MINUTES OF THE RULES CHANGE PANEL
25th PANEL MEETING
HELD ON TUESDAY, 14 MARCH 2006 AT 10.05AM
AT ENERGY MARKET CO. PTE LTD
9 RAFFLES PLACE #22-01
REPUBLIC PLAZA, SINGAPORE 048619

Present:    Jomar Eldoy   Lim Ah Kuan
            Low Boon Tong   Robin Langdale
            Tay Swee Lee    Kng Meng Hwee
            Philip Tan Pei Lip    Koh Kah Aik
            Francis Gomez    Henry Gan

Absent with apologies
Dallon Kay   Dr. Daniel Cheng

In Attendance:  Dave Carlson   Paul Poh
                Poa Tiong Siaw   Teo Wee Guan
                Janice Leow   Wang Jing

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 24th Rules Change Panel Meeting

The Minutes of the 24th Rules Change Panel meeting held on Thursday, 12 January 2006 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 Matters Arising from the 24th Rules Change Panel Meeting held on 12 January 2006

The Panel noted that the matters arising as outlined had been completed.

4.0 Summary of Outstanding Rule Changes

The Panel noted the contents of the paper.
5.0 Monitoring List

The Panel noted the contents of the paper.

6.0 Modeling Phase-Shifting Transformer in MCE
(Paper No. EMC/RCP/25/2006/252)

This paper was to update the formulations in the Market Clearing Engine to model the Phase-Shifting Transformers (“PST”).

The Panel was informed that SP PowerAssets will be commissioning a PST in the transmission system in mid 2006 and this is to regulate power flows. The PST does this by changing the phase angle difference between its source and load voltages.

A PST is thus able to increase or reduce flows on the line by adjusting the voltage phase angle. By doing so, flows on other lines can be controlled to a certain extent and this can serve the objective of reducing line loading on some particular line(s).

The ability of a PST to regulate power flows need to be modeled in the MCE to ensure that the MCE models physical reality accurately.

Numerical examples show that the PST can help to relieve line constraints and thus prevent price separation. The use of PST is substantially more cost-effective than the conventional method, i.e. laying new lines, to relieve transmission constraints.

The Panel was also informed that because the Singapore Wholesale Electricity Market uses nodal pricing, regulating power flows could have impact on prices. When considering this proposal, the Technical Working Group (TWG) considered that market participants could be financially impacted. The TWG requested SP PowerAssets to address the following at the RCP Meeting:

1. market participants had received no prior consultation on the objective of installing PSTs, and the impact the operation of PSTs would have on power flows; and
2. whether installation of PSTs is the best way to achieve that objective.

SPPG accepted the invitation to address TWG’s concern, though there is no set procedure and it is not a requirement for SPPG to consult market participants on their development projects. The Panel then invited Mdm. Lee Yau On of SP PowerGrid Limited to address the panel.
Mdm. Lee presented the following:

**Objective of installing PST** – to increase the power transmission capability in the north-eastern block to meet the N-1 security requirement. For example, with the current network configuration, a particular line in this block can be loaded to 90% of its capacity under normal operating condition. Outage of a line supplying the same load would cause this line to be substantially overloaded. This means the N-1 security requirement cannot be satisfied. On the other hand, in the above example, some other lines in the same network block are utilized at less than half of their capacity under normal operating condition.

**Why PST?** – The conventional method to relieve constraint is to introduce a new circuit parallel to the overloaded line in the system. Due to long and congested cable route, the cost of circuit reinforcement would be very high. Instead, one unit of PST can be installed in the system at a significantly lower cost.

**What is PST?** Power flow control device. It can control the power flow on the line where the PST is installed by adjusting the phase angle. This enables the power flow through the parallel circuits to be indirectly controlled.

The effectiveness of PST in power flow control was illustrated by simulation results as an example: With a phase angle shift of 2 degrees on the PST, the loading of highly loaded circuits was significantly reduced such that there was no circuit overloading under N-1 condition. The example also showed that phase angle adjustment may not be always necessary to relieve circuit overloading under N-1 condition.

**Conclusions** – PST is a device that can control the power flow. It provides a cost–effective solution to remove network congestions. This project is expected to be completed in 3Q of 2006.

The Panel thanked Mdm. Lee for her presentation and Mdm. Lee left the meeting.
The Panel was informed that the simulation result showed that the proposed formulation is accurate in modeling the behavior of phase-shifting transformer. The TWG endorsed that the rule modification proposal to amend the MCE formulation in Appendix 6D and 6G of Chapter 6 and Chapter 8 of the Market Rules is accurate in modelling the PST. Simulation also showed that PST can help relieve constraints and prevent price separation.

Mr. Philip Tan queried about the costs of such modification, the cost for MCE enhancement and how the MCE performance will be affected. EMC confirmed that the necessary MCE system development will be carried out by EMC’s maintenance contractor and the cost is within EMC’s budget. As for the impact on the MCE’s performance, it is negligible as the changes to the system are minor.

Conclusions

The proposed model is effective in describing the physical characteristics of PST. The application of PST can relieve loading constraints and thus prevent price separation. Simulation result also shows that with the proposed formulations to model PSTs, the MCE can simulate load flows in the system with sufficient accuracy.

EMC recommended that the RCP

(a) support the rule modification proposal to Appendix 6D and 6G Chapter 6 and Chapter 8 as set out in the Annex 1;

(b) agree that this rule change paper not be published because of the presence of information on transmission facilities which the EMA had instructed should not be released to the public domain. However, the text of the rule modification proposal will still be published.

The Panel supported EMC’s recommendation and to make the necessary recommendation to the EMC Board for adoption.
7.0 Shortening of Settlement Cycle  
(Paper No. EMC/RCP/25/2006/249)

The rule change modification proposal is to shorten the wholesale electricity market settlement cycle.

Based on the savings and cost figures gathered from market participants and service providers, the financial costs of shortening the NEMS settlement cycle significantly outweigh the savings. The RCP noted that interest savings (for retailers/MSSL) and interest costs (for generators) should not be significantly different. This was not reflected in the survey result. However, the RCP also noted that even if the figures exclude interest cost and savings, the net financial savings would still be insignificant. Given the presence of other non-quantifiable costs, the RCP could not establish clear efficiency gains from this change.

The Panel therefore recommends that the EMC Board not adopt the rule modification proposal to shorten the settlement cycle.

8.0 Compensation Arising from Market Energy Price Revisions  
(Paper No. EMC/RCP/25/2006/253)

This paper assessed EMC’s proposal to compensate generators who were paid a revised market energy price (MEP) that was lower than the offer price(s) for the energy produced in real-time. Currently, the market rules do not provide compensation for the affected generators.

The Panel was informed that offering compensation to the affected generators is not only fair, but also boosts industry players’ confidence of the market and enhances certainty for the generators.

EMC proposed that when a generator, as result of a price revision, was paid a revised MEP lower than the offer price for a certain quantity of energy it had produced in real-time, that generator would be compensated based on the difference between the revised MEP and the offer price for that quantity.
EMC also proposed two possible options for the implementation of the proposed compensation arrangement. The table below compared these two options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Option 1</th>
<th>Option 2¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application for Compensation</strong></td>
<td>Automatic compensation by EMC (i.e. affected gencos do not need to submit any compensation claims to EMC)</td>
<td>Compensation will be based on a claim submitted by a MP (the ‘claimant’) to EMC. The claim should be made within 10 business days. Within 20 business days of receipt of a request for compensation, EMC shall notify the claimant whether he/she is eligible for compensation and the amount payable.</td>
</tr>
<tr>
<td><strong>Eligibility for Compensation and Compensation Payable</strong></td>
<td>EMC shall determine the eligibility for compensation, and the amount of compensation payable in accordance with the proposed Appendix 6K.1</td>
<td>Same as Option (1)</td>
</tr>
<tr>
<td><strong>Compensation Recoverable</strong></td>
<td>EMC shall calculate determine the amount to be recovered from each market participant’s (MP’s) load based on: [\frac{\text{total WEQ for a MP}}{\text{Sum of WEQs for all MPs}} \text{x (total compensation amount payable)}]</td>
<td>EMC to recover the amount from loads via the Monthly Energy Uplift Charge (MEUC).</td>
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</table>

¹ Under Option (2), the timeline relating to ‘Application for Compensation’ and ‘Payment of Compensation’ follows that provided for under section 3.11 of Chapter 3 (‘Application for Compensation’) of the Market Rules.
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<tr>
<th><strong>Timeline for Payment of Compensation</strong></th>
<th><strong>EMC shall complete processing the compensation within 5 business days after the preliminary settlement statements of the applicable MPs for the relevant dispatch day have been issued:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>****</td>
<td>The compensation amount payable and/or the amount recoverable will appear in the next available preliminary settlement statements of the applicable MPs.</td>
</tr>
<tr>
<td>****</td>
<td>Payment shall be made in accordance with the settlement timetable set out in section 5.2 of chapter 7.</td>
</tr>
</tbody>
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<thead>
<tr>
<th><strong>Cost and time required for implementation (Estimates provided by EMC – Details are attached in Annex 2)</strong></th>
<th><strong>Estimated 182 man-days (approximately 9 months) required to carry out implementation work.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rules will become effective in about 15 months after they have been approved by the EMA.</strong></td>
<td>Perform externally. (Estimated IT costing ranged from $175,000 to $236,000.)</td>
</tr>
<tr>
<td><strong>Perform using in-house resources. (Estimated internal costing of $48,000.)</strong></td>
<td><strong>Estimated 50 man-days (approximately 2.5 months) required to carry out implementation work.</strong></td>
</tr>
<tr>
<td><strong>Rules will become effective in about 4 months after they have been approved by the EMA.</strong></td>
<td>Perform using in-house resources. (Estimated internal costing of $48,000.)</td>
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</table>

EMC presented the pros and cons for Option 1 and Option 2.
EMC noted that there are two main disadvantages associated with Option 2. One, it is administratively more cumbersome since affected generators would need to submit a claim for compensation to the EMC. Two, the manner in which compensation cost is being recovered violates the allocative-matching principle.

However, given the relatively infrequent re-runs to date (in 2005, there were re-runs for only 53 out of a total of 17,520 dispatch periods), EMC do not consider the disadvantages of Option 2 to have a significant impact on the affected generators. Also, Option 2 is significantly cheaper and requires less time to implement, compared to Option 1. Hence on balance, EMC proposed that the Panel support Option 2 for implementation.

Discussion among Panel members

Mr Tay Swee Lee brought to the attention of the RCP that this proposal arose out of the incident which happened on 11 Nov 05. In that incident, the MCE determined the original real-time schedules (RTS) based on the network status file received at 10 minutes before the start of the relevant dispatch period. Based on the RTS, an expensive GT unit was run up based on a market network node (MNN) price of $3,068.41/MWh for that GT unit. However, after the event, there was a re-run. Based on the re-run schedule, that GT was not even scheduled to run. The re-run (i.e. revised) MNN price was $128.13/MWh. That GT, which had run based on the original RTS, was paid this lower revised price. This revised price was below its offer price. The price could not even cover the fuel (i.e. in this case, diesel) costs. As this scenario was not thought of when the Rule Change for price revision was made and hence provided for in the Market Rules there was no avenue for the affected generator to claim compensation for that GT unit.

(EMC-Post meeting note - the provision for price revision, subject to certain conditions, already existed in the market rules provided by PA consulting. Subsequent changes were to clarify timelines for price revision and to expand on the situations where price revision will be allowed.)

According to Mr Tay Swee Lee, the network status file taken at 10 minutes before the dispatch period was correct. Referring to the case where EMC re-runs the MCE ‘to ensure that the input data used by the MCE in determining the final prices are correct and complete he commented that there must be a cut-off time where the network status file used by the MCE should be taken as final when determining the RTS. He added that re-run of the MCE violates ex-ante pricing regime of the market. It also undermines confidence generators have of the market as original prices may change ex-post.
In reply, Mr. Henry Gan explained that the network status file used by the MCE was a snap-shot of the grid conditions. When the snap-shot was taken for the affected period on 11 Nov 2005, the network status file captured a transitory switching which was in-progress. Technically speaking, the network status file correctly captured what happened at that point in time. However, the transitory switching was completed very shortly after the snap-shot was taken and the completion happened before the start of the dispatch period. Hence, the original network status file could not be taken as a true representation of the grid conditions for that affected period. This gave rise to a re-run to ensure that the prices for settlement reflect as closely as possible the actual network conditions for that dispatch period.

Mr. Henry Gan noted that the price revision for P26 on 11 Nov 05 had an adverse impact on the affected generator. However, he added that there could be situations where price revision would favour the affected generators (an example is where the revised price turned out higher than the original price which could be negative initially). He stressed the need to look at both sides of the picture in relation to price revision.

Mr. Kng Meng Hwee objected to the proposal. In his view, we should not be “correcting one wrong with another wrong” as in the first place, the market should not allow any re-run given that we have ex-ante pricing. He stated there is no valid reason for re-run under each of the existing cases permitted under the market rules. He stressed that in an ex-ante market, the prices determined are binding on both the sellers and buyers. He was unaware of any other market operator who could change the price of a good for settlement (in an ex-ante market) after the good has been consumed.

Mr. Kng also commented that one of the reasons mentioned by EMC for rerun was that “original network status file could not be taken as a correct representation of the grid conditions for that affected period”. If this is accepted, then theoretically EMC would have to perform a re-run for every dispatch period as the network status file that captures the grid condition 10 minutes before the start of a dispatch period would never have the same conditions for that dispatch period. More so if there was generator or transmission outage within the 10-minute time period prior to start of the dispatch period concerned.

Mr. Kng further suggested that in cases where the MCE fails to produce the RTS, EMC should use the prices contained in the STS, PDS or MOS (in such order) for settlement for the affected dispatch period. This is because, in the absence of RTS, the PSO would have dispatched the generators based on those schedules (in that order). It only made sense to pay the generators according to the prices contained in those schedules if the generators have delivered energy and reserves based on those schedules.
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Mr. Henry Gan did not fully agree with Mr. Kng’s earlier comments. To him, the market is only ‘partially’ ex-ante and the market has a hybrid of both ex-ante and ex-post characteristics. He gave an example where settlement of energy is based on ex-ante price but used ex-post quantity (i.e. actual metered quantity). The intent of the re-run is to ensure that the prices determined by the MCE are correct for settlement in that they reflect the underlying market conditions.

KMH - (Post-meeting note: The quantity-in-variance ex-post is still paid based on the ex-ante price. In his view, this quantity-in-variance is an inherent characteristic of electricity market and for an ex-ante market, it should be taken as implied option to supply more at the same price by the seller, or implied option to consume less by the buyer. This is different from ex-post pricing, i.e. changing the price after has been delivered. Even in the previous Pool (SEP), where there were both ex-ante & ex-post pricing, the ex-post price only applied to the quantity-in-variance, not the original ex-ante quantity. The principle then was to incentivise seller to deliver more when the demand was higher than expected, and discouraged non-delivery or shortfall.)

Mr. Henry Gan also raised a query on the timeline for payment of compensation under Option 1. Specifically, he asked why the need to state that the processing of completion must be completed within 5 business days after the release of the applicable preliminary settlement statement (PSS). In an automated system, the relevant data would have to be supplied to the system automatically at a specified time. Also, with regard to the dispatch instructions to be supplied by the PSO in the absence of RTS, Mr. Gan commented that such inputs would have to be supplied automatically to the system at a specified time so as to allow the system to calculate the compensation amount alongside when the metering data comes in.

To that, Mr. Paul Poh explained that Option 1 does not necessarily mean EMC will have an automated system with ‘straight-through’ processing (i.e. without any manual processing). “Automatic” in this context is with reference to the application for compensation by affected MPs, which means MPs do not need to monitor the situation and submit a claim to EMC. The ‘5-business day’ is to give EMC enough time (and hence, the flexibility) in processing the compensation amount, however EMC chooses to do it (i.e. be it ‘straight-through’ or a mix of automated or manual processing).
With regard to the submission of dispatch instructions by the PSO in the absence of RTS, Mr. Teo Wee Guan clarified that the proposed timeframe for PSO to do so is within 3 business days after the date of the dispatch period. This means the data from PSO would come in even before the relevant metering data from MSSL comes in (which is on D+5 business day).

As it is difficult to visualize the timeframe involved, Mr. Henry Gan requested that a timeline of events be drawn up, for both Option 1 and Option 2, showing the obligations of the relevant parties with regards to submission of data, processing of compensation claims and payment of compensation.

Mr. Koh Kah Aik then raised an issue concerning the basis of compensation which is based on the difference between the revised price and offer price(s) associated with the affected quantities. He questioned the rationale for using such a basis. In his view, affected generators should be paid the difference between the revised price and highest offer price associated with the cleared P-Q offer band for the entire quantity of energy generated.

The Chairman was of the view that Mr. Koh’s comments had merit as traders in offering their price quantity pairs may offer lower prices than their full variable cost as they wish to secure dispatch over their competitors. Thus the payment over the entire quantity is necessary to recover their full variable cost.

Arising from the discussion, the Panel requested EMC:

- to provide Panel with the timeframe and budget required to conduct a review on price revision in SWEM; and
- to re-examine the basis and proposed formula to be used for calculating the compensation amount for the affected generators.

and report to the Panel at the next Panel meeting.

9.0 **Imposition of Default Levy** (Paper No. EMC/RCP/25/2005/254)

The Panel was informed that, at the 24th RCP Meeting in January 2006, the Panel voted to support the proposal to allocate any default levy only to net creditors. EMC was tasked to propose changes to the text of the market rules to reflect the proposal.

Mr Poa Tiong Siaw informed the Panel that the paper submitted includes all analyses from the conceptual proposal and the additional analyses on scenarios brought up in past RCP meetings. It also includes the proposed changes to the text of the Market Rules to reflect the Panel’s support of imposing default levies only on net creditors.
Mr. Poa then presented the proposed changes to the text of the markets by highlighting three main elements of change:

1. Changes to effect the conceptual rule change (i.e. the new default levy allocation arrangement)
2. Plain English drafting
3. Changes for clarification purposes

EMC also proposed that the current methodology of calculating the share of default levy for each liable party be retained.

Mr. Lim Ah Kuan then presented a scenario to the Panel. He referred to a scenario in the paper that contemplates all generators producing below their vesting contract quantities and hence to “pay” the MSSL vesting credits. In this situation, the MSSL becomes the sole net creditor in the wholesale market and has to singular bear any default levy imposed. Mr. Lim commented that this would be unfair to MSSL because the vesting credit it receives eventually had to be passed on to contestable consumers or retailers.

Mr. Poa replied that the “pass on” of vesting credits do not take place in the wholesale market. While the MSSL does not retain the vesting credits, at the wholesale market level, it is still a creditor. The correct wholesale market design is to have a wholesale market creditor bear default levies, regardless of how it deals with the vesting credits outside the wholesale market.

Mr. Lim reiterated that MSSL is required by EMA to facilitate the market by playing the role of an intermediary between the gencos and retailers/consumers for the vesting contracts. When the vesting contract mechanism is designed and assigned to MSSL as part of market feature, the default levy is designed to be imposed on and shared among gencos and retailers, not on net creditors. If a certain feature in the market is subsequently changed, especially in the upstream at wholesale level, it will naturally have an impact on the whole market, including retail. Hence, the full impact of the proposed change will have to be addressed so that no party is unfairly disadvantaged in the process, especially since the market is originally designed as a whole and not in bits of wholesale and retail.

Agreeing with Mr. Poa, the Chairman cautioned against linking risk exposure within the wholesale market to activities outside it. The Vesting Contract regime is a temporary regulatory regime. Settlement at the wholesale level of vesting contracts extended only to those between gencos and the MSSL (Gencos’ VC Counter-party).
Mr. Lim then informed the Panel that MSSL would be submitting an official comment on the subject based on the scenario just described.

On the methodology to apportion a default levy to each liable party, Mr. Robin Langdale re-iterated his support for the basis used to be the value of invoices over a considerable period of time. He considered that an event of default is unlikely to be triggered by transactions in a single day. To this, Chairman replied that the electricity market is markedly different from other markets in its ability to created price volatility of over hundreds of folds. It was very likely that a single day’s transaction can create a default.

Mr. Poa also concluded that the current methodology is consistent with design principles. There was hence no real compelling reason to change the basis used in calculating default levy.

In view of the intra-class inequity that the current arrangement creates within the retail class of MPs and the good principles reflected in the alternative method, EMC proposed the adoption of the alternative method.

(Mr. Koh Kah Aik and Mr. Low Boon Tong left the meeting)

As there was no quorum for any decision to be made for this rules change proposal, EMC noted the Panel’s comments and would table the proposal for presentation at the next Panel Meeting.


This paper was deferred and will be presented at the next Panel Meeting.

The Panel invited Mr. Tan Zing Yuen of EMC to the meeting.

11. Treatment of Multi-year Charges
(Paper No. EMC/RCP/25/2006/02)

As there was no quorum for the Panel to comment, EMC was requested to circulate (via e-mail) the paper for the Panel’s comments.
There being no other matters, the meeting ended at 2.30pm with a vote of thanks to the Chair.

JOMAR ELDOY
Chairman

Minutes taken by:
Eunice Koh
Market Panel Administrator