Energy Market Company

RCP PAPER NO. : **EMC/RCP/78/2015/CP55**

SUBJECT : **INCREASE IN TRANSPARENCY OF MARKET INFORMATION ON TRANSMISSION CONGESTION AND PRICE SEPARATION**

FOR : **DECISION**

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DATE OF MEETING : **10 MARCH 2015**

Executive Summary

With the increase in new generation capacity in Jurong Island, the excess supply has led to more frequent occurrence of transmission congestion and price separation events in the south-west block of the transmission system.

This proposal seeks to provide more information on transmission constraints, including the provision of a forecast of transmission constraints and quantitative analysis of price separation events caused by transmission constraints, so as to allow Market Participants as well as Power System Operator and Transmission Licensee to better understand and manage transmission congestion from an economic point of view.

After consultation with the industry, we conclude that the information and the simulation proposed to be made would not be useful.

EMC recommend that the Rules Change Panel do not support this proposal.

At the 78th Rules Change Panel meeting, the Panel by majority vote decided **not to support** this proposal.

1. Introduction

This paper assesses the proposal to require EMC to prepare a report on a regular basis assessing the impact of transmission constraints on market outcomes.

2. Background

2.1 Half-Nodal Pricing in SWEM

Nodal Pricing (for Generators)

Nodal Pricing is a method of determining prices in which market clearing prices are calculated for a number of locations/nodes in the transmission system. Each node represents the physical location on the transmission system where energy is injected by generators or withdrawn by loads.

The nodal prices discovered at each node represents the locational value of energy, which includes the cost of energy and the cost of delivery (including transmission loss and congestion). By incorporating the effect of transmission losses and congestion in prices, the prices of generation offered in two different locations can truly be compared. It also means that parties at any location on the system can be exposed to the true cost of production and consumption at that location, which can – in both short and long term – enable better decision making in production/investment and consumption.

In the Singapore Wholesale Electricity Market (SWEM), each generator is paid at the nodal prices at the node where the generator is located.

Uniform Pricing (for Load)

Although full nodal pricing has been implemented in the Market Clearing Engine (MCE), the SWEM chooses to take a half-nodal pricing approach. While generators are paid the nodal price produced by the MCE, consumers are charged a uniform price regardless of their location - known as the uniform Singapore energy price (USEP) - so that they are not locationally advantaged or disadvantaged.

USEP is calculated from the weighted average of the nodal prices at all of the nodes that withdraw energy. The nodal energy price at each node is weighted by the energy withdrawn from that node. In this way, the total amount paid by all consumers at USEP is the same as the total amount if each consumer were to pay at their respective nodal price.

The Singapore transmission system has robust capacity and instances of constraints that impact the nodal prices that would otherwise be faced by loads are fairly rare.

2.2 Transmission congestion and its impact

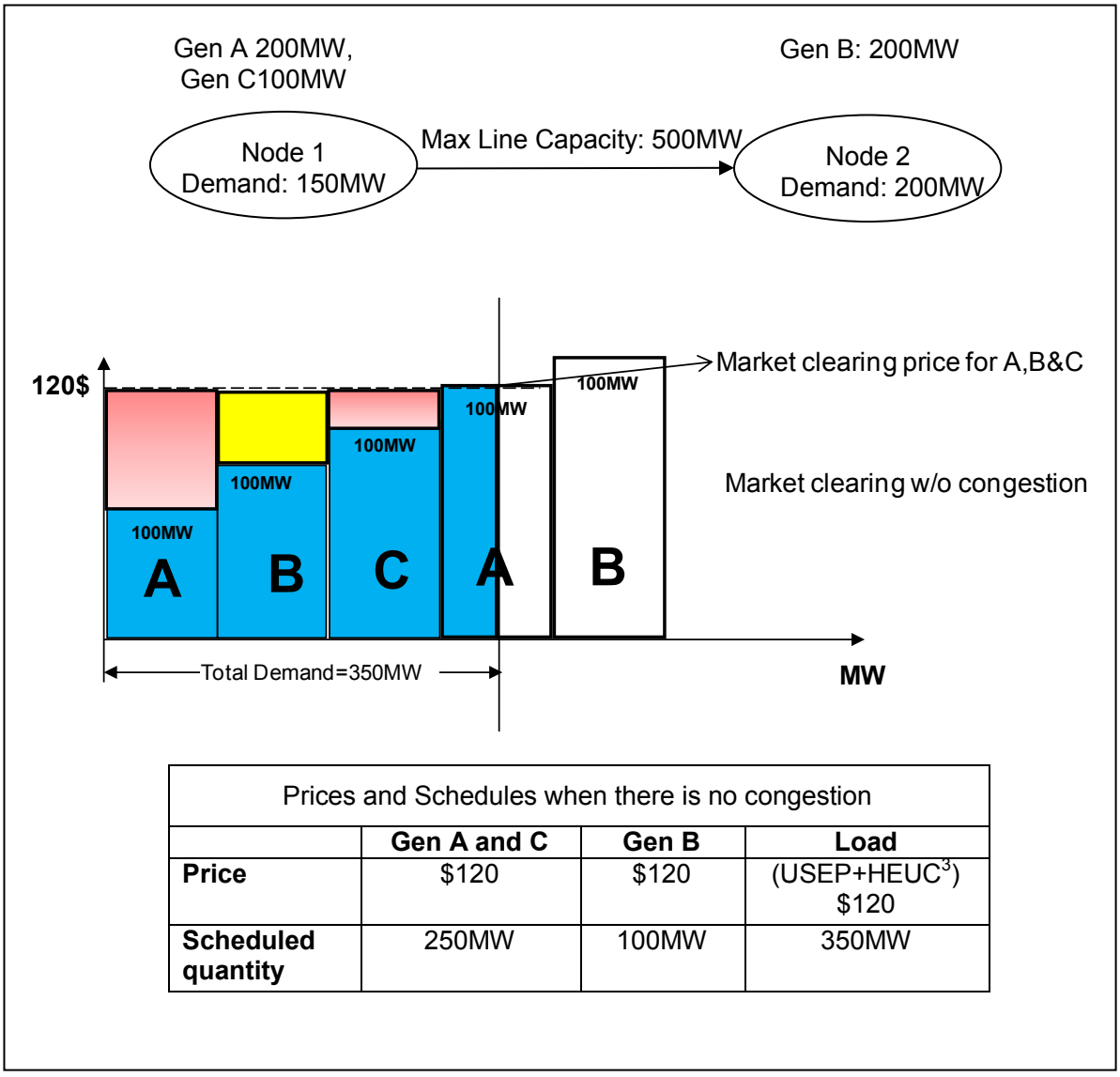
A transmission constraint can be caused when a particular transmission line reaches its thermal limit or when a constraint imposed on transmission line(s) by the PSO (security constraint[1]) is binding.

[1] In SWEM, the N-1 transmission requirement is not modeled in the MCE as the transmission line risk is not considered as a risk in the system when the market was first designed. In practice, the PSO may impose security constraints instead, so that any transmission line risks can be modelled into the MCE's schedules.

When there is a binding transmission constraint in the system, it would cause out-of-merit dispatch of generators and an increase in total generation cost at the system-wide level. Consequently, this translates into changes to the nodal prices and schedules of generators.

Figures 1 and 2 below illustrate how a transmission constraint would affect the generators schedules and the energy prices.

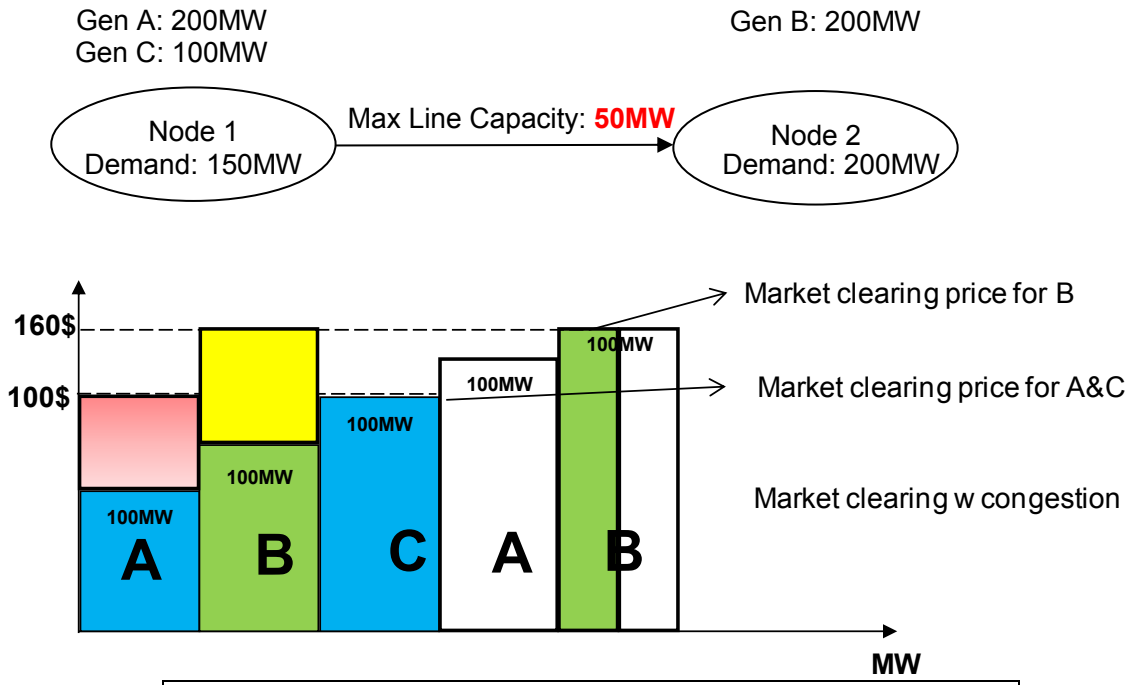
Figure 1: Market Clearing (without Congestion)[2]



Prices and Schedules when there is no congestion			
	Gen A and C	**Gen B**	**Load**
Price	$120	$120	(USEP+HEUC[3]) $120
Scheduled quantity	250MW	100MW	350MW

[2] For simplicity of illustration assume a loss-less line.
[3] USEP, the volume weighted average price of all load withdrawal point, is $120. Assuming no transmission loss, the HEUC (caused by transmission constraint) in such case is zero.

Figure 2: Market Clearing (with Congestion)



Prices and Schedules when there is congestion			
	Gen A and C	**Gen B**	**Load**
Price	$100/MWh	$160/MWh	(USEP+HEUC[4]) $125.71
Scheduled Qty	200MW	150MW	350MW

It can be seen that when transmission congestion happens (as in Figure 2), the following market outcomes are expected:

- For suppliers, generators located at the receiving/downstream end of the congested transmission line (i.e. generator B) will be scheduled to provide more energy at a higher cost. As a result, it will also receive higher nodal prices ($160 instead of $120) and potentially a higher producer surplus (shown by the yellow shaded area). However, generators at the sending/upstream end of the transmission line (i.e. generator A and C) will receive lower nodal prices, with less energy scheduled. Their producer surplus (as shown by the pink shaded area) is likely to be lower.

- For consumers/retailers, depending on the severity of the price separation caused by the transmission constraint, the energy price paid (i.e. USEP+HEUC) could be higher or lower. This depends on the increase or decrease in overall producer surplus, which is contributed by the following factors:

[4] USEP = $\sum_{(\text{all nodes})}$(nodal price x demand)/ Total Demand
= ($100 x 150MW+$160 x 200MW)/(150MW+200MW)
= $134.29;
HEUC = [$\sum_{(\text{all generators})}$(nodal price x scheduled generation) - USEP x Total Demand] / Total Demand
= [($100 x 200MW + $160x 150MW) -($134.29 x 350MW)]/ 350MW
= $-8.57

a) the change in quantity of generation that is scheduled at both ends of the constraint; and
b) the degree of increase and decrease in nodal prices at both ends of the constraint.

The example in Figure 2 shows a case where (USEP+HEUC) is higher due to a transmission congestion. The reverse case, where (USEP+HEUC) is lower when a transmission congestion occurs, is shown in Annex 1.

2.3 Information available to Market Participants with regards to Transmission Constraints

Currently, both forecast and finalised prices[5] of all nodal prices and the (USEP + HEUC) are available on EMC's website. EMC also prepares an analysis of price separation incidents in the (private) monthly trading reports, where the causes are explained.

However, information on the physical transmission system is not available to market participants. Information which is necessary for market participants to assess and understand the impact of transmission constraints, such as transmission line ratings, configuration of the transmission network and connection points of generation facilities, are not published due to security reasons. Similar to transmission constraints, when security constraints are applied, details such as the identity of the transmission equipment and/or generation facility that the security constraint is imposed on, are not explicitly revealed to all market participants either.

3. Analysis

In general, the proposal seeks to provide greater transparency on the financial impact of transmission congestion and price separation events. Specifically, the proposer requested that EMC should prepare a report analysing the causes and estimated economic cost of the congestion/constraint (e.g. by comparing the net benefit of the MCE solution compared to an unconstrained solution).

3.1 How Transmission Constraint Information is Released in Other Jurisdictions

In US and Australia electricity markets, unlike in SWEM, transmission congestion is more common and financial transmission rights (FTRs) are normally implemented in these countries to assist stakeholders in managing the risks arising from transmission constraints.

It is observed that in these markets, much effort is made to increase the transparency of transmission congestions to help stakeholders better manage the costs and risks associated with transmission constraints and facilitate the trading and allocation of FTRs.

US Electricity Markets

The US markets generally adopt locational marginal pricing for energy. In NYISO, ISO-NE and MISO, the energy, transmission and congestion components[6] of locational marginal prices are published individually. Market participants are thus able to see the "cost of congestion" at each individual node for each trading period.

[5] HEUC is only available in the finalised prices.
[6] Congestion component is calculate based on out-of merit generation dispatch prices relative to an assumed unconstrained reference point. In this way, the congestion component versus energy cost is arbitrary depending on the reference point chosen.

Some ISOs also conducts congestion analysis as part of their regular reliability planning studies, where "the costs and benefits of generic alternatives to alleviate that congestion"[7] will be examined.

Australian Electricity Market

"The Australian Energy Market Operator (AEMO) is required under the National Electricity Rules (Rules) to establish a congestion information resource (CIR), which will consolidate and enhance existing sources of information relevant to the understanding and management of transmission network congestion risk.[8]"

Information published covers:

- Congestion related policies and procedures that are used in management of network congestions;
- Network Status and Capability, including information about anticipated and historical transmission equipment outages and its implications of those outages for power transfer capability;
- Statistical Reporting Stream, that provides stakeholders with specific views of the congestions, such as analysis on the prices, performance on the interconnectors and specific incidents reports; and
- Updates on most significant current developments that impact network congestion, such as transmission network development plan and Transmission Network Service Provider's forecast of potential constraints and its proposed ways to alleviate these constraints.

3.2 Analysis of Proposal

3.2.1 Transparency of the cause of Transmission Constraint in SWEM

Table 1 below summarises the information related to transmission constraints which are currently being provided.

Table 1: Information related to Transmission

Publication	Frequency of Updates	Content	Released to
Adequacy and Security Assessment Report (ASA Report)	Monthly and Daily	• Transmission equipment outage plan (including name of equipment, rating and outage period) • Forecast of transmission line congestion (and the block that the security constraint will be applied onto and its corresponding security limit) Monthly ASA report covers a 12-month period. Daily ASA report covers a 14-day period.	Market Participants and all data subscribers
Annual Equipment Outage Plan (AEOP)	Annually	Transmission Equipment Outage Plan (including name of equipment on planned outage, rating and outage period)	Market Participants and all data subscribers

[7] NYISO- Reliability Planning Process Manual, source: http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/rpp_mnl.pdf

[8] Extracted from: http://www.aemo.com.au/Electricity/Market-Operations/Congestion-Information-Resource

Compared with practices in other electricity markets, information on transmission constraints released in SWEM is relatively low. This is mainly due to the following two reasons:

(a) National Security concern. Back in 2004, EMA determined that information on generation and transmission facilities, including but not limited to their identity, location and availability, should not be released to the public domain due to implications on national security.

(b) Historically, when the SWEM was designed**,** the transmission system in Singapore was considered robust and congestion free. Transmission lines were also not considered as risks to the system and not considered in the market clearing process given the "significant capacity and redundancy in the transmission system".[9] Thus the demand for information from market participants was less pressing.

However, with the recent increase in new generation capacity in Jurong Island, it has led to a situation of excess supply and some transmission constraints in the south-west block of the transmission system.[10]

In 2013, the PSO applied security constraints for 55.6% of the year to limit the generation from the south-west block to manage the transmission risk. In total, security constraints were binding for 131 periods, with the price difference between the two ends of the transmission constraint ranging from less than $10/MWh to above $2000/MWh[11]. In 2014, security constraints were applied for 68.9% of the year, during which security constraint binding were observed in 55 periods with average price difference of $88/MWh.

EMC's proposal

With transmission congestion becoming more prominent in SWEM and potentially having a significant financial impact on MPs, information on transmission congestion that can help market participants understand the cause of the price separation events and assess the impact of the transmission constraint could be increased. Such information includes:

a) Transmission congestion could be identified from the market outlook scenarios [12] produced by the MCE, by checking if the scheduled load flow on each transmission line has reached the line limit. The forecast schedules produced by the MCE take into account the latest transmission equipment outage schedules as well as generators' offers, which would serve as a more accurate indicator of the potential transmission congestion in the upcoming dispatch periods. EMC can inform the market through advisory notices and provide the identity and capacity of the transmission line(s) that has reach or exceeded its capacity.

b) If the transmission constraint occurred in the real-time schedule and caused a price separation, EMC should also reveal the identity and capacity of the congested transmission line(s) in its regular trading report.

c) Where a security constraint is to be applied to transmission lines, the PSO should provide details of the security constraint, such as the identity and capacity of the transmission lines that the constraint is applied onto, the security limit, and the dispatch periods that the constraint is applied for.

[9] Wholesale Market Design, by PHB Hagler Bailly
[10] EMA Information Paper: *Developments In the Singapore Electricity Transmission Network*
[11] NEMS Market Report 2013
[12] The market outlook scenario is produced once a day and covers up to 7 days of forecast dispatch periods.

3.2.2 Proposed Study on the Economic Cost of Transmission Constraints

The proposer also requested a simulation study to be carried out for all transmission congestion cases so as to estimate the economic cost of such incidents. By simulating the scenario where all transmission constraints are removed and comparing the net benefit values with the results in dispatch runs, it would provide an estimate of how much generation is scheduled out-of-merit and its consequential cost to the society and consumers.

Potential benefits

While nodal prices, which indicate the value of energy and any congestion cost at the given nodes, are good enough quantitative indices for market players (suppliers and consumers) to make generation and consumption decisions, we also recognise that, other than prices, the proposed study can potentially provide the following information, which might be useful to various stakeholders.

- **Pool prices and schedules:** for consumers and generators, a comparison with the prices and schedules under unconstrained situations would allow them to quantify the underlying cost or benefit resulting from the transmission constraints

- **Net Benefit:** In addition to prices and schedules, the proposed study would allow a comparison of the net benefit under congested and congestion-free scenarios, which can serve as an indicator of the economic cost of the transmission constraints and security constraints. This could facilitate the transmission licensee and the PSO in their decisions for planning grid expansion and determining security constraints.

Limitations

However, we must be mindful that the proposed study has various limitations.

First, transmission constraint is a physical constraint inherent in the power system that must be respected in the market clearing process. The study as proposed assumes that transmission congestion can be completely removed at no cost to the system, which is a hypothetical counterfactual that may not be achievable. In reality, there may not always be a feasible alternative to completely remove all transmission congestion in the system. Therefore, the market outcomes derived under such assumptions may not objectively reflect the market conditions.

Secondly, when MPs are aware of a transmission constraint or security constraints in place, some generators may have changed their offer prices to reduce the impact on price separation arising from transmission constraints. Therefore, their offer prices may not be reflective of the generators' marginal cost, which will also affect the simulation results.

EMC's proposal

We recommend that the proposed simulation study be carried out only for identified transmission constraints cases, where a solution to remove the constraints is available.

Specifically, EMC proposes the simulation study should be carried out, ex-post, for the following two types of price separation cases[13]:

1. Price separation cases due to binding security constraints, by removing the security constraints in the simulation run; and

[13] Price separation cases refer to those that persist after prices are finalized.

2. Price separation cases due to binding transmission constraints that are caused by outage of transmission equipment, by connecting the transmission equipment back to the grid[14] in the simulation run if such transmission equipment can be easily identified.

After the simulation study, the following outcome of the simulation should be released to MPs:

1. Changes in the net benefit by comparing the net benefit value of the simulation run and the original run[15]
2. Nodal energy prices and (USEP+HEUC);
3. Reserve prices and regulation price;
4. Schedules for generation registered facilities and load registered facilities (released to respective MPs only)

4. Implementation process

The estimated time and cost to implement the release of information relating to transmission congestion (as described under section 3.2.1) is shown in Table 2 below.

Table 2: Implementation Effort Estimation (Release of Information)

Time Estimates	**Effort Estimates**	**Lapse time**
1) Requirement Scoping and Analysis	3.4 man-weeks	4.5 calendar-weeks
2) System (including MCE) Development/ Testing/ Deployment/ Documentation	18 man-weeks	25.2 calendar-weeks
3) User Acceptance Testing and support	1.5 man-weeks	2.25 calendar-weeks
Total Time Required	**23 man-weeks**	**32 calendar-weeks**
Cost Estimates		
1) Power Systems Consultant Resource	Within EMC's budget (1.7 man-weeks)	
2) EMC Manpower	$25,314	
3) Vendor efforts	$60,900	
Total Additional Cost Required	**$86,214**	

The estimated time and cost to conduct the simulation study (as described under section 3.2.2) is shown in Table 3 below.

Table 3: Implementation Effort Estimation (Simulation Study)

Implementation Cost/Time	
Time Estimates	**Effort Estimates**
1) Requirement Scoping and Analysis	6.2 man-weeks
2) System (including MCE) Development/ Testing/ Deployment/ Documentation	36.8 man-weeks
3) User Acceptance Testing and support	3 man-weeks
Total Time Required	**46 man-weeks**

[14] EMC may consult PSO and Transmission Licensee to identify which transmission equipment could have caused the congestion and the most likely connection of such transmission equipment if it is in service.

[15] Original run refers to the MCE schedules produced in the real-time dispatch schedule or, where price revision is conducted, the MCE schedules produced in the price re-run.

Cost Estimates		
1) Power Systems Consultant Resource/ EMC Manpower	Within EMC's budget (6 man-weeks)	
2) EMC Manpower	$60,950	
3) Vendor efforts	$97,120	
Total Additional Cost Required	**$158,070**	
On-going Operational Cost		
Operational cost On-going operation cost based on simulation run per trading period	**$690**	
Breakdown of Activities	**Number of Hours**	
	Preparer	**Authoriser**
Rerun preparation	1	
Rerun results analysis	2	2
Documentation	6	
Total	**9**	**2**

5. Consultation

EMC published the paper to seek market participants' views on the following:

1) With regard to the information proposed to be released under section 3.2.1 of the paper, is such information useful for MPs to analyse the risks associated with transmission constraints and if so what are the benefits they can derive from such information?

   No MP has indicated that the release of such information would be useful. There is also concern that "given the inherent concentrated market the information proposed to be released could serve more harm than benefit to the market, as it may courage the exercise of market power".

2) Is there any other information that MPs may find useful or important to be released and the benefits that can be derived?

   With regard to information on security constraints, PSO commented that there is an existing process for PSO to inform the affected market participants of the situation when there is a need to apply security constraint. It is not necessary to release more information to ALL market participants.

   With regard to information on transmission line constraints, Keppel Merlimau Cogen commented that a diagram showing the transmission line that are binding or having congestion might be useful and will allow MPs to understand the grid better.

3) EMC consulted the PSO and the Transmission Licensee on whether the simulation study results (as described in section 3.2.2 of the paper) would be useful in the grid planning and application of security constraint process.

Both the transmission licensee and the PSO are of the view that the simulation study would not be useful, due to following reasons

- Such study is not required in the grid planning process stipulated in the transmission code.

- The simulation results may not necessarily reflect the real supply condition as Gencos could change offer prices when congestion occurs.

- It could be misleading to use dynamic inputs such as pool prices for long term transmission planning.

Please refer to Annex 2 for the comments received from the industry.

6. Conclusion and Recommendation

This paper assessed the proposal to provide more transparency on transmission constraints so as to allow the stakeholder in the industry to better understand and manage transmission constraints.

Compared with other electricity markets, the information on transmission constraints released in SWEM is relatively low and EMC has then proposed more information, such as the forecast of transmission constraints and quantitative analysis of price separation events, to be released to the market.

After consultation with the industry, we could not establish that the information proposed to be released under section 3 would bring additional benefit to the market participants. Therefore we recommend that the Rules Change Panel **do not support** the proposal.

7. Deliberation at the 78th RCP meeting

At its 78th meeting, the Rules Change Panel by majority vote decided **not to support** both the proposed release of information (in section 3.2.1) and the proposed simulation study (in section 3.2.2).

The details of the votes are as follows:

Proposed Release of Information (in section 3.2.1)

Those who voted to support the proposed release of information:
1) Mr. Daniel Lee (Representative of Retail Electricity Licensee)
2) Mr. Luke Peacocke (Representative of Retail Electricity Licensee)

Those who voted not to support the proposed release of information:
1) Mr. Soh Yap Choon (Representative of the PSO)
2) Ms. Priscilla Chua (Representative of Generation Licensee)
3) Mr. Marcus Tan (Representative of Generation Licensee)
4) Mr. Lim Han Kwang (Representative of Transmission Licensee)
5) Mr. Sean Chan (Representative of Retail Electricity Licensee)
6) Mr. Lawrence Lee (Representative of the market support services licensees)
7) Mr. Phillip Tan (Person experienced in Financial Matters in Singapore)
8) Ms. Frances Chang Yoke Ping (Representative of Consumers of Electricity in Singapore)

Those who abstained from voting:
1) Mr. Dallon Kay (Representative of Wholesale Electricity Trader)
2) Ms. Grace Chiam (Representative of Generation Licensee)
3) Mr. Toh Seong Wah (Representative of EMC)

Proposed Simulation Study (in section 3.2.2)

Those who voted not to support the proposed simulation study:
1) Mr. Soh Yap Choon (Representative of the PSO)

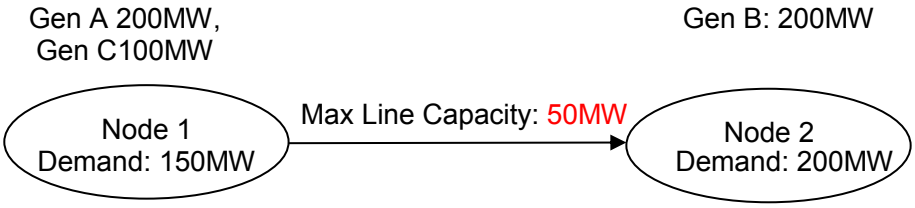
2) Ms. Priscilla Chua (Representative of Generation Licensee)
3) Mr. Marcus Tan (Representative of Generation Licensee)
4) Mr. Lim Han Kwang (Representative of Transmission Licensee)
5) Mr. Sean Chan (Representative of Retail Electricity Licensee)
6) Mr. Lawrence Lee (Representative of the market support services licensees)
7) Mr. Phillip Tan (Person experienced in Financial Matters in Singapore)
8) Ms. Frances Chang Yoke Ping (Representative of Consumers of Electricity in Singapore)
9) Mr. Daniel Lee (Representative of Retail Electricity Licensee)
10) Mr. Luke Peacocke (Representative of Retail Electricity Licensee
11) Ms. Grace Chiam (Representative of Generation Licensee)

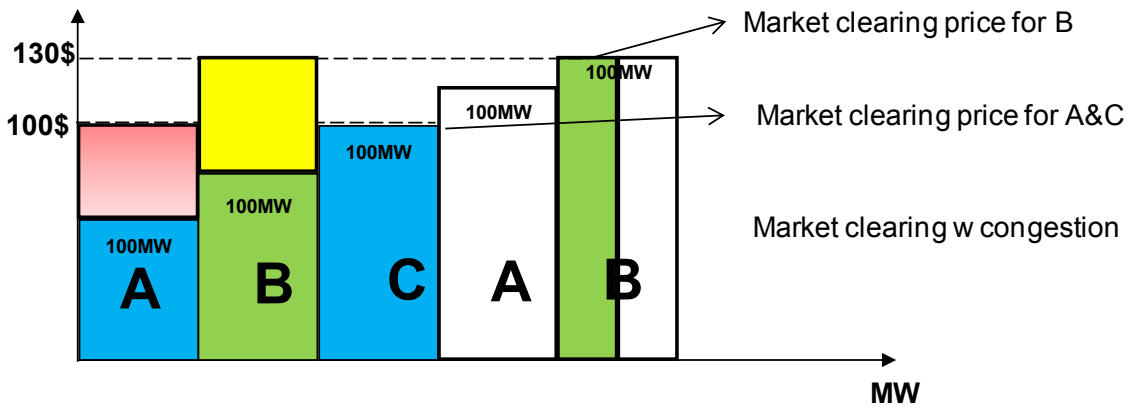
Those who abstained from voting:

1) Mr. Toh Seong Wah (Representative of EMC)
2) Mr. Dallon Kay (Representative of Wholesale Electricity Trader)

Annex 1: Increase in (UESP+HEUC) due to Transmission Constraint

In this example, the offer price (second tranche) of generator B is $130/MWh (instead of $160/MWh as in Figure 2). Consequently, the clearing price for generator B is lower, which led to a decrease in (USEP+HEUC), compared with the example in Figure 2.





Prices and Schedules when there is congestion			
	Gen A and C	**Gen B**[16]	**Consumers**
Price	$100/MWh	$130/MWh	(USEP+HEUC[17]) $112.86
Scheduled Qty	200MW	150MW	350MW

[16] Note that in this case, generator B's second offer tranche is at $130/MWh instead of $160/MWh (in Figure 2).

[17] USEP = $\sum_{(\text{all nodes})}$(nodal price x demand)/ Total Demand
= ($100 x 150MW+$130 x 200MW)/(150MW+200MW)
= $117.14;
HEUC = [$\sum_{(\text{all generators})}$(nodal price x scheduled generation) - USEP x Total Demand] / Total Demand
= [($100 x 200MW + $130x 150MW) -($117.14 x 350MW)]/ 350MW
= $-4.28

Annex 2: Industry Comments Received

Organisation	Comments Received
Transmission Licensee	The simulation study results (as described in section 3.2.2 of the paper) is not required in the grid planning process stipulated in Section 8.3 of the Transmission Code. As such, the simulation study results are not useful to the Transmission Licensee in the grid planning exercise. We agree with EMC's comments that the hypothetical counterfactual arising from such proposed simulation study may not be achievable. Therefore, there seems to be no real benefit to the industry for EMC to perform a simulation study that does not objectively reflect the market conditions.
PacificLight Power	PLP is fully supportive of increased transparency in the Singapore Wholesale Electricity Market (SWEM) through improved real time data access to market participants on the basis that (i) the release of the data does not unfairly prejudice any party/parties (ii) that the release of the data provides for a more effective and competitive market. We note that the proposal proposes to release historic data. We do not believe that release of historic data aids the market outcome as it does not allow participants to make pre-emptive decisions which would alter the economic outcome based on network congestion. We are therefore not supportive of the proposal. We also note that the intention would be to use standing offers in the Week Ahead Run for the data analysis which does not reflect real time plant data. It would therefore reduce the value of the data analysis and potentially overstate the extent of any congestion.
PSO	1) [We would like to seek market participants' views on the following: • With regard to the information proposed to be released under section 3.2.1 of the paper, we would like to seek MP's view if such information useful for MPs to analyse the risks associated with transmission constraints and if so what are the benefits they can derive from such information? • Is there any other information that MPs may find useful or important to be released and the benefits that can be derived?] PSO: Whenever there is a need to impose security constraint, PSO would engage the affected market participants and provide the background information to inform them of the situation. It is not necessary to release more information to all market participants as all

Organisation	Comments Received
	market participants would have the necessary information to continue to participate in the market. 2) [We would like to seek the views of the PSO and the Transmission Licensee on the following: • Would the simulation study results (as described in section 3.2.2 of the paper) be useful in the grid planning and application of security constraint process?] PSO: Prices are dependent on how the Gencos offer their capacity in the market which may not necessarily reflect the real supply condition. This was supported in the Jan 2015 MISF which showed that offer changes took place even during the occurrence of the security constraint. Therefore, it would be misleading to use such dynamic input like prices for long term transmission planning. For the recent security constraint incidents, transmission development plan are already in place to address these limitation.
Keppel Merlimau Cogen	• [With regard to the information proposed to be released under section 3.2.1 of the paper, we would like to seek MP's view if such information useful for MPs to analyse the risks associated with transmission constraints and if so what are the benefits they can derive from such information?] Keppel is of the view that given the inherent highly concentrated market, the information proposed to be released to all MPs will serve more harm than benefits to the electricity market. It encourages the exercise of market power with the increased in transparency of market information on transmission congestion and price separation. Unaffected MPs can exacerbate the congestion situation and widen the price separation easier with the increased market information being released. Whereas there is nothing much the affected MPs can do other than reducing their generation to ease the congestion. There is an existing process for information such as the details of the security constraint to be made known to the affected MPs prior to the implementation. Hence, Keppel does not see any benefits to the electricity market by providing **all** MPs with first-hand access to such price sensitive information. • [Is there any other information that MPs may find useful or important to be released and the benefits that can be derived?] Diagram showing the transmission lines that are binding or having outages might be useful and will allow MPs to understand the network grid better.