This paper seeks to clarify and align the various timelines in relation to provision of credit support in the market rules.

Specifically, the EMC looked into five issues and made four proposals:

1) different timelines for satisfying a margin call and meeting credit support value (CSV) requirement
   In the event that a market participant’s (MP’s) existing or remaining credit support is less than its CSV, if the MP has also been issued a margin call, then the MP shall both satisfy its margin call and meet its CSV requirement within 2 business days (BDs).

2) provision of replacement for expiring credit support
   Replacement credit support shall be provided at least 30 days or 35 days, for the market support services licensee (MSSL) and market participants (MPs) (except the MSSL) respectively, prior to the expiry date of the existing credit support.

3) non-renewal notification requirement of Standby Letter of Credit (SBLC) / Banker’s Guarantee (BG)
   Non-renewal notification by the guarantor financial institution of an SBLC or BG shall be given to the EMC 33 days or 38 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the SBLC or BG.

4) provision of replacement for invalid credit support
   In the event that any part of the credit support provided by an MP ceases to be current or valid for any reason:
     a) if the MP (except the MSSL) so notifies the EMC more than 35 days prior to the expiry, it shall be required to provide replacement credit support 35 days prior to the expiry,
otherwise the MP is required to provide replacement credit support immediately within 2 BDs; and

b) if the MSSL so notifies the EMC more than 30 days prior to the expiry, it shall be required to provide replacement credit support 30 days prior to the expiry, otherwise the MSSL is required to provide replacement credit support immediately within 2 BDs.

The following issue was also reviewed by the EMC. Our assessment is that status quo is satisfactory, hence no change is proposed.

5) whether a minimum term of validity should be applied for BGs as a form of credit support

At the 112th RCP meeting, the RCP:

(i) **by majority vote supported** Proposal 1;

(ii) **unanimously supported** Proposals 2 to 4; and

(iii) **tasked** the EMC to draft the relevant rule modifications.
1. **Introduction**

This paper clarifies and aligns the various timelines in relation to provision of credit support in the market rules and proposes changes to the current rules.

2. **Background**

2.1 **Current Prudential Requirements in the SWEM**

Prudential requirements set out in the current market rules stipulate that every market participant (MP), including a market support services licensee (MSSL), that intends to participate in the Singapore Wholesale Electricity Market (SWEM) needs to provide and maintain credit support with the EMC that is no lesser than its credit support value (CSV). The CSV is computed as follows:

\[
\text{Credit Support Value} = \text{Estimated Average Daily Exposure (ADE)} \times 30 \text{ calendar days} \quad 1
\]

Where Estimated ADE = -1 * average of net settlement amounts set out on the 90 most recently available Preliminary Settlement Statement (PSS) or corresponding Final Settlement Statement (FSS) (if available)\(^2\).

As per the formula above, credit support would be required from all net debtor MPs. For the avoidance of doubt, all references to an MP in this paper shall include a reference to an MSSL, unless otherwise expressly stated.

2.2 **Forms of Credit Support**

The market rules allow credit support provided by an MP to be in the form of:

- a Banker’s Guarantee (BG) or Standby Letter of Credit (SBLC) by a financial institution that is (i) a local bank, or (ii) a foreign bank licensed to carry on banking business in Singapore and acting through its office in Singapore, rated “A” or better by Standard & Poor’s,
- cash deposits made with the EMC,
- Singapore Government Treasury bills\(^3\), or a combination of the above.

2.3 **Risk Exposure Monitoring and Margin Call**

On each business day (BD), the EMC assesses the adequacy of credit support held in respect of each MP by calculating their respective Risk Exposure (RE), which is:

\[
\text{Risk Exposure (RE)} = \frac{\text{Estimated Net Exposure}}{\text{Credit Support Held}} = \frac{\text{Current Exposure} + (20 - X) \times \text{Estimated ADE} - \text{Prepayment Amount}}{\text{Credit Support Held}}
\]

where:

\(^1\) Rules modifications in relation to RC 359 (Review of Credit Support Requirements in Alignment with the Lead Time for Transfers During a Retailer of Last Resort Event) will take effect from 8 January 2020. Unless otherwise stated, analysis in this paper is based on current market rules.

\(^2\) For MPs with no more than 90 days of trading in the SWEM, their Estimated ADEs are calculated by averaged prices multiplied by forecast or actual quantities, whichever is greater.

\(^3\) Such Treasury bills shall be valued as cash at their current market value less 2%. No MP has provided or intended to provide credit support in the form of Treasury bills in the SWEM till present.
- Current Exposure = -1 × aggregate of net settlement amounts set out on all of the MP’s PSSs (or corresponding FSSs if available) for all trading days where the invoices for such settlement statements would not yet be due for payment on that given day; and
- \( X \) refers to the number of trading days to which the Current Exposure relates.

As metering data is only available to the EMC 5 BDs after a trading day, the EMC determines the net settlement amount for a given trading day only 6 BDs after that trading day. The Risk Exposure calculation thus uses Estimated ADE to approximate the exposure for the period during which an MP’s actual exposure is unknown (i.e. exposure incurred from trading day \( D - 5 BD \) to \( D \) as shown in Figure 1 below).

![Figure 1: Risk Exposure Monitoring](image)

The EMC notifies an MP when the MP’s RE reaches 60% and issues a margin call when the RE reaches or exceeds 70%. The MP must satisfy a margin call within 2 BDs via providing additional credit support or making pre-payment to the EMC such that the MP’s RE is brought down to 50% or less.4

3. Description of Issues and Proposals

In this section, we examine five associated issues that have been raised in relation to this proposal.

3.1 Different Timelines for Satisfying a Margin Call and Meeting the CSV Requirement

If the EMC has revised the CSV requirement or claimed any credit support of an MP, resulting in the existing or remaining credit support becoming less than the MP’s CSV requirement, then the MP needs to provide additional credit support within 5 BDs to bring its credit support to at least the CSV requirement. The same event may trigger a margin call as well and the MP is required to satisfy the margin call within 2 BDs. Table 1 below provides a numerical illustration of how the MP could satisfy the margin call and meet its CSV requirement respectively.

<table>
<thead>
<tr>
<th>Margin call and insufficient credit support</th>
<th>To satisfy margin call</th>
<th>To meet CSV requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Current Exposure</td>
<td>$1,200,000</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Estimated ADE</td>
<td>$115,000</td>
<td>$115,000</td>
</tr>
<tr>
<td>((20 - X)^*)Estimated ADE</td>
<td>$920,000</td>
<td>$920,000</td>
</tr>
</tbody>
</table>

4 Rules modifications in relation to RC 359 (Review of Credit Support Requirements in Alignment with the Lead Time for Transfers During a Retailer of Last Resort Event) will take effect from 8 January 2020. Unless otherwise stated, analysis in this paper is based on current market rules.
For the sole purpose of satisfying a margin call, providing additional credit support can be twice as costly as making prepayment. As shown in Table 1, in order to bring its RE to 50%, the MP is required to either a) make prepayment of $620,000 or b) provide additional credit support of $1,240,000. Although making prepayment creates additional administrative work and settlement checks for both the MP and the EMC, it is sometimes preferred by MPs with tight cash flows to meet their immediate obligations in satisfying margin calls.

The MP in the example given in Table 1 above has two rule obligations with different timelines: satisfying the margin call within 2 BDs and meeting its CSV requirement within 5 BDs. We set out three different approaches that the MP may take in Table 2 below.

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Numerical Illustration in Table 1</th>
<th>Difficulty of Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) provide additional credit support within 2 BDs to both satisfy margin call and meet CSV requirement</td>
<td>Minimum $1,240,000 of additional credit support provided in 2 BDs</td>
<td>Most cash outlay(^5) with tight timeline</td>
</tr>
<tr>
<td>(ii) make prepayment to satisfy margin call first (within 2 BDs) and provide additional credit support later (within 5 BDs)</td>
<td>Minimum $620,000 of prepayment provided in 2 BDs Minimum $450,000 of additional credit support provided in 5 BDs</td>
<td>Less cash outlay with slightly more extended timeline</td>
</tr>
<tr>
<td>(iii) provide a combination of additional credit support and prepayment to meet CSV requirements and satisfy margin call concurrently within 2 BDs</td>
<td>Minimum $450,000 of additional credit support provided in 2 BDs Minimum $395,000 of prepayment provided in 2BDs</td>
<td>Least cash outlay with tight timeline</td>
</tr>
</tbody>
</table>

With either Approach (i) or (iii), the potential credit risk due to insufficient credit support of the MP could be remedied within 2 BDs when the MP meets its CSV requirement. Although MPs are encouraged to provide a reasonable buffer on top of their CSV requirements, Approach (i) entails more cash outlay from the MP and the credit support held of the MP could become unnecessarily excessive compared to its CSV requirement. Approach (iii) provides certain flexibility to the MP to choose an optimal combination of additional credit support and prepayment amount.

Approach (ii) could be preferred by MPs with critical cash flow issues since the immediate cash top-up within 2 BDs is the least. Note that the prepayment amount is more than that in Approach (iii) as the credit support amount (prior to the MP meeting its CSV requirement) used for RE calculation is smaller. However, while the MP has satisfied its margin call by making prepayment, its credit support remains less than its CSV requirement for another 3 BDs before the shortfall is remedied. We examined the potential credit risk exposure to the market during the 3 BDs as a result of Approach (ii). As shown in Table 3 below, during the 3 BDs, risks associated with the

\(^5\) Assuming both credit support top-up and prepayment are done using cash deposit
credit support shortfall of $10,000 are not fully met by the prepayment amount of $4,000. There is still uncovered credit risk of $6,000 to the market.

Table 3: Credit Risk Analysis of Approach (ii)

<table>
<thead>
<tr>
<th>Margin call and insufficient credit support</th>
<th>Approach (ii)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1 - to satisfy margin call by making prepayment in 2 BDs</td>
</tr>
<tr>
<td>X</td>
<td>12</td>
</tr>
<tr>
<td>Current Exposure</td>
<td>$6,000</td>
</tr>
<tr>
<td>Estimated ADE</td>
<td>$1,000</td>
</tr>
<tr>
<td>(20-X)*Estimated ADE</td>
<td>$8,000</td>
</tr>
<tr>
<td>Prepayment Amount</td>
<td>-</td>
</tr>
<tr>
<td>ENE</td>
<td>$14,000</td>
</tr>
<tr>
<td>Credit Support Held</td>
<td>$20,000</td>
</tr>
<tr>
<td>RE</td>
<td>70.00%</td>
</tr>
<tr>
<td>CSV = 30* Estimated ADE</td>
<td>$30,000</td>
</tr>
<tr>
<td>Credit Support Shorfall = CSV – Credit Support Held</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

To avoid possible confusion of timelines and the potentially uncovered credit risk associated with Approach (ii), in the event an MP that has insufficient credit support also receives a margin call from the EMC, the MP should both satisfy its margin call and meet its CSV requirement within 2 BDs.

To complete the review of this issue, one should note that it is possible that an MP is assessed to have insufficient credit support compared to its CSV requirement, but no margin call is issued as its RE stays below 70%. Given the formula of RE, this is typically associated with the situation where the MP’s recent daily exposure is much less than its Estimated ADE. The status quo requirement of meeting the CSV requirement within 5 BDs is still acceptable given that the MP’s RE is considered reasonably healthy (below 70%). In addition, the timeline of 5 BDs serves to provide the MP with more flexibility in terms of the forms of credit support it can obtain, especially if the MP’s intention is to provide additional credit support in the form of an SBLC or a BG.

Proposal 1

In the event that an MP’s existing or remaining credit support is less than its CSV, if the MP has also been issued a margin call, then the MP shall both satisfy its margin call and meet its CSV requirement within 2 BDs. Figure 2 below illustrates the outcome of this proposal 1.
3.2 Provision of Replacement for Expiring Credit Support

If an expiring credit support would bring an MP’s credit support below its CSV requirement, the MP is required to provide a replacement credit support at least 10 BDs prior to the expiry date of its existing credit support. Failure to do so would constitute an event of default under the market rules.

However, if an MP fails to provide replacement credit support in time and starts to default on its payments, its total trading exposure is about 35 days which includes 20 days (subject to BD convention) of payment cycle, up to 4 BDs of suspension process, and 3 BDs of Retailer of Last Resort (RoLR) process if the MP is not the MSSL. The EMC is only able to claim the MP’s credit support in respect of its due and unpaid invoices up to the expiry date of its existing credit support.

As illustrated in Figure 3 below, if an MP (except the MSSL) starts to default on its payment 10 BDs before the BG expiry date, out of its total trading exposure which is about 35 days, the EMC can only recover about 15 days (10BDs) of due and unpaid invoice amount of the MP by the expiry date of its credit support. The MP’s invoices that are due and unpaid after the expiry date of the credit support leave uncovered risks to the market.

![Figure 3: Uncovered Exposure Due to Expiring Credit Support](image)

Proposal 2

In order to cover an MP’s total trading exposure in the event of its non-provision of replacement credit support and default on payment, the EMC proposes that the replacement credit support to be provided at least 30 days or 35 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the existing credit support. Figure 4 below illustrates the outcome of this proposal 1 for the case of MPs (except the MSSL).

The proposal is unlikely to have material financial impact on MPs. If the replacement credit support is in the form of BG, the replacement BG is typically effective from the day after the expiry date of the existing credit support; if the MP intends to provide cash deposit to replace the expiring BG, this would require the cash deposit to be transferred to EMC 30 or 35 days in advance.

![Figure 4: Illustration of Proposal 2 (MPs except the MSSL)](image)
3.3 Non-renewal Notification Requirement of SBLC/BG

If an SBLC or BG allows for auto renewal, the guarantor financial institution is required to give written notice to the EMC about its intention not to renew at least 30 days prior to the expiry date of the SBLC or BG. The 30-day timeline covers the existing CSV requirement which is 30 days of Estimated ADE.

In the modified CSV requirements in RC 359 (Review of Credit Support Requirements in Alignment with the Lead Time for Transfers During a Retailer of Last Resort Event) which will come into effect on 8 January 2020, the MSSL are required to provide credit support equivalent to 33 days of Estimated ADE and all MPs (except the MSSL) are required to provide credit support equivalent to 38 days of Estimated ADE. The notification timeline needs to be updated accordingly to provide sufficient coverage of trading exposure of MPs.

Proposal 3

In alignment with the modified CSV requirements, the EMC proposes that the non-renewal notification by the guarantor financial institution of an SBLC or BG to be given to the EMC 33 days or 38 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the SBLC or BG.

3.4 Provision of Replacement for Invalid Credit Support

If any part of the credit support provided by the MP ceases to be current or valid for any reason, the MP is currently required by the market rules to immediately notify the EMC and provide to the EMC a replacement credit support to at least meet its CSV requirement within 2 BDs of the date on which the existing credit support ceases to be current or valid (“expiry date”).

The uncovered trading exposure of the MP differs depending on when the MP becomes aware of such situation and notifies the EMC (“notification date”), relative to the expiry date of the credit support. Different lead time between the notification date and the expiry date should warrant different treatments.

Proposal 4

Figure 5 below illustrates the intention of proposal 4.

Figure 5: Illustration of Proposal 4

- For MPs (except the MSSL), if the notification date is more than 35 days prior to the expiry date, there is no uncovered trading exposure as illustrated by Figure 5 above. In this case, it is not an immediate requirement for the MP to provide replacement credit support, as long as the MP does so 35 days prior to the expiry date of the credit support.

- For MPs (except the MSSL), if the notification date falls within 35 days to the expiry date or after the expiry date, there will be uncovered trading exposure if the MP does not provide replacement credit support immediately. The MP shall be required to meet its CSV requirement within 2 BDs.

- For the MSSL, the corresponding cut-off time is 30 days. The MSSL is only required to provide replacement credit support 30 days prior to the expiry date of its credit support if the notification date is more than 30 days prior to the expiry date while it should top up its credit...
support immediately **within 2 BDs** with the EMC if the notification date falls within 30 days to the expiry date or after the expiry date.

### 3.5 Minimum Term of Validity for BG

The current market rules stipulate that credit support in the form of an SBLC shall be valid for at least a year or provide for auto renewal while there is no such requirement for credit support in the form of a BG. It is proposed that the same requirement to be applied for credit support in the form of a BG.

The proposal could potentially increase the banking cost of MPs if a one-year term of validity is deemed not necessary for the MP's individual credit profile. In the past two years, we have observed an upward trend of MPs providing BGs with shorter term of validity. In 2018, 10% of the BGs received by the EMC have terms of validity that are less than one year; in the first 9 months of 2019, the figure has gone up to 32%.

Taking a snapshot at mid of September 2019:

- 6 MPs (including the MSSL) provided BGs with validity of less than one year and the face value of those BGs made up a rather significant proportion of the MP/MSSL's respective total amount of credit support;
- out of the 33 BGs provided by MPs (except the MSSL), 10 (30%) of them have terms of validity that are less than one year; and
- the total face value of all BGs provided by MPs (except the MSSL) is about $280 million and BGs with validity of less than one year made up 22% of that total face value.

While the proposal of having a minimum term of validity of one year for BGs would require less frequent monitoring of expiry of BGs and improve operational efficiency from the EMC’s point of view, we understand that there might be certain commercial considerations which make BGs of shorter term of validity more favourable than those of longer term of validity, or the alternative of providing credit support in the form of cash deposits. Status quo grants MPs with a reasonable level of flexibility in choosing their preferred form of credit support and we do not propose any changes to it.

### 4. Summary of Proposals and Conclusion

This paper has reviewed the various timelines in relation to provision of credit support and proposed the following changes to the current market rules:

1) In the event that an MP’s existing or remaining credit support is less than its CSV, if the MP has also been issued a margin call, then the MP shall both satisfy its margin call and meet its CSV requirement within 2 BDs.

2) Replacement credit support shall be provided at least 30 days or 35 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the existing credit support.

3) Non-renewal notification by the guarantor financial institution of an SBLC or BG shall be given to the EMC 33 days or 38 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the SBLC or BG.

4) In the event that any part of the credit support provided by an MP ceases to be current or valid for any reason:
   a) if the MP (except the MSSL) so notifies the EMC more than 35 days prior to the expiry, it shall be required to provide replacement credit support 35 days prior to the expiry, otherwise the MP is required to provide replacement credit support immediately within 2 BDs; and
b) if the MSSL so notifies the EMC more than 30 days prior to the expiry, it shall be required to provide replacement credit support 30 days prior to the expiry, otherwise the MSSL is required to provide replacement credit support immediately within 2 BDs.

5. Consultation

The concept paper was published for consultation on 11 October 2019 and a comment was received from Markets and Operations of the EMC.

Comments from Markets and Operations of the EMC

Out of the five issues raised, Issue 2 and 4 has a timeline to provide credit support at least 30 or 35 days for the replacement of the existing credit support. Whereas non-renewal notification by the guarantor financial institution of an SBLC/BG shall be provided 33 or 38 days for MSSL and MP. As there are potentially long weekends due to public holidays, the timeline to provide credit support as well as the non-renewal notification of the auto-renewal BG may fall on the same day.

EMC’s response

In the event that the guarantor financial institution of an SBLC/BG gives written notice to the EMC about its intention not to renew at least 38 days (or 33 days for the case of the MSSL) prior to the expiry date of the SBLC/BG of an MP, the EMC will consider notifying the MP accordingly and require the MP to provide replacement credit support within 2 BDs. For clarity, the timeline to provide replacement credit support at least 30 or 35 days, for the MSSL and MPs (except the MSSL) respectively, prior to the expiry date of the existing credit support is not applicable in this case.

6. Implementation Time and Cost

Table 4 summarises the implementation time and cost estimates.

<table>
<thead>
<tr>
<th>Time Estimates</th>
<th>Man week(s)</th>
<th>Elapse Time Calendar week(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0. Vendor Selection/Preparation</td>
<td>N.A.</td>
<td>8</td>
</tr>
<tr>
<td>1. Change Requirement Scoping and Analysis</td>
<td>8.0</td>
<td>3</td>
</tr>
<tr>
<td>2. System Development/Testing/Project Management</td>
<td>30.2</td>
<td>9</td>
</tr>
<tr>
<td>3. User Acceptance Testing (UAT)</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>4. Audit</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>Total Effort Required</strong></td>
<td>41.2</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Internal EMC Manpower</td>
<td>$27,808</td>
</tr>
<tr>
<td>2. External resource to support (Vendor)</td>
<td>$62,918</td>
</tr>
<tr>
<td>3. Audit</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

7. Decisions at the 112th RCP Meeting

The concept paper was presented at the 112th RCP meeting held on 12 November 2019. The RCP:

(iv) by majority vote supported Proposal 1;
(v) unanimously supported Proposals 2 to 4; and
(vi) tasked the EMC to draft the relevant rule modifications.
Details of the voting outcome of Proposal 1 are listed below.

The following RCP members supported Proposal 1:

- Mr. Teo Chin Hau (Representative of Generation Licensee)
- Mr. Tony Tan (Representative of Generation Licensee)
- Mr. Mark New (Representative of Retail Electricity Licensee)
- Ms. Ho Yin Shan (Representative of the Market Support Services Licensee)
- Mr. YK Fong (Representative of Consumers of Electricity in Singapore)
- Mr. Tan Chian Khong (Person experienced in Financial Matters in Singapore)
- Ms. Carol Tan (Representative of Transmission Licensee)
- Mr. Henry Gan (Representative of EMC)
- Mr. Matthew Yeo (Representative of Wholesale Electricity Trader)

The following RCP members abstained from voting:

- Mr. Marcus Tan (Representative of Generation Licensee)
- Mr. Soh Yap Choon (Representative of the PSO)
- Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)