Response to comments on RC335: Proposed Rules Modification for EMA's "Implementing Demand Response in the National Electricity Market of Singapore"

Submitted by	Reference	Comments	EMC's Response
EMC, Market Operations	-	Under certain circumstances, CUSEP could be lower than USEP due to co-optimization, which leads to LCP being floored at $0/MWh. For example during the counterfactual run with a higher demand, a more expensive GRF can be constrained on in order to clear its cheaper regulation offer. As the constrained-on GRF's offers cannot set the energy price, this may result in cheaper energy prices compared to the real-time dispatch schedule.	Noted. This is similar to a situation where a generator which is constrained on due to co-optimisation would receive a lower MEP. Flooring LCP at $0/MWh when CUSEP is lower than USEP is to prevent LRFs with REB from paying EMC instead of receiving incentive payments.
EMC, Market Operations	-	According to SOM, the load forecast provided by PSO effectively is generation forecast which comprises the consumption from all loads. With the demand response bidding, MCE needs to deduct restricted energy bids quantity from the load forecast provided by PSO in order to derive the non-dispatchable load. EMC will be updating "Methodology for Determination of Load Participation Factors" as required by Market Rules: Chapter 6, Section 7.2.2 to reflect this treatment as well.	The "Methodology for Determination of Load Participation Factors" should be updated. This would come into effect at the same time as the proposed rules modification for implementing Demand Response. EMC Market Operations can proceed to brief the industry on the changes.
DNV GL and NTU	Appendix 6D section D.9A.3.1	In the revised section D.9A.3.1 (of Appendix 6D), it is stated that the quantity of the energy bid created by EMC is the load forecast. Our understanding is that this quantity should be: Nodal Load Forecast – sum of all bidden quantities associated with the node.	The nodal load forecast referred to in section D.9A.3.1 of Appendix 6D is the non-dispatchable load forecast provided by PSO under Appendix 6G section G.2.1. This quantity already excludes the bidden quantities submitted by load facilities participating in demand response.
DNV GL and NTU	Appendix 6D sections D.12 and D.19.3	In the revised sections **D.19.3** (of Appendix 6D) and **D.12** (of Appendix 6D), the ramp-up and ramp-down rates are used to constrain the **Purchase$_p$**. The **Purchase$_p$** is the scheduled amount of the bidden quantities rather than the total energy consumption of the load provider. Consequently, imposing ramp rates on the **Purchase$_p$** alone is NOT reasonable, and it will NOT guarantee that the total energy consumption will be within the achievable level.	The example given is a hypothetical one, where the low ramp rates, coupled with high load curtailment capacity, resulted in the ramp rates being binding. If the problem arises in practice, we will look into the issue.

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		We use a simplified example to illustrate our point, as follows. In the immediately preceding period, one energy bid and its dispatch schedule are assumed to be: 	Period (30min)	Total Load (MW)	Ramp up (MW/min)	Ramp down (MW/min)	Price #1 ($/MWh)	Quantity #1 (MW)
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P-1	100	1	1	500	30 | In current period, the energy bid is assumed to be: | Period (30min)	Total Load (MW)	Ramp up (MW/min)	Ramp down (MW/min)	Price #1 ($/MWh)	Quantity #1 (MW)
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P	100	1	1	500	70	 For simplicity purposes, we assume that the Total Loads specified in both offers are accurate. • During period P-1, the energy withdrawal level is 100 since no curtailment occurs. • Thus, the achievable energy withdrawal level in Period P should be within $[100-1\times30, 100+1\times30]$, i.e., [70,130]. • However, as per D.19.3 and D.12, we have $(30-1\times30) \leq \text{Purchase}_P \leq (30+1\times30)$, i.e., $0 \leq \text{Purchase}_p \leq 60$. • Consequently, the energy withdrawal level will fall within [100-70+0, 100-70+60], i.e., [30,90]. It seems imposing ramp up and down rates on dispatchable load only may lead to unreasonable result.	
PSO	Chapter 5 section	PSO has to maintain system security, which should not constrained by valid offers. The affected Market Participants may request for	PSO's proposed amendment does not pertain specifically to the Demand Response Scheme.

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	9.1.2.2	compensation claims under the applicable Market Rules. Our proposed amendments as follow: **Chapter 5** 9.1.2.2 where a *real-time dispatch schedule* is not released by the *EMC* pursuant to section 9.2.3 of Chapter 6 to a *dispatch coordinator* for a given *registered facility* and *dispatch period*, the *PSO* shall issue *dispatch instructions* to that *dispatch coordinator* for that *dispatch period*, instructing the applicable *registered facility* ~~with a valid *energy* offer, *reserve* offer, or *regulation* offer or *energy bid*~~ to provide or, to limit the provision of, to withdraw or to limit the withdrawal of the relevant *physical service* at or to the level specified in the *dispatch instruction*; and 9.1.3 Where the *PSO* considers that any *dispatch instructions* issued in accordance with section 9.1.2 could result in the *PSO controlled system* entering into a *high-risk operating state* or an *emergency operating state*, the *PSO* may issue *dispatch instructions* to a *dispatch co-ordinator* for a *dispatch period* at any time between the release of the *real-time dispatch schedule* to the *dispatch co-ordinator* for that *dispatch period* and the end of that *dispatch period*, instructing any *registered facility* ~~with a valid *energy offer, reserve offer* or, *regulation offer* or *energy bid*~~ to provide or, to limit the provision of, to withdraw or to limit the withdrawal of the relevant *physical service* at or to the level specified in the *dispatch instruction*. Any such *dispatch instructions* shall override any prior *dispatch instructions*.	We have included this issue in the 2016/17 Rules Change Work Plan Prioritisation Exercise.
PSO	Chapter 5 section 9.3.6	The insertion that requires PSO to issue load restoration notice within 1 business day is not acceptable and should be removed. Load registered facilities are only activated to provide reserve during a contingency event, PSO cannot issue restoration notice until the power system is stabilised else it would result in further deterioration and could even cause wide-spread blackout and in the worst case – power	EMC uses the load restoration notice to determine whether a LRF with REB is exempted from being penalised for non-compliance with its dispatch instruction. If the PSO is unable to issue a load restoration

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		system collapse. **<u>Chapter 5</u>** 9.3.6 Notwithstanding anything to the contrary in section A.2 of Appendix 5A, if a *load registered facility* that is issued a *dispatch instruction* for *reserve* decreases *energy* withdrawal pursuant to the *market rules*, the *market manuals* or the *system operation manual*, its *load* shall not be restored until and unless directed or permitted by the *PSO* <u>via a load restoration notice.</u> ~~Such load restoration notice shall be issued by the *PSO* no later than one *business day* after the *trading day* on which such *dispatch instruction* was issued.~~	notice prior to the calculation of the preliminary financial penalty statement (by the end of T+5BD), EMC would issue a preliminary financial penalty statement to the MP for the LRF with REB. The MP could then raise a notice of error. If the PSO, prior to the calculation of the final financial penalty statement (by the end of T+9BD), is still unable to issue a load restoration notice, EMC will issue a final financial penalty statement to the MP. The MP could then raise a notice of arbitration if it disagrees. We will accept the PSO's amendment, and make the corresponding changes to the market manual.

Summary of Changes to Proposed Rule Modifications (compared to the version which was published for Industry Consultation)

No.	Section	Changes made	Reason for Changes
1	Market Rules Chapter 5 section 9.3.6 and Market Operations Market Manual (Automatic Financial Penalty Scheme)	Delete "Such load restoration notice shall be issued by the PSO no later than one business day after the trading day on which such dispatch instruction was issued".	PSO has pointed out that they cannot issue the load restoration notice until the power system is stabilised. Hence, no timeline should be stipulated.
2	Market Rules Appendix 6L section L.2.2(b)	Add "except where $DownRampRate_{p,h} = 0$, then $OIEC_{p,h} = (1/2 \times EndPeriodLoad_{p,h})$".	To cater for the case where DownRampRate or UpRampRate is zero, as the second term in the formulae would be undefined.
3	Market Rules Appendix 6L section L.2.2(c)	Add "except where $UpRampRate_{p,h} = 0$, then $OIEC_{p,h} = (1/2 \times EndPeriodLoad_{p,h})$".	
4	Market Rules Appendix 6L section L.2.3(b)	Add "except where $DownRampRate_{p,h} = 0$, then $SIEC_{p,h} = (1/2 \times ReferenceEnergyWithdrawal_{p,h})$".	
5	Market Rules Appendix 6L section L.2.3(c)	Add "except where $UpRampRate_{p,h} = 0$, then $SIEC_{p,h} = (1/2 \times ReferenceEnergyWithdrawal_{p,h})$".	
6	Market Rules Chapter 7 section 2.8.1	Add "Explanatory Note: It should be noted that section 2.8.1.1 and section 2.8.1.2 are disjunctive. This means that a non-curtailment event could be deemed to have occurred in respect of an LRF with REB for a given dispatch period if either section 2.8.1.1 or section 2.8.1.2 is satisfied. In other words, even if an LRF with REB is not deemed to be a deviating load registered facility for the purposes of section 2.8.1.1, a non-curtailment event can still be deemed to have occurred in respect of that LRF with REB if such LRF with REB satisfies the criteria set out in section 2.8.1.2."	To make clear that a load non-curtailment event could also apply to LRFs with REB which are exempted under sections 3.6.3.1 to 3.6.3.3 of Chapter 5.