



AUTOMATIC PENALTY SCHEME IN MARKET RULES

EMA'S DECISION

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1 Background

- 1.1 On 5 Jul 2010, EMA published its assessment and decision on “Review of Policy on Direct Supply of Electricity by Generating Sets to Onsite Loads”, setting out its decisions to grant net treatment on non-reserve charges to all embedded generators regardless of whether they export electricity to the power grid; to require embedded generators to bid into the market only for the ‘export’ quantities and to implement an Automatic Penalty Scheme (APS) for all Generation Registered Facilities (GRFs) that deviate from their dispatch schedule.

2 Automatic Penalty Scheme

- 2.1 Under the current market rules, the Market Surveillance and Compliance Panel (MSCP) would assess and may impose penalties on unscheduled generation on a case-by-case basis. The APS is to provide for a penalty to be automatically imposed whenever a GRF deviates from their dispatch schedule and the MSCP need not conduct investigations into such straightforward cases.
- 2.2 Under the APS, the penalty amount would be commensurate with the extent of deviation from the dispatch schedule. For example, a GRF operating at 300MW that trips (i.e. technically it deviated by 300MW from the dispatch schedule) would have much more impact on the power system compared to one that deviates by only 10MW, and hence would attract much higher penalty. Only those GRFs complying with PSO instructions to deviate from their dispatch schedule will be exempted from the penalty.

3 Additional Feedback Received

- 3.1 Following the publishing of EMA’s 5 Jul 2010 paper, EMA has received further feedback from some of the generation companies (gencos) that the APS should not apply when a deviation from dispatch schedule arises under circumstances that are beyond their control, such as when a generating unit

trips due to reasons beyond the control of the gencos. Based on past records, there were on average about 100 incidents of generating units tripping in a year.

- 3.2 In addition, the gencos commented that generating units should be exempted from the APS when they are being started up or shut down, when they are undergoing commissioning, and when they are being hot-switched to an alternate fuel. Under these circumstances, deviations from schedule are not entirely avoidable, and hence the gencos felt that they should not be penalised.

4 EMA's Assessment and Decision

- 4.1 After careful consideration of the gencos' representations, EMA agrees that it is reasonable to fine-tune the APS such that the scheme will not apply when the deviation from scheduled dispatch occurs under circumstances beyond the control of the genco, specifically when a GRF:

- a) has a forced outage;
- b) is being started up or shut down;
- c) is undergoing commissioning, i.e. being a commissioning generation facility; or
- d) is performing fuel changeover as required under the Transmission Code.

- 4.2 Such circumstances that have been exempted from the APS may still be subject to investigations by the MSCP which would then decide if any penalties should be imposed. For example, if a GRF were to trip too frequently, the MSCP would have the right to take appropriate action against the relevant genco notwithstanding that such GRF is exempted from the APS. The MSCP could also consider increasing the penalty amount on those who repeatedly deviated from dispatch schedule.

- 4.3 The Energy Market Company (EMC) will impose the penalty on the defaulting GRF and return the penalty collected to the market through the MEUC. The

original formula for calculating the penalty value if the GRF deviates by more than 10MW from its dispatch schedule is as follows:

$$\text{Penalty Value} = \text{Max} \{ [2 \times (\text{USEP} + \text{HEUC}) \times (| \frac{1}{2} \times (\text{BeginGeneration} + \text{EndGeneration}) \times \text{DispatchPeriod} - \text{MeteredGrossGeneration} | - \text{Tolerance})], \$5,000 \}$$

Where:

DispatchPeriod – The thirty-minute time interval beginning on the hour or the half-hour, i.e. has a value of ½ Hr.

BeginGeneration – Generation Facility's total generation output (in MW) at the start of the dispatch period as recorded by PSO's EMS system.

EndGeneration – Generation Facility's total MW amount scheduled by MCE for end of the dispatch period.

MeteredGrossGeneration – Generation Facility's gross output in MWh measured at the Generation Facility's terminal for the dispatch period, and shall include net injection into the Grid and energy withdrawn by the Generation Facility's auxiliary equipment, station and excitation transformers, where applicable.

Tolerance – 5MWh (or 10MW for each ½ hourly Dispatch Period)

However, the MeteredGrossGeneration of some GRFs do not include energy withdrawn by the GRF's auxiliary equipment, station and excitation transformers. As such, the formula for calculating the penalty value, if the GRF deviates by more than 10MW from its dispatch schedule, is revised as follows:

$$\text{Penalty Value} = \text{Max} \{ [2 \times (\text{USEP} + \text{HEUC}) \times (| (\frac{1}{2} \times (\text{BeginSch} + \text{EndSch}) \times \text{DispatchPeriod}) - (\frac{1}{2} \times (\text{BeginAct} + \text{EndAct}) \times \text{DispatchPeriod}) | - \text{Tolerance})], \$5,000 \}$$

Where:

DispatchPeriod – The thirty-minute time interval beginning on the hour or the half-hour, i.e. has a value of ½ Hr.

BeginSch/BeginAct – Generation Facility's gross generation output (in MW) at the start of the dispatch period as recorded by PSO's EMS system.

EndSch – Generation Facility's total MW amount scheduled by MCE for end of the dispatch period.

EndAct – Generation Facility's gross generation output (in MW) at the end of the dispatch period as recorded by PSO's EMS system.

Tolerance – 5MWh (or 10MW for each ½ hourly Dispatch Period)

Example:

For a half hourly period:

USEP + HEUC = \$200 per MWh

BeginSch/BeginAct = 200MW

EndSch = 260MW

EndAct = 300MW

Tolerance = 5MWh

$$\begin{aligned} \text{Penalty} &= \text{Max} \{ [2 \times (200) \times (| \frac{1}{2} \times (200 + 260) \times \frac{1}{2} | - \frac{1}{2} (200 + 300) \times \frac{1}{2} | \\ &\quad - 5)], \$5000 \} \\ &= \text{Max} \{ 400 \times (| 115 - 125 | - 5), \$5000 \} \\ &= \text{Max} \{ \$2000, \$5000 \} \end{aligned}$$

Therefore the penalty is amounted to S\$5,000.

5 Implementation Date

The APS shall come into effect on a date to be announced by EMA after EMC has completed modifications to its IT system.