

## North Island Frequency Excursion on 29 April 2007

This is a summary report on the above event. It is provided for the information of participants only.

### Event description

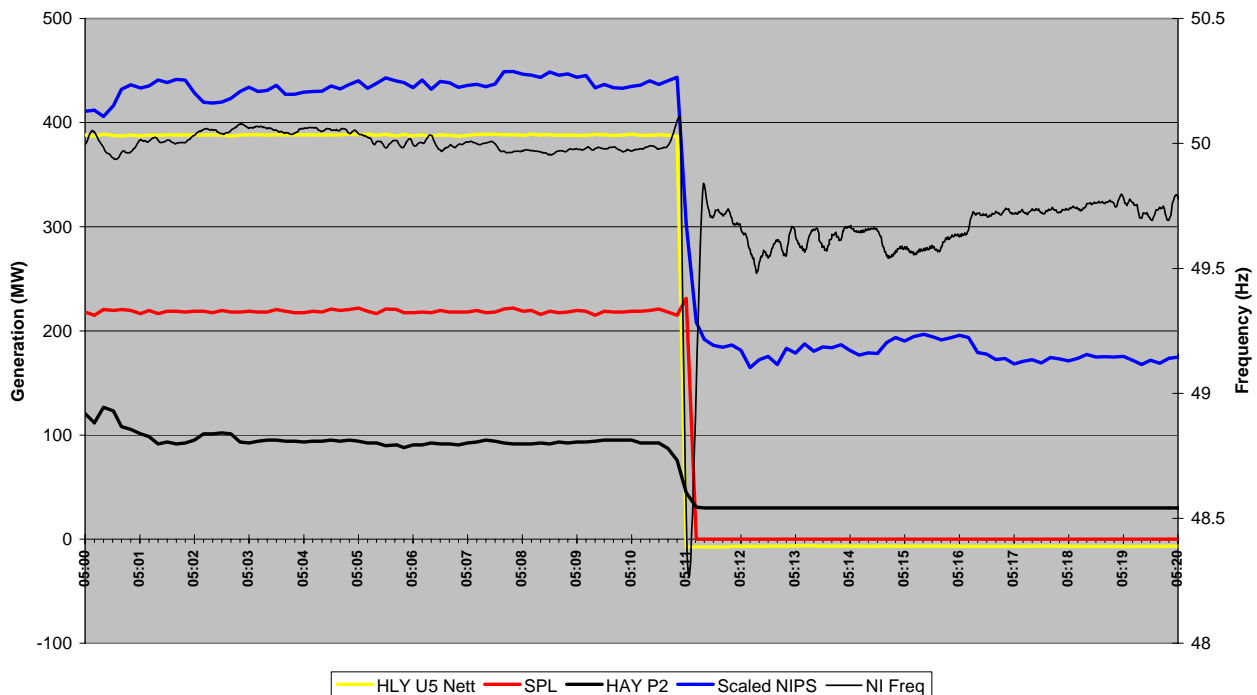
On 29 April 2007 at 05:11, there was an unplanned tripping of Huntly E3p (Huntly unit 5) while operating under an agreed commissioning plan. During the resultant under-frequency excursion the Taranaki Combined Cycle generating unit (TCC) also tripped. The North Island frequency fell to a minimum of 48.26 Hz.

### System Impact of the event

Immediately prior to the event the output of Huntly unit 5 was 387 MW and TCC was 230 MW. There was total loss of 617 MW of generation from the North Island power system.

Dispatched reserves to cover a 400 MW generation risk (Huntly unit 5), both interruptible load and generator reserves, responded to arrest the frequency fall from the unplanned loss of generation. System response included additional governor response and the ramp back of HVDC south transfer by approximately 30 MW. The combined system response ensured the North Island frequency remained above 47.8 Hz. This is the trigger frequency for the first 16% block of Automatic Under-frequency Load Shedding (AUFLS).

HLY U5 & TCC Tripping - 29-Apr-07 05:10



In a previous under-frequency excursion on 11 December 2005, TCC also tripped following a tripping at Huntly unit. This occurred under similar system conditions with the loss of 580 MW of generation and a minimum system frequency of 48.04 Hz.

### **Actions Taken**

Information from both generators that tripped in the event has been reviewed. The initial unplanned Huntly unit 5 tripping was caused by a fault in an item of equipment. Action has already been taken by the generator to address the vulnerability that resulted in the tripping of unit 5. No further action is proposed by the system operator beyond that already identified by the generator.

The subsequent tripping of TCC was of concern to the system operator, given the near identical previous event in December 2005 and similar generator response in both events. This is despite changes that had been made by the generator to resolve the issues identified at the time in December.

Initial post event modelling of the 29 April event by the system operator indicates that the combined interaction between the automatic voltage regulator (AVR) and power system stabiliser (PSS) at TCC, can result in the generating unit tripping on under-excitation if an under-frequency event occurs under some dispatch conditions.

The system operator is working with the generator concerned to identify changes required to ensure the ongoing stable operation of TCC. Interim operating restrictions have been agreed with the generator to permit TCC to remain in service until tests and any necessary setting changes to control systems can be made.

The system operator has confirmed from the results of recent under-frequency events that the Otahuhu CCGT does not appear to have a similar characteristic to those displayed by TCC on 29 April.

John Clarke  
Investigations and Planning Manager  
System Operations  
3 May 2007