



Use of discretion and declaration of Grid Emergency 6 September 2010

Overview

A combination of system security issues on the afternoon and evening of 6 September 2010 resulted in the System Operator using discretion to constrain-on generation to maintain power system security in the upper North Island. Ultimately a grid emergency was declared to request additional generation offers to meet total North Island demand.

The System Operator has been requested to provide a brief report covering details of the event, such as the discretion used to bring on generation, grid reconfiguration and re-rating of the Hamilton Tee–Whakamaru (HAT-WKM) circuit.

Details of the Event

Due to high inflows and low marginal prices over the week prior to the event the generation mix within the North Island had changed. Lesser upper North Island generation had been offered.

This resulted in violations of N-1 thermal limits on circuits north of Whakamaru (WKM) while meeting upper North Island demand.

On the afternoon and evening of 6th September 2010 the System Operator identified issues due to a lack of cleared generation north of WKM. These issues involving loadings on the Kinleith-Tarukenga (KIN-TRK) circuits 1 & 2 for a contingent event on the Hamilton-Whakamaru (HAM-WKM) circuit.

No security constraint was available to clear additional upper North Island offered generation to resolve the issue.

Discretion was used on Huntly Unit 1 (HLY U1), Southdown (SWN) and Otahuhu B (OTC) to alleviate the issues with the circuit loadings.

An override was applied to the branch limit of the HAT-WKM circuit in an effort to get the Scheduling, Pricing and Dispatch tool (SPD) to clear the required generation. This removed the need to apply discretion on dispatched generation, although there were indications of slight price separation on either side of the HAT-WKM circuit.

Within 30 min of resolving the issues with circuit loadings, the issue reappeared due to increasing load and subsequently a grid emergency was declared to source additional generation offers north of WKM.

It was then identified that the North Island residual generation was reducing to a low level. Discretion was used to start Huntly Unit 6 (HLY U6) and Whirinaki (WHI) to meet expected total North Island demand. Once started HLY U6 and WHI were then clearing on merit through the remainder of the evening peak.

Following the earlier declaration of the grid emergency additional generation was offered. However, even with the additional generation offers, loadings on the KIN-TRK circuits remained at unacceptable levels.

Studies were carried out which identified that system splits put in place on the KIN-TRK circuits would resolve this, albeit leaving KIN on reduced security. These system splits were put in place and circuit loading issues were resolved.

For several 5 min periods around 18:00 there were insufficient generation and reserves offered to meet the total energy and reserve requirement. For these periods SPD solved with deficit reserves to enable load to be covered by the existing generation offers. This meant that the contingent event risk was not entirely covered for the North Island for three 5 minute periods.

The lack of offered generation north of WKM was the main contributing factor to this event. This was compounded by the lack of Stratford generation which had been unable to successfully return to service throughout the day. The System Operator has determined that the use of discretion to dispatch generation firstly to resolve the circuit loading issues and secondly to meet expected total North Island demand were appropriate courses of action given the situations in existence.

The System Operator is happy to answer any questions the industry may have on this event.