not published. Given the SWEM's high level of market concentration, it was felt that the risks associated with implementing the proposal are more well-established and pertinent as compared to the potential benefits sought.

At the 35th RCP Meeting, the RCP asked EMC to consider what other types of information would be useful for release and what level of aggregation and delay would be appropriate.

EMC did an additional analysis on offer data for 6 periods for every Wednesdays in 2007. It was found that the shape of the offer curve did not vary significantly over 12 months. Therefore with a delay of up to 12 months, the strategic content in aggregate offer curves still exist.

EMC considered that the aggregate offer curve should not be published because under an environment where market power exists, this runs the risk of enabling generators that engage or intend to engage in capacity withholding to do it more effectively.

Dr. Kang Cheng Guan informed that when he first raised this issue, he suggested publishing offers as far back as possible so as to remove sensitivity. He felt that it would be appropriate to publish the data for transparency. The data would be useful for spotting behaviors such as withholding of capacity.

Mr. Poa informed that in a competitive setting, it would be appropriate and beneficial to publish even individual offer data. But in view of the concentrated generation market, the downside risks cannot be simply ignored. A competitive market is characterized by a high level of information availability. However, whether transparency leads to efficiency under all circumstances is not clear. With the presence of market power in the SWEM, EMC considered the downside risks of publishing offer information more considerable than the benefits.

Mr. Tay Swee Lee stated that at the previous meeting, he raised the issue on the HHI and was advised that HHI is not a criteria for determining the revelation of prices. He has now noted that HHI is used as a criteria.

In reply to Mr. Tay’s comment, Mr. Poa informed that the HHI is a measure used by the EMA in establishing the vesting contract regime. EMC did not use the HHI as a decision criterion to decide whether offer information should be published. The HHI is used in this study as an indicator of the level of supply-side concentration.
Mr. Dallon Kay indicated that it would be beneficial to release some dated information and suggested EMC to survey the market if there is any value in releasing such information.

EMC was asked to identify from the CRA’s July 2007 survey on other types of information that are commonly published in other electricity markets. It should also look at historical SWEM offer data from 2003 and observe if structural changes in the industry had changed offer patterns.

12.0 Review of Dispute Resolution Procedures (DRP)
(Paper No. EMC/RCP/38/2008/08)

The Panel was informed that in accordance with Section 3.15 of Chapter 3 in the Market Rules, the EMC Board will conduct a review of the DRP by 31 December 2008.

The review shall consider:
- Whether the procedures are fair and effective;
- Whether any additional procedures are necessary; and
- Any other matter that the EMC considers appropriate.

The proposed timeline of the review are as given:

**Timeline of Review**

<table>
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<tr>
<th>Date</th>
<th>Event</th>
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<tr>
<td>31 July 08</td>
<td>Paper to Board Meeting to initiate Review</td>
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<tr>
<td>Early Aug 08</td>
<td>Publish Notice of Terms of Reference and invite comments from MPs, MSSL and other interested parties</td>
</tr>
<tr>
<td>Sept – Oct 08</td>
<td>Review of DRP in collaboration with DRC, MAU and other MPs</td>
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<tr>
<td>Early Nov 08</td>
<td>Present Recommendations at Nov RCP for endorsement</td>
</tr>
<tr>
<td>Late Nov 08</td>
<td>Present Recommendations at Nov Board Meeting for endorsement</td>
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The Panel noted the contents of the paper.
13.0 **Update on RCP Work Plan**  
(Paper No. EMC/RCP/38/2008/09)

EMC updated the Panel on the progress on two issues on the RCP Work Plan. A concept paper on the two issues has also been published for consultation. Because of the complexity of the issues, EMC will be organizing a briefing on the concept paper to facilitate the industry’s understanding of the issues and for their subsequent submission of comments.

**Reserve Requirement to Meet The Largest Risk**

- **Existing Reserve Requirement Regime**

MCE schedule sufficient reserve to cover the largest risk of any **single** GRF

Risk of any GRF = Scheduled Energy of the GRF  
- Power System Response  
+ Scheduled Effective Reserve of the GRF  
+ (Risk of all SCU)

The PSO raised the following issues:

Currently, the reserve is sufficient to cover only the loss of any **single** GRF. However, the largest risk in the system could be higher than the risk of the largest online GRF under certain circumstances. Reserve might be insufficient to cover the largest risk in the system if that risk entails the tripping of multiple GRFs

Three new types of scenarios where tripping of multiple GRFs may occur were identified by the PSO as follows:

1. Two or more GRFs within the same Power Station that are codependent;
2. Only one transmission facility connects two or more GRFs within the same Power Station to the grid
3. Disruption of gas supply to two or more GRFs

**Type 1: Two or more GRFs are co-dependent**

During normal operation, if there is tripping of more than one GRF due to **single element/functional system failure**, the PSO will consider these GRFs to be co-dependent i.e. they could trip simultaneously/consecutively e.g. the logical units used to model 2-2-1 CCP.
Type 2: Multiple GRFs connected through one single Transmission Facility

Two or more GRFs within the same power station are connected to the grid through one remaining transmission facility. If this transmission facility trips, the system will lose all the GRFs connected through this transmission facility.

Type 3: Gas Disruption Risk

Description of issue:

When there is a disruption to gas supply, the system may lose multiple GRFs that are supplied from the same pipeline.

Gas Disruption Risk identified by PSO

For Gencos with two gas pipelines:

1. When the alternate gas pipeline is not available; and the diesel system or hot-switching capability is on maintenance
2. When the alternate gas pipeline is not available; and
3. the gas metering facility or receiving facility at the power station is on single stream operation (not enough time to switch)
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For Gencos with only one gas pipeline:

1. When the diesel system or hot-switching capability is on maintenance
2. When the gas metering facility or receiving facility at the power station is on single stream operation (not enough time to switch)

   - In any of these three scenarios, the system could lose more than one GRF
   - Reserve requirement set to cover loss of one (largest) GRF only
   - Insufficient reserve due to load shedding or partial blackout

Proposed Solution

Model these new risks into EMC’s system

Reserve requirement setting (MCE)

\[
\text{Risk} = \text{Sum of Scheduled Energy of all GRFs affected} - \text{Power System Response} + \text{Sum of Scheduled Effective Reserve of all GRFs affected} + \text{(Risk of all SCU)}
\]

Changes to reserve cost allocation in the settlement module would also need to be made.

Progress up-to-date

- Prototype MCE built
- Preliminary simulation done
- Studying the changes required for reserve cost allocation

Simulation Results

Limitation and Assumption:

- 1 case for each type of situation only
- Each case considering only two GRFs combined together. (Actual scenarios could have more than 2 GRFs, i.e. reserve requirement would be larger)
- Parallel run for one week
- No change in input such as unit offers, demand, system condition etc.

The simulation showed that, in some cases, the impact on cost of energy, reserve and regulation was very significant.
Mr. Tay Swee Lee and Ms. Annie Tan both noted that the gencos were named in the simulation report and were concerned that such sensitive data was released.

Mr. Paul Poh informed the Panel that EMC recognized such areas of sensitivity and will minimize the release of such sensitive information. In this case, when we discussed implementation aspects of the proposed regime, the RCP would need to consider whether releasing the identity of the GRFs grouped into multi unit contingency groups by PSO to the market when PSO triggers a Type of multi unit contingency event would be useful. Doing so could have the benefit of the market having advance notice of the additional amount of reserve required and the potential additional energy required from other GRFs. The market could then have time to react by offering additional capacity (in response to potentially higher prices) so that price increases can be moderated. This potential benefit would need to be considered against the sensitivity the gencos that are identified may have.

There being no other matters, the meeting ended at 12.40pm with a vote of thanks to the Chair.

Dave E Carlson
Chairman

Minutes taken by:
Eunice Koh
Senior Executive - Corporate Secretariat