Investigation of alleged breach of the Electricity Industry Participation Code 2010 by Transpower New Zealand Limited as the grid owner

On 31 July 2018, Transpower New Zealand Limited as the grid owner self-reported to the Authority that it believed on reasonable grounds that it had breached clause 4(4)(a)(ii) of Technical Code A of Schedule 8.3 of the Electricity Industry Participation Code 2010.

Under regulation 12 of the Electricity Industry (Enforcement) Regulations 2010, on 4 September 2018, the Authority appointed Peter Wakefield as the investigator to investigate the alleged breach.

Under regulation 16 of the Regulations, the investigator must promptly notify the industry participant alleged to have breached the Code of the allegations that are being investigated. On 7 September 2018, the investigator gave the grid owner such notice.

Under regulation 17 of the Regulations, at the same time as the investigator sends a notice under regulation 16, the investigator must publicise the information about the matter under investigation, including the content of the notice given under that regulation. The investigator is hereby publicising the matter under investigation and a copy of the notice given under regulation 16 is attached.

Any participant who considers that it is affected by the matter being investigated, and who wishes to become a party to this investigation, should notify the investigator within 10 working days after publication of this notice.

The investigator's contact details are:

Peter Wakefield
Senior Investigator
Electricity Authority
Phone: 04 460 8864
Mobile: 021 392 715
peter.wakefield@ea.govt.nz

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Harbour Tower
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NOTICE UNDER REGULATION 16 OF THE ELECTRICITY INDUSTRY (ENFORCEMENT) REGULATIONS 2010

Date:	7 September 2018
Addressee:	Transpower New Zealand Limited as the grid owner
Subject:	The grid owner did not ensure that it commissioned the protection system for Hamilton transformer T6 (T6) so that the protection system would be selective when operating, so that the minimum amount of assets was disconnected. On 25 January 2018, the differential protection relay operated when it should not have, and unnecessarily tripped T6 resulting in a loss of supply to a widespread area.

Investigator: Peter Wakefield , Senior Investigator, peter.wakefield@ea.govt.nz (appointed investigator under regulation 12 of the Electricity Industry (Enforcement) Regulations 2010 (Regulations)).

Notifying industry participant:

Transpower New Zealand Limited as the grid owner.

Clause allegedly breached:

Clause 4(4)(a)(ii) of Technical Code A of Schedule 8.3.
This clause requires an asset owner to design, commission, maintain and apply settings to its protection systems to be selective when operating so that the minimum amount of assets are electrically disconnected.

Circumstances of alleged breach:

On 25 January 2018, the grid owner removed Hamilton transformer T9 (T9) from Hamilton 110kV Bus B. This was to prepare for the next stage of the Hamilton 110 kV bus zone and circuit breaker fail protection project, and the circuit breaker replacement project.

At 7.48 am on 25 January 2018, the grid owner removed T9 from service and T6's protection system operated and immediately tripped T6. This was followed by the tripping of the remaining 110 kV circuits connected to Hamilton 110 kV Bus A. The tripping caused the loss of supply from the Hamilton 110 kV bus of 149.8 MW, which affected a widespread area covering Hamilton, Cambridge, Coromandel Peninsula and the wider Waikato area.

The grid owner then stopped all on-site project work in order to restore supply.

At 7.56 am, the system operator issued a grid emergency notice. At 9.24 am, the system operator ended the grid emergency after the grid owner had restored supply.

The grid owner's initial fault investigation found that the differential protection 1 SR745 relay (relay) tripped T6. The grid owner's on-site investigation found that the relay case was only partially connected on two phases to the relay.

The removal of T9 from service caused an increase in load on T6. The grid owner believes that because the two phases were not completely connected to the relay, the increase in load on T6 caused sufficient current imbalance to operate T6's relay, and trip T6.

At 3.37 pm, the grid owner returned T6 to service after it replaced the relay case for T6's

relay, and completed testing the protection system.

The grid owner's subsequent investigation found that during project work carried out the previous week:

- the relay was inserted into the relay case, locked, and reporting "relay in service", even though the yellow and blue phases' currents were only partially connected between the relay case and the relay.
- the relay test values (during stability and on-load tests), which indicated incorrect currents on the yellow and blue phases, were overlooked in the commissioning process.

Date and time of alleged breach:

- 19 January 2018 to 25 January 2018

Please note, under regulation 16 of the Regulations, you are obliged to respond to this allegation, in writing, to the investigator within 10 working days of receipt of this notice (unless the investigator allows, in writing, a longer period).

Please provide your response by return email to the investigator.

Include the following in your response:

Whether you believe you have breached the Code

Whether there is another provision you consider more accurately describes the nature of the event

A full explanation of the circumstances surrounding the alleged breach

Identification of any information provided in your response that you consider confidential and that should not be included in the investigator's report under regulation 19 of the Regulations (regulation 15(2) of the Regulations).