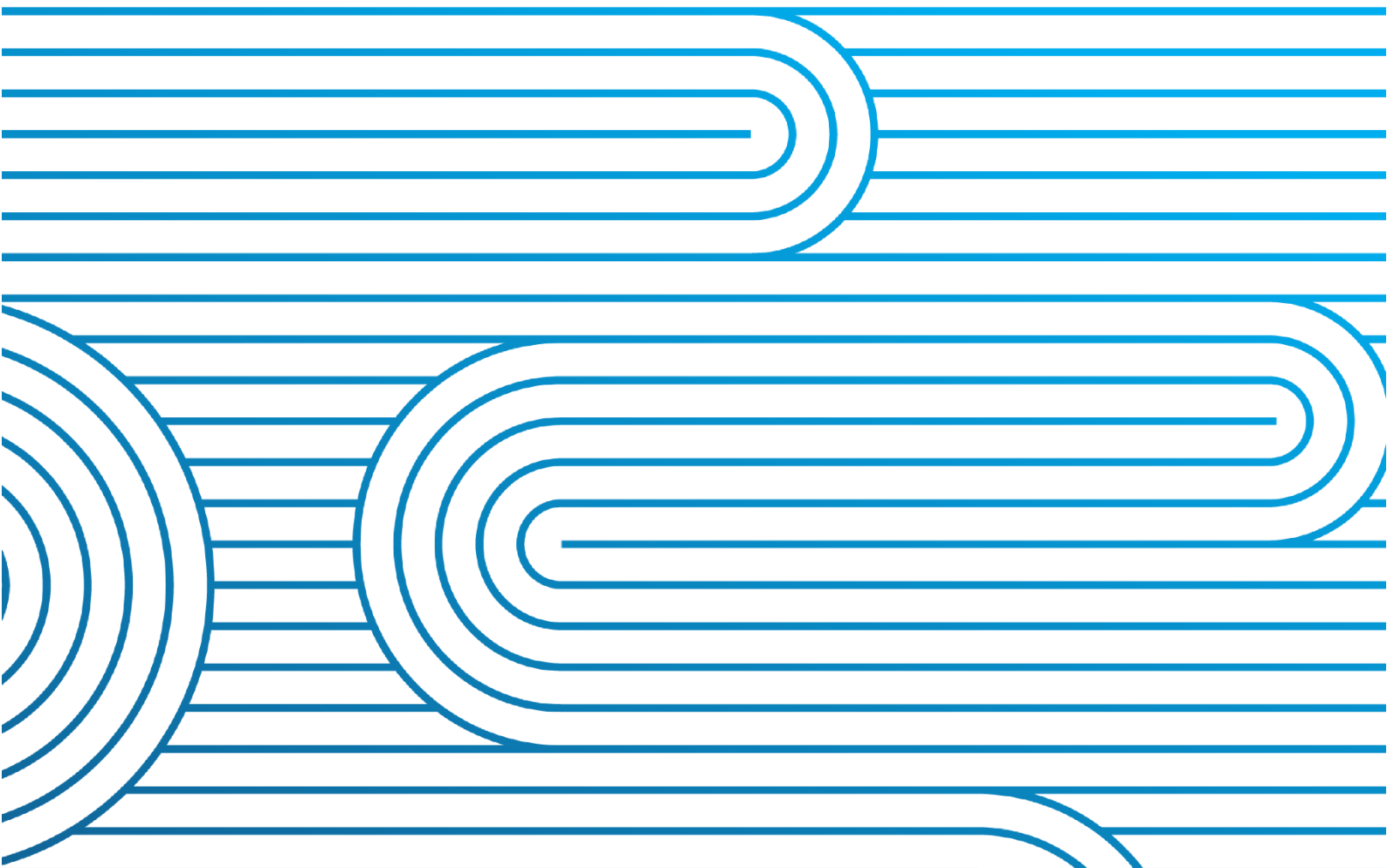


# Causation Report

## 4 February 2026 20:29:33

### Under-Frequency Event

System Operator Event 4686  
06 May 2026



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## IMPORTANT

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## PURPOSE

On 4 February 2026 at 20:29:33, a reduction of electricity into the power system caused the system frequency in the North Island to fall below 49.25 Hz, resulting in an under-frequency event.

Pursuant to clause 8.60 of the Electricity Industry Participation Code (**Code**), the System Operator investigated the event to assist the Electricity Authority (**Authority**) in determining the causer of the under-frequency event.

This Causation Report is provided to the Authority pursuant to clause 8.60(5) of the Code and includes the following:

- The System Operator's recommendation of the causer of the under-frequency event.
- The System Operator's reasons for forming its view.
- The information considered in reaching this view.

## EXECUTIVE SUMMARY

At 20:29:13 on 4 February 2026 HVDC Pole 3 began to ramp-down to its minimal operation level and subsequently tripped at 20:30:11. Pole 2 was in service at the time of the event, however due to the initial ramp-down, Pole 2 did not respond in a “self-cover” manner by activating its overload capability until Pole 3 tripped.

The reduction in Pole 3 transfer received at Haywards from 373 MW to 34 MW created an immediate power imbalance between the islands. At 20:29:33, the North Island frequency fell to 49.20 Hz. The North Island frequency falling below 49.25 Hz constitutes an under-frequency event, as defined in the Code.

Transpower as Grid Owner has stated that it believes the ramp-down of Pole 3 was the cause of the under-frequency event at 20:29:33. Investigation into the ramp-down and subsequent tripping of Pole 3 supports the Grid Owner’s position that the ramp-down of Pole 3 caused the under-frequency event. Accordingly, the System Operator recommends Transpower as Grid Owner be found as the causer of the under-frequency event at 20:29:33 on 4 February 2026.

## SYSTEM EVENTS – 4 FEBRUARY 2026

### Prior to the under-frequency event

On 4 February 2026, the New Zealand electricity system was operating under normal conditions, with typical demand patterns for summer weekday evening loads in both the North and South Islands. At the time of the event, the HVDC link was operating under normal dispatch conditions.

The System Operator had scheduled the HVDC link between Benmore and Haywards for 786 MW DC North. The power transfer the time of the event was 772 MW sent from Benmore, with 745 MW received at Haywards. Normal modulation action was reducing the power sent, and transfer losses explain the lower MW received. Both Pole 2 and Pole 3 of the Benmore - Haywards HVDC Link were enabled to provide full northward transfer capacity, and instantaneous reserves (FIR and SIR) were enabled according to prevailing contingency risk and the Ancillary Services Procurement Plan (ASPP).

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### The under-frequency event

At 20:29:13, the HVDC Pole 3 suddenly ramped down as a result of a current limit being applied, reducing transfer into the North Island power system from 373 to 34 MW.

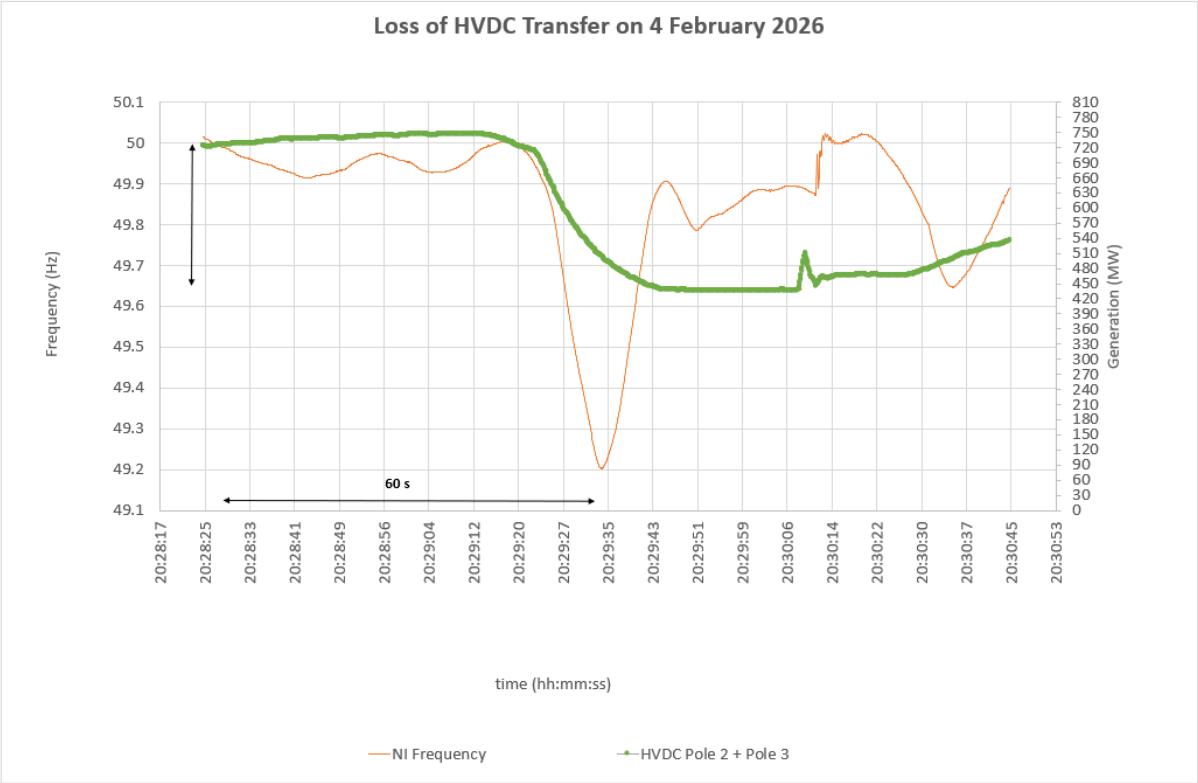
The Grid Owner confirmed that the current on Pole 3 was limited due to a failure of the cubicle power supply of the blue-phase converter transformer at Benmore, which resulted in the loss of transformer cooling capability.

Consequently, Pole 3's transfer was reduced to its minimum operational level. This reduction in transfer created a power imbalance between the islands: the North Island frequency dropped to 49.20 Hz, while the South Island frequency increased to 51.03 Hz. As Pole 3 was current-limited rather than fully tripped, Pole 2 was not released to its overload capability (where it would have increased its pre-event transfer from 386 MW up to 700 MW from Benmore), meaning that the system did not benefit from the additional northward transfer normally available during a single-pole contingency.

The event therefore resembled a single-pole trip (DCCE) but without the compensatory HVDC response of the remaining Pole to self-cover its reserve requirement, placing additional reliance on FIR and SIR for frequency control.

Following the under-frequency event Pole 3 subsequently tripped at 20:30:11 by which time the North island frequency had recovered to 49.94 Hz.

North Island Frequency



## EVENT INVESTIGATION AND CAUSER RECOMMENDATION

The System Operator undertook an investigation taking into account System Operator data as well as information provided by the Grid Owner. Correspondence with the Grid Owner is provided in Appendix 1. The investigation determined that:

- The root cause of this event was an equipment failure within the Benmore HVDC Pole 3 blue-phase converter transformer cubicle. Specifically, the failure of the 230 VAC/24 VDC power supply triggered incorrect cooling status indication within the HVDC control system.
- No other generation tripped at the time of the event.
- The Grid Owner accepts that they are the causer of the event.

Therefore, the System Operator recommends that Transpower as Grid Owner is found the causer of the under-frequency event at 20:29:33 on 4 February 2026.



## CALCULATION OF MW LOST

The purpose of this calculation is to determine the MW value provided to the clearing manager for the purposes of calculating the under-frequency event charge.

The System Operator follows the procedure 'Calculating the Amount of MW lost' (PR-RR-017) to determine the MW lost. This procedure follows the formula set out in clause 8.64 of the Code for calculating an event charge.

The event charge payable by the causer of an under-frequency event (referred to as "Event e" below) must be calculated in accordance with the following formula:

$$EC = ECR \times \left( \sum_y INT_{y,e} - INJ_D \right)$$

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where

$EC$  is the event charge payable by the causer

$ECR$  is \$1,250 per MW

$INJ_D$  is 60 MW

$INT_{y,e}$  is the electric power (expressed in MW) lost at point  $y$  by reason of Event  $e$  (being the net reduction in the injection of electricity (expressed in MW) experienced at point  $Y$  by reason of Event  $e$ ) excluding any loss at point  $y$  by reason of secondary Event  $e$

$y$  is a point of connection or the HVDC injection point at which the injection of electricity was interrupted or reduced by reason Event  $e$

As the  $ECR$  and  $INJ_D$  values are constants the values to calculate and complete the formula are  $y$  and  $INT_{y,e}$ .

Using the event charge formula the calculation is as follows:

Event Charge = \$1250/MW \* (210.37MW – 60MW)

Event Charge = \$187,962.50

## Appendix 1: CORRESPONDENCE

### 1.1 CONFIRMATION OF EVENT NOTICE

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TRANSPower



### Customer Advice Notice

**To:** CAN NZ Participants

**Sent:** 10-feb-2026 17:10

**Ref:** 7119757523

**From:** The System Operator

**Telephone:** 0800 488 500

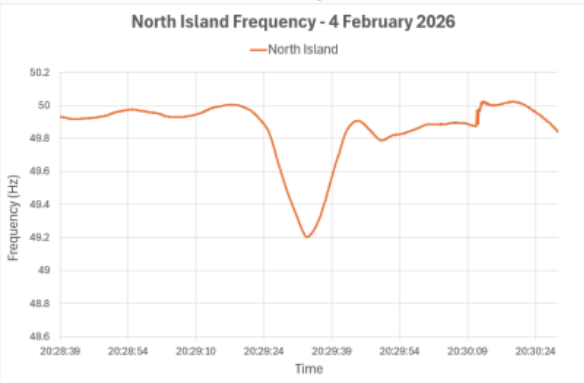
**Email:** NMDData@transpower.co.nz

**Revision of:**

|                                    |
|------------------------------------|
| Under-Frequency Event Confirmation |
|------------------------------------|

The System Operator wishes to advise market participants of an under-frequency event which occurred in the North Island on 4 February 2026.

North Island Frequency - 4 February 2026



|                                        |              |
|----------------------------------------|--------------|
| <b>Event ID:</b>                       | 4686         |
| <b>Affected Islands:</b>               | North Island |
| <b>North Island Minimum Frequency:</b> | 49.20 Hz     |
| <b>Time (start of UFE):</b>            | 20:29:33     |
| <b>Time (of min. frequency):</b>       | 20:29:34     |

The System Operator is investigating the cause of the following under-frequency event in accordance with Part 8, clause 8.60 (1) of the Electricity Industry Participation Code 2010. Ancillary Services Agents who were dispatched to provide instantaneous reserves at the time of the event should be prepared to provide information to the System Operator within 5 Business Days of receiving a request for information in accordance with clause 8.60(4) of the Electricity Industry Participation Code 2010.

**Market Operations**

Transpower NZ Ltd  
P.O. Box 1021,  
Wellington 6140,  
New Zealand  
Telephone: 04 590 7470  
[market.operations@transpower.co.nz](mailto:market.operations@transpower.co.nz)

A revision of this notice will be issued if there is any change to the situation above.

Transpower New Zealand Ltd The National Grid

## 1.2 SYSTEM OPERATOR REQUEST FOR INFORMATION – GRID OWNER



Waikoukou  
22 Boulcott Street  
PO Box 1021  
Wellington 6140  
New Zealand  
[www.transpower.co.nz](http://www.transpower.co.nz)

Click or tap to enter a date.

13 February 2026

Melanie Marr  
Grid Compliance Manager  
Grid Owner  
Transpower  
Wellington

Dear Melanie,

### 4 February 2026 Under-Frequency Event

At 20:29:33 on 4 February 2026 an under-frequency event occurred in the North Island. We are investigating the event and require the following information from you:

- **Detailed account of the event:** SCADA indicates that HVDC Pole 3 reduced power to its minimum operational level and subsequently tripped. Please confirm what caused the Pole 3 behaviour, if Pole 3 attempted to restart, and any other information you consider relevant to this under-frequency event.
- **Confirmation or alternative data for MW loss:** Our preliminary assessment of SCADA/PI data indicates a loss of approximately 300 MW at HAY2201 during the event. Could you please confirm this value based on your site-specific data. If your data indicates a different value for the MW loss, please provide the alternative figure and any supporting information or logs.
- **Assessment of causation under the Code:** Based on your operational data could you please provide your assessment of whether or not your actions, or the behaviour of your assets, could have been the causer of the under-frequency event as per the Code. Please provide a reasoned explanation for your assessment.

Please provide the above information to us in writing by **5pm, Friday 13 March 2026**.

The information you provide will be used by the system operator to recommend to the Electricity Authority who the causer of the event was. The Electricity Authority will make the final determination of causer.

Please contact me if you require any further information.

Yours sincerely,

Anura Mutunayake  
Senior Power Systems Engineer

CC:  
**Samantha Naidoo**  
Corporate Counsel - Compliance & Impartiality

## 1.3 GRID OWNER RESPONSE

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**TRANSPower**

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+64 4 495 7000  
[www.transpower.co.nz](http://www.transpower.co.nz)

06 March 2026

Anura Mutunayake  
Senior Power System Engineer  
22 Boulcott Street  
Wellington

**Response to Request for Information: Under-Frequency Event on 04 February 2026**

Dear Anura,

Thank you for your request regarding the under-frequency event on 04 February 2026.

We are pleased to provide this response ahead of the 13 March deadline. Please refer to Appendix A & B for detailed responses to your questions regarding the UFE.

If you require any clarification or additional information, please feel free to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Melanie Marr", written over a light blue horizontal line.

Melanie Marr  
[Compliance & Quality Advisor \(Contractor\)](#)

CC:  
Samantha Naidoo  
[Corporate Counsel – Compliance & Impartiality Manager](#)  
Anna Li  
[Engineering Assurance Manager, SO Power Systems Group, Operations](#)

## Appendix A – Response to System Operator request for information regarding the 04 February 2026 UFE.

| System Operator Questions                                                                                                                                                 | Grid Owner's Response                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Detailed account of the event:</b><br>SCADA indicates that HVDC Pole 3 reduced power to its minimum operational level and subsequently tripped.                        | 1. Please confirm what caused the Pole 3 behaviour.                                                                                                                  | The initial ramp of Pole 3 to minimum power was caused by the failure of a 230VAC/24DC power supply in the Benmore T30 blue phase converter transformer cubicle. This caused the HVDC controls to believe that Benmore T30 blue phase had cooling faults on all cooler groups and therefore not cooling, so Pole 3 was automatically ramped to minimum power (35MW).<br><br>The subsequent trip of Pole 3 was due to both Pole Control systems reporting a "Abnormal Operating Range Level 2" condition. This alarm comes up when the actual DC current exceeds the maximum value of DC current for more than 8 seconds. |
|                                                                                                                                                                           | 2. If Pole 3 attempted to restart.                                                                                                                                   | Pole 3 did not attempt to restart during this event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                           | 3. Any other information you consider relevant to this under-frequency event.                                                                                        | The Pole 2 overload was not released for the initial ramp down of Pole 3 to minimum power as the other pole overload is only released in the case of a pole tripping. This is as per the current design. Pole 2 overload was released for the subsequent Pole 3 trip, but this was too late to address the under-frequency event.                                                                                                                                                                                                                                                                                        |
| <b>Confirmation or alternative data for MW loss:</b><br>Our preliminary assessment of SCADA/PI data indicates a loss of approximately 300 MW at HAY2201 during the event. | 4. Could you please confirm this value based on your site-specific data.                                                                                             | Transient Fault Recorder (TFR) triggers did not capture the start of this event so high-resolution data for the whole event is not available. From analysing lower resolution PI data from the HVDC controls we get 306MW lost at HAY2201 over a 32 second interval.                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                           | 5. If your data indicates a different value for the MW loss, please provide the alternative figure and any supporting information or logs.                           | Refer to Appendix B - Screenshot from PI Vision.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Assessment of causation under the Code:</b><br>Based on your operational data could you please.                                                                        | 6. Provide your assessment of whether or not your actions, or the behaviour of your assets, could have been the causer of the under-frequency event as per the Code. | Our assets were the cause of this under-frequency event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                           | 7. Please provide a reasoned explanation for your assessment.                                                                                                        | Equipment failure at Benmore Pole 3 ultimately caused the sequence of events which led to the under-frequency event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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## Appendix B – Screenshot from PI Vision

