Proposed Values for Uninstructed Imbalances for the year 2010

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TSC Obligations

Paragraph 4.142 of the Single Electricity Market (SEM) Trading and Settlement Code V5.1 requires the System Operators to make a report to the Regulatory Authorities at least 4 months before the start of the Year proposing values for the five parameters outlined below used in the calculation of Uninstructed Imbalances for that Year.

This document is the System Operators' joint submission under Paragraph 4.142.

Proposed Uninstructed Imbalance Parameters

All dispatchable generation is required to follow instructions from the control centres within practical limits to ensure the safe and secure operation of the power system. Failure to do so will lead to increased constraint costs for the transmission system operators as they re-dispatch other generation at short notice to account for the mismatch in actual and instructed generation and could, at worst, lead to system blackout. Thus, economic signals to ensure that dispatchable generation follows its instructions within acceptable practical limits are required. In SEM, the uninstructed imbalance mechanism, as set out in the Trading and Settlement code, provides such signals.

The uninstructed imbalance mechanism should provide economic signals that:

- are sufficient to cause generators to follow dispatch instructions
- are cost related – where possible
- are not unreasonably punitive
- avoid perverse incentives

For a given uninstructed imbalance mechanism, the parameters allow a degree of tuning so that the above objectives can be met. It is the System Operators' opinion, based on operational experience since the start of SEM (November 2007), that the Uninstructed Imbalance parameters are providing adequate economic signals at present and that no change is currently warranted to these parameter values. As such, the System Operators propose to continue with the parameter values used since the start of SEM.

The proposed values for the parameters used in the calculation of Uninstructed Imbalances as set out in Table 1 below. The subsequent sections provide background on the setting of these parameter values.

Table 1

Parameter		Proposed Value
1.	Engineering Tolerance, ENGTOL (where 0 ≤ ENGTOL ≤ 1)	0.01
2.	MW Tolerance for each Trading Day t, MWTOLt (where 0 ≤ MWTOLt)	1
3.	System per Unit Regulation parameter, UREG	0.04
4.	Discount for Over Generation for each Generator Unit u in each Trading Period h, DOGuh (such that 0 ≤ DOGuh ≤ 1)	0.20
5.	Premium for Under Generation for each Generator Unit u in each Trading Period h, PUGuh (such that 0 ≤ PUGuh ≤ 1)	0.20

MW Tolerance (MWTOL) and Engineering Tolerance (ENGTOL)

All generating units are required to follow instructions from the control centres within practical limits. These practical limits are modelled by providing a tolerance band around the dispatch quantity to which a generating unit is instructed. When the system is operating at nominal system frequency, this tolerance band is defined as the maximum of (a) the MW Tolerance and (b) the Engineering Tolerance multiplied by the dispatch quantity.

The MW Tolerance is a MW value that defines the minimum MW tolerance at nominal frequency within which a generating unit is deemed to be complying with its dispatch instruction. A value of 1 MW has been used for the MW Tolerance in SEM to date and was also applied in the settlement of the electricity market in Ireland prior to the start of SEM. Although the Trading and Settlement Code allows the MW Tolerance parameter value to vary on a Trading Day basis, the System Operators are of the opinion that there are insufficient grounds to justify introducing a varying value.

The Engineering Tolerance, a percentage value, defines the percentage tolerance around the dispatch quantity at nominal frequency within which a generating unit is deemed to be complying with its dispatch instruction. A value of 1% has been used

since market start in SEM and, similarly to MWTOL, this value was also implemented in the electricity market in Ireland prior to SEM.

For these parameter values, at nominal frequency, the tolerance band for a generating unit is the maximum of (a) 1 MW and (b) 1% of the dispatch quantity. The System Operators believe that this minimum tolerance band continues to be reflective of the acceptable practical limits within which dispatchable generation is required to follows its instructions.

System per Unit Regulation parameter (UREG)

It is expected that, as a result of governor action, a generator's output will vary in response to fluctuations in the system frequency (known as frequency regulation). This can result in uninstructed imbalances. However, to recognise that frequency regulation is correct behaviour, the uninstructed imbalance mechanism adjusts the tolerance band to ensure that the DOG and PUG parameters do not apply to imbalances that arise as a result of frequency regulation.

The generating units on the island of Ireland normally have a governor droop setting of 4%. The coordination of droop settings ensures that generators share the requirement for regulation in proportion to their size. Therefore, at the start of the SEM, this was the value adopted for UREG. As the technical characteristics of the generators on the system have not changed, no change to this parameter value is necessary.

Discount for Over Generation (DOG) and Premium for Under Generation (PUG)

It is expected that generators should normally remain within the tolerance band. If a generator moves outside the tolerance band, additional constraint costs are incurred. It is therefore appropriate to provide economic signals to incentivise generators to remain within the tolerance band.

Over-generation outside of tolerance by a generating unit results in a need for the System Operators to instruct other generating units down from their dispatched levels to lower levels in order to balance supply and demand. Significant over-generation can necessitate dispatching a generator off load to compensate. Under-generation outside of tolerance by a generating unit results in the need to instruct other

generating units up from their dispatched levels to higher levels. In the event of unexpected or large under-generation by a generator the System Operator must act in a quick and decisive manner to restore appropriate system balance and reserve targets. This will generally necessitate dispatching on quick-start generators.

From a system security standpoint, over- or under-generation is undesirable as it can result in unnecessary ramping and cycling of units, increasing the likelihood for unit trips and / or increasing wear and tear of generating units.

Prior to the start of the SEM, a study was carried out by the System Operators[1] to evaluate the costs incurred on the system by Uninstructed Imbalances. Generally, a generating unit that over-generates should be entitled to no more than the average costs of the resources dispatched down to displace the over-generated volumes. In contrast, a generating unit that under-generates should, generally speaking, pay back at least the average costs of the resources dispatched up and on to replace the under-generated volumes.

The results of the study into the costs involved in uninstructed imbalance suggested that a value of 0.2 for both DOG and PUG provided an appropriate signal to generators to comply with dispatch instructions while ensuring that there is recovery of the additional constraint costs incurred. The System Operators believe that, based on operational experience, these values of DOG and PUG are providing sufficient economic signals to cause generators to follow dispatch instructions whenever possible, while being cost related and not overly punitive.

[1] Proposed values for Uninstructed Imbalances for the First Trading Year