



Transmission Constraint Groups

Updated June 16th 2010

Overview

Transmission Constraints are caused by limitations on the flow of power through the network.

These limitations can happen for several reasons;

- Transmission Line Overloads/Lack of voltage support
- Transmission Maintenance and Contingencies
- Generator Outages
- Wind Generation
- Customer Demand

The Transmission System Operators (EirGrid and SONI) have developed Transmission Constraint Groups (TCGs) which model different conditions on the system. TCGs are critical to producing a realistic Day Ahead Generation Schedule. These TCGs can be classified into seasonal and year-round constraints.

All Year round Transmission Constraint Groups

TCG	Description
Inter- Area Flows	<p>This constraint ensures that the total MW transferred between the two Control Areas (Northern Ireland and Republic of Ireland) does not exceed the limitations of the North-South interconnector. The TCG takes into account the rescue/reserve flows that could occur immediately post fault (e.g., loss of a large generation unit) in either Control Area.</p> <p>Currently, the inter-area flow limits are set at NI – ROI 450MW and ROI – NI 400MW. This is inclusive of the operating reserve requirements for each area.</p> <p>This is required to ensure the limits of the existing North South interconnector are respected.</p>
Moyle Interconnector	<p>This applies to all units registered as Moyle interconnector units. It ensures that all flows on the Moyle Interconnector do not exceed an import of 450/410MW (Winter/Summer) to Northern Ireland and an export of 80MW to Scotland.</p> <p>This is required to ensure that the limits associated with the Moyle interconnector are respected.</p>
South West Region	<p>This TCG ensures that the N-1 security criteria are met in the South West and applies to the generation units in Tarbert, Aghada and Marina.</p> <p>Depending on load levels and system conditions a minimum number of units on-load will be specified in addition to, at times, a minimum overall output level across the units.</p> <p>This is required to ensure that network limitations (line loading and system voltages) are respected and the network is operated within acceptable limits.</p>
Dublin Generation	<p>A minimum number of generators are required in the Dublin area to maintain operational voltage control & security standards</p>
NI Thermal Units	<p>This TCG applies to all thermal units in Northern Ireland. This TCG seeks to ensure that at least 3 of these thermal units are synchronised at all times.</p> <p>This is required to ensure there is system stability in the SONI control area.</p>
Moneypoint Generation	<p>At least one unit in Moneypoint is required on the system at all times to keep a feed onto the 400kV transmission system</p>
CHP	<p>Certain key industrial processes require that generation in Sealrock is kept on at all times.</p>
Kilroot Units	<p>This TCG is required to ensure that at least one Kilroot unit (K1 or K2) is synchronised.</p> <p>This is required to ensure voltage stability in the Belfast area and to prevent the requirement for an inter area flow reduction in a post fault scenario.</p>

North West Region	This TCG is required so that Coolkeeragh CCGT is synchronised at all times. This ensures system security in the North West.
NI Open Cycle Gas Turbines	This TCG limits the output from open cycle gas turbines in Northern Ireland to a maximum of 195MW. This is required to ensure that adequate replacement reserve is maintained at all times.
Ballylumford CCGT	This TCG is required to ensure that at least one CCGT unit (B31 or B32) is synchronised at all times. This is required due to an ongoing plant issue in the station, which is due to be rectified Oct 2010

Seasonal Transmission Constraint Groups

TCG	Description
Turlough Hill Pump Storage	<p>Turlough Hill is a unique type of unit on the system – it is required to pump at night when the demand is low and generate over the peak demand periods during the day.</p> <p>TCGs are in place to ensure the water reservoir MW level is maintained and schedule the number of units accordingly. This is important for providing primary operating reserve.</p> <p>This is required for system security - a minimum amount of water must be held in reserve at all times and the reservoir should be full by 8am every morning.</p>
Optimisation Horizon	<p>In order to realistically reflect day ahead demand peaks that impact on current generation scheduling, TCGs have been put in place that ensure units which have high start up notifications are scheduled efficiently. This typically applies to ROI units having a capacity greater than 240MW.</p> <p>This is required when the next day peak is beyond the optimisation horizon of the scheduling software. This typically occurs during winter when the peak demand period is 5-7pm.</p>
Hydro Smolt Protocol	Over the spring and early summer period as the water temperature in the rivers and lakes change, the hydro stations have to be dispatched in a very specific way to allow fish to move safely. This affects the generators in Ardnacrusha, Erne and Lee.
ROI Open Cycle Gas Turbines and Peaking Plant	<p>This TCG limits the amount of output from open cycle gas turbines and peaking plant generation units to a maximum of 380MW at all times.</p> <p>This is required to ensure that adequate replacement reserve is maintained at all times.</p>
Ballylumford Generation	<p>This TCG limits the output of Ballylumford Power Station to 1194MW from Dec-Feb and 1024MW from Mar-Nov</p> <p>This is required due to a circuit breaker restriction in the NI substation</p>