MINUTES OF THE RULES CHANGE PANEL
98th MEETING
HELD ON TUESDAY, 12 SEPTEMBER 2017 AT 10.30AM
AT ENERGY MARKET CO. PTE LTD
4 SHENTON WAY #03-01
SGX CENTRE 2, SINGAPORE 068807

Present: Paul Poh (Chairman) Priscilla Chua
Daniel Lee Henry Gan
Luke Peacocke Lim Han Kwang
Sean Chan Marcus Tan
Lawrence Lee Soh Yap Choon
Grace Chiam Phillip Tan
Dr. Toh Mun Heng

Absent with Apologies: Dallon Kay

In Attendance: Toh Seong Wah (CEO) Wang Jing
(EMC) Lucia Loh Jo Ong
Yap Yun Ben Qin Wei Xiao

1. Notice of Meeting
The Chairman called the meeting to order at 10.30am. The Notice and Agenda of the meeting were taken as read.

2.1 Confirmation of Minutes of the 95th RCP Meeting
The Minutes of the 95th RCP meeting held on 18 July 2017 were noted and the RCP approved the Minutes.

2.2 Matters Arising from 95th RCP Meeting held on 18 July 2017
EMC and PSO Fees
At the 95th RCP meeting, Mr Luke Peacocke had requested for an update on the review of EMC and PSO’s fees methodology that was discussed during the 92nd RCP meeting once EMA has responded.

EMC noted Mr Peacocke’s request and will update the panel when EMA as responded.

2.3 Confirmation of Minutes of the 97th RCP Meeting
The Minutes of the 97th RCP meeting held on 17 August 2017 were noted and the RCP approved the Minutes.
3. **Monitoring List**

The RCP noted the contents of the Monitoring List.

3.1 The Chairman informed the Panel that EMC is calling for nominations for the next Rules Change Panel and reminded Panel members on the submission of nominations by the respective organisations.

4. **Summary of Outstanding Rule Changes**

The RCP noted the summary of outstanding rule changes.

5. **Rules Change Work Plan Status Update**

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

6. **Review of Sections 9.1.2.2 and 9.1.3 of Chapter 5 of the Market Rules**  
(Paper No. EMC/RCP/98/2017/345)

Mr Yap Yun Ben recapped the paper which reviews whether the Power System Operator (“PSO”) should issue dispatch instructions only to registered facilities with valid offers/bids under section 9.1.2.2 and 9.1.3 of Chapter 5 of the Market Rules.

6.1 Mr Yap summarised the two system conditions where PSO may issue dispatch instructions to registered facilities and the proposed solutions for the respective system conditions.

6.2 It was noted that the Panel had at the 95th RCP meeting, by majority vote supported EMC’s proposals to:

- replace the valid offer/bid requirements in section 9.1.2.2 of Chapter 5 of the Market Rules with the requirement to use the procedures specified in the SOM;
- remove the valid offer/bid requirements in section 9.1.3 of Chapter 5 of the market rules; and
- tasked EMC to draft the relevant rule modifications.

6.3 Mr Yap then presented a summary of proposed modifications to effect the RCP’s decisions as stated above.

6.4 Mr Yap informed the Panel that the proposed rule modifications were published on 4 August 2017 for consultation. Comments received from ExxonMobil Asia Pacific and the PSO were responded to.
EMC recommended that the Panel:
   a) support the proposed modifications to the market rules;
   b) recommend that the EMC Board adopt the proposed modifications; and
   c) recommend that the proposed rule modifications come into force 1 business day after the date on which the approval of the Authority is published by EMC.

The following Panel members voted in support of EMC’s recommendations are:
- Mr Henry Gan (Representative of the EMC)
- Mr Soh Yap Choon (Representative of the PSO)
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Mr Marcus Tan (Representatives of Generation Licensee)
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Phillip Tan (Person experienced in Financial Matters in Singapore)
- Ms Grace Chiam (Representatives of Generation Licensee)

The following Panel member abstained:
- Mr Lawrence Lee (Representative of the market support services licensee)

Compensation for Generators Adversely Affected by Price Revision (Paper No. EMC/RCP/98/2017/CP70)

Ms Lucia Loh presented the paper which assesses the proposal to compensate generators which are adversely affected by price revision.

Ms Loh gave a background on the rationale for having price revision despite the adoption of ex-ante pricing in the Singapore Wholesale Electricity Market ("SWEM"). She shared that there are 5 types of price revision conducted by EMC. While the original proposal suggested compensation for Type 2 price revision only, for comprehensiveness, the paper has examined compensation for all types of price revision except Type 3, where a compensation calculation methodology is already provided for in the market rules.

Ms Loh then presented EMC’s analysis of the proposal to compensate generators that are adversely affected by price revision.

EMC’s analysis illustrated that generators could indeed be adversely affected by price revision, if a generator’s revised market energy price
(MEP) is lower than the offer prices for quantities it was scheduled to generate. There is therefore a case for such generators to be compensated, so that they do not incur losses or out-of-pocket costs (relative to their offer prices) from following an erroneous ex-ante price signal. Hence, EMC’s proposed compensation methodology is based on affected generators’ offer stack.

7.3 On compensation procedures, Ms Loh said that the compensation claims currently allowed under the market rules are initiated and calculated either by MPs or the EMC. As part of consultation, EMC had sought MPs’ views on their preference, but noted that the estimated implementation costs and time for EMC-initiated compensation were not provided at the time of consultation.

7.3.1 Ms Loh added that if EMC were to initiate and calculate the compensation examined in this paper, EMC would need PSO to provide data on Generation Registered Facilities’ (GRFs’) AGC status and overriding dispatch instructions issued. The implementation cost estimates does not include the PSO’s costs.

7.3.1.1 Mr Soh Yap Choon said that a copy of PSO’s dispatch instruction is copied to the Market Assessment Unit and EMC, suggested EMC to check. Mr Henry Gan commented that EMC (Market Operations) has not seen a copy of PSO’s dispatch instructions before. On the costs for PSO to provide the AGC status data inputs to EMC, Mr Soh said that he does not expect it to be significant.

7.3.2 Mr Peacocke sought clarification on how MP-initiated compensation claim will work and what the system implications will be. Ms Loh explained that the MP-initiated claims will follow the current procedures set out in the market rules, where a MP will submit a compensation claim to EMC, and EMC will verify the calculations manually. If EMC is agreeable with the claim, the amount will be recovered via the monthly energy uplift charge (MEUC) and paid to the MP within 90 days.

7.4 It was noted that the total estimated additional costs incurred by EMC for EMC-initiated compensation, i.e. automatic calculation, is $245,000 if implementation commences from January 2019, and $405,000 if implementation commences upon approval of rules. Mr Gan explained that the difference of $160,000 is because EMC will be performing a server technology refresh and there will be a code freeze period from March 2018 to January 2019. The additional $160,000 would be incurred to merge the code if implementation were to begin immediately upon approval of the rules.

7.5 Proposed Compensation Methodology

The Chairman invited the Panel to discuss about the proposed compensation methodology.
7.5.1 Dr. Toh Mun Heng asked if there is any situation where the revised MEP is higher. The Chairman replied that there could be, and added that for such situations, there will be neither compensation nor claw-back as the revised prices reflect the correct price that should be used for settlement.

7.5.2 Mr Soh asked if consumers should correspondingly be compensated in such situations when revised prices are higher. The Chairman replied that the revised MEP reflects the correct price that consumers have to pay. The rationale for proposing compensation for generators when revised prices are lower is because generators had indicated their supply intentions, reflecting their marginal costs, via their offer prices.

7.5.3 Chairman added that there was previously an argument that if the price is revised, generators should receive the original MEP for their entire injection. However, to minimise the costs borne by consumers, EMC’s proposal was to compensate them for the losses as indicated by their offer prices. He added that the Panel had previously discussed the other possibility which is to identify the party which had caused the error and to seek compensation from that party accordingly. However, the Panel felt that if the cost is imposed on a particular party, for example the PSO and/or EMC, then EMC or PSO will factor this risk in and would request for more fees. Hence, the Panel at that time agreed to recover compensation from consumers.

7.5.4 Dr. Toh commented that from a consumer’s point of view, it seems like a bias one-sided proposal that only generators are compensated but not consumers. The Chairman disagreed and said that the principle is that the revised prices are the correct prices that consumers should be paying.

7.5.5 Mr Marcus Tan opined that SWEM is an ex-ante market and to be fair to generators, the market cannot expect generators which had already generated (and therefore incurred costs) in response to a high price to suffer losses. He noted that EMC’s proposal is based on offer prices for quantities which have been dispatched, which is not excessive.

7.5.6 In response to Dr. Toh’s query about the payment of compensation, the Chairman replied that consumers will bear the costs of compensation. However when MSCP impose financial penalties on market participants/service providers for breach of market rules the penalty amount also goes back to consumers.

7.5.7 Mr Soh asked about the benefit of this proposal compared to the current way of gencos seeking compensation via the dispute resolution process. The Chairman explained that the current market rules sets out the circumstances under which gencos can seek compensation and the dispute resolution process is used only when two parties are unable to agree on compensation matters that are allowed under the market rules. Currently the market rules does not provide for compensation to gencos that are adversely affected by a price revision event, the proposal will allow such generators seek for compensation and also set out the
methodology to calculate the compensation amount.

7.5.8 The Panel by majority vote supported the proposed compensation methodology.

The following Panel members voted in support of the proposed compensation methodology:

- Mr Henry Gan (Representative of the EMC)
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Mr Marcus Tan (Representatives of Generation Licensee)
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Phillip Tan (Person experienced in Financial Matters in Singapore)
- Ms Grace Chiam (Representatives of Generation Licensee)

The following Panel member voted not to support the proposed compensation methodology:

- Mr Soh Yap Choon (Representative of the PSO)

The following Panel member abstained:

- Mr Lawrence Lee (Representative of the market support services licensee)

7.6 Proposed Compensation Procedures

The Chairman then invited the Panel to discuss about the proposed compensation procedures, i.e. either EMC-initiated or MP-initiated.

7.6.1 Mr Gan commented that EMC-initiated compensation is more consistent, predictive and can be automated so that all eligible generators will be compensated, similar to the current compensation for GRFs which had their minimum stable load (MSL) modelled. MP-initiated compensation, on the other hand, will be manually processed, and more piecemeal.

7.6.2 Mr Gan added that EMC may have to process cases sent in by MPs which are not eligible for compensation. This may lead to an increase in unnecessary overheads. On Mr Gan’s point, Ms Loh clarified that for MSL compensation, if EMC did not calculate compensation for a MP and the MP felt that it should be compensated, they can also raise it to the EMC.

7.6.3 Mr Phillip Tan queried whether EMC-initiated compensation is more suitable given that EMC is a neutral party. Ms Loh replied that in either case, EMC would be involved in verifying the calculations.
7.6.4 In response to Mr Sean Chan’s query on whether EMC-initiated compensation implies that the calculation is automatic, the Chairman said that EMC-initiated compensation will be automated in EMC’s system.

7.6.5 Mr Sean Chan asked if it is possible for EMC to calculate the compensation manually first, while working on the system changes to automate the calculation. Mr Gan replied that the manual method is prone to errors, and also it is quite complicated and onerous as EMC will have to check various scenarios.

7.6.6 Mr Peacocke said that although EMC-initiated compensation procedure is preferable from a theoretical point of view, he is leaning towards MP-initiated compensation in view of the significant cost of implementation.

7.6.7 Mr Daniel Lee suggested proceeding with MP-initiated compensation, He suggested that automation be considered if there are many compensation claims in the future.

7.6.8 The Panel by majority vote supported the proposed MP-initiated compensation procedure.

The following Panel members voted in support of MP-initiated compensation:
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Phillip Tan (Person experienced in Financial Matters in Singapore)

The following Panel members voted in support of EMC-initiated compensation:
- Mr Henry Gan (Representative of the EMC)
- Mr Marcus Tan (Representatives of Generation Licensee)
- Ms Grace Chiam (Representatives of Generation Licensee)

The following Panel members abstained:
- Mr Soh Yap Choon (Representative of the PSO)
- Mr Lawrence Lee (Representative of the market support services licensee)

(Paper No. EMC/RCP/98/2017/07)

Ms Loh informed the Panel that, as part of the Panel’s mid-year review of the rules change work plan, EMC invited stakeholders to raise any urgent issues that they wished to be addressed. At the close of
submission, EMC received the following proposal:

- **Proposal:** Provision of real-time estimates of the reserve responsibility share ("RRS") for each GRF

EMC recommended that the RCP consider (i) urgency of the issue, and (ii) impact of the issue when deciding whether a newly raised issue should take priority over an existing work plan issue where work has not commenced.

| 8.1 | Proposal: Provision of real-time estimates of the reserved responsibility share ("RRS") for each GRF |

Ms Loh briefed the Panel that this proposal pertains to the establishment of a methodology to calculate an estimated RRS for each dispatch period of the market outlook scenario, pre-dispatch schedule scenario, short-term schedule and real-time schedule. The estimated RRS will not be used for settlement but serves as an indicative figure of the actual RRS. The proposal suggests publishing an estimate of the RRS in real-time so as to provide an indication of the reserve costs each GRFs could be charged. This is to improve transparency on each GRF’s reserve share arising from their scheduled generation level.

EMC assessed the urgency and impact of this issue to be medium. While the provision of the estimated RRS would improve information provided to GRFs, there is no immediate urgency to tackle this issue. As for impact, the proposal could potentially improve efficiency if such information indeed allows generators to make better decisions.

EMC recommends that the RCP include this proposal in next year’s Rules Change Work Plan prioritisation exercise.

**8.1.1 The Panel by majority vote supported EMC’s recommendations to include the proposal in next year’s Rules Change Work Plan prioritisation exercise.**

The following Panel members voted in support:

- Mr Henry Gan (Representative of the EMC)
- Mr Lawrence Lee (Representative of the market support services licensee)
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Mr Marcus Tan (Representatives of Generation Licensee)
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Phillip Tan (Person experienced in Financial Matters in Singapore)
- Ms Grace Chiam (Representatives of Generation Licensee)
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The following Panel member abstained:
- Mr Soh Yap Choon (Representative of the PSO)

8.2 Matters Arising from 92nd RCP Meeting

Ms Loh recapped that at the 92nd RCP meeting, the Panel decided to monitor and consider whether the issue “Proposed adjustments to reserve requirements” should be removed. The issue comprises the following 4 related proposals:

<table>
<thead>
<tr>
<th>Proposals</th>
<th>Description</th>
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<tbody>
<tr>
<td>a</td>
<td>Establishment of a new class of reserve to cater for intermittent generation</td>
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<tr>
<td></td>
<td>Introduce new class of reserve to cater to incremental reserve requirement resulting from increased IGS</td>
</tr>
<tr>
<td>b</td>
<td>Reserve requirements to reflect the largest contingency in the interconnected system</td>
</tr>
<tr>
<td></td>
<td>Factor in largest contingency in both Singapore and Malaysia when determining reserve requirement, as the two systems are interconnected</td>
</tr>
<tr>
<td>c</td>
<td>Introduction of an inertia adjustment factor to reserve requirements for enhanced power system security with increased solar generation</td>
</tr>
<tr>
<td></td>
<td>Adjust primary reserve requirement for inertia (higher requirement when solar generation is higher) Higher asynchronous solar PV generation would make arresting frequency deviations following contingencies more difficult</td>
</tr>
<tr>
<td>d</td>
<td>Alignment of market rules with transmission code in relation to reserves level</td>
</tr>
<tr>
<td></td>
<td>Adjust reserve requirement to at least procure amount of reserves required under Transmission Code</td>
</tr>
</tbody>
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8.2.1 Proposal a: Establishment of a new class of reserve to cater for intermittent generation

It was noted that the EMA had published a consultation paper “Intermittency Pricing Mechanism for IGS in the NEMS” on 1 August 2017, setting out the EMA’s proposed intermittent pricing mechanism for IGS. The consultation paper pertains to the reserve costs allocated to IGS, but does not propose any new reserve classes to deal with IGS.

EMC’s view is that a review on the impact of IGS on reserves should be conducted comprehensively. Hence, if the proposer feels that a new reserve class should be created, it should be submitted as part of the consultation to the EMA for consideration. Moreover, the EMA/PSO had directed a rule change to combine the existing three classes of reserve...
into two classes.

EMC recommended that the Panel remove this proposal from the work plan.

8.2.1.1 The Panel by majority vote supported EMC’s recommendations.

The following Panel members voted in support:
- Mr Henry Gan (Representative of the EMC)
- Mr Soh Yap Choon (Representative of the PSO)
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Mr Lawrence Lee (Representative of the market support services licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Lawrence Lee (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Ms Grace Chiam (Representatives of Generation Licensee)

The following Panel member abstained:
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Marcus Tan (Representatives of Generation Licensee)

8.2.2 Proposal b: Reserve requirements to reflect the largest contingency in the interconnected system

It was noted that there was no foreseeable urgency to tackle this issue since the interconnection agreement already required each country to provide sufficient reserve to cater for loss of largest online generating unit within their respective power systems. Nevertheless, this proposal pertains to the issue of reserve and could have an impact on system security.

EMC recommended that the Panel retain this proposal on the work plan for the proposal to be studied further.

8.2.2.1 Mr Peacocke said that the current reserve requirement formula does take into account the intertie status. The Chairman replied that the formula will check whether the intertie is on (i.e. interconnected) or off (i.e. not connected). If the intertie is on, the reserve requirement is lower and the PSO also allows for more primary reserve from interruptible load. Mr Soh confirmed that the interconnection power system size has been accounted for in the Market Clearing Engine.

8.2.2.2 The Chairman explained that from EMC’s perspective, the issue is whether enough reserve has been procured in the event that the intertie trips. Mr Soh replied that there is a protection system in place in the interconnectors to protect the equipment from overloading. He added
that the PSO currently does not monitor the Malaysia's power system and is therefore unable to know the size of the largest running generating unit in Malaysia. Mr Soh said that the current operating policy in the SOM clearly states that reserve is to cover the loss of the largest online unit in Singapore. In the worst case scenario when the interconnectors trip, the PSO will have to ensure that the power still goes on. He opined that the proposal should not be included.

8.2.2.3 The Panel **unanimously supported** removing this proposal from the work plan.

8.2.3 Proposal c: Introduction of an inertia adjustment factor to reserve requirements for enhanced power system security with increased solar generation

For the same assessment as Proposal a, EMC recommended that the RCP remove this proposal from the work plan.

8.2.3.1 The Panel **by majority vote supported** EMC's recommendations.

The following Panel members voted in support:
- Mr Henry Gan (Representative of the EMC)
- Mr Soh Yap Choon (Representative of the PSO)
- Mr Lim Han Kwang (Representative of Transmission Licensee)
- Mr Lawrence Lee (Representative of the market support services licensee)
- Mr Sean Chan (Representative of Retail Electricity Licensee)
- Mr Daniel Lee (Representative of Retail Electricity Licensee)
- Mr Luke Peacocke (Representative of Retail Electricity Licensee)
- Dr. Toh Mun Heng (Representative of Consumer of Electricity in Singapore)
- Mr Phillip Tan (Person experienced in Financial Matters in Singapore)
- Ms Grace Chiam (Representatives of Generation Licensee)

The following Panel member abstained:
- Ms Priscilla Chua (Representative of Generation Licensee)
- Mr Marcus Tan (Representatives of Generation Licensee)

8.2.4 Proposal d: Alignment of market rules with transmission code in relation to reserves level

It was noted that the Transmission Code stipulates the reserve capability of a generating unit, which is different from the system-wide reserve requirement determined endogenously within the Market Clearing Engine.

EMC recommended that the Panel remove this proposal from the work plan.
8.2.4.1 The Panel **unanimously supported** removing this proposal from work plan.

9. **Any Other Business**

9.1 Mr Toh Seong Wah informed the Panel that this RCP meeting will be the Chairman’s last meeting as he will be leaving EMC. Mr Toh would like to extend appreciation to the Chairman, on behalf of EMC and the industry, for his valuable contributions over the past 15 years to the market and the Panel, and wished him all the best in his future endeavours.

10. **Date of Next Meeting**

    The 99th RCP Meeting will be held on Tuesday, 14 November 2017.

There being no other matters, the meeting ended at 11.50a.m.

**Paul Poh**
Chairman

Minutes taken by:
Angeline Tan
Corporate Secretarial Executive