

The Authority's draft determination of causer

Draft determination of the causer of the 9 February 2018 under-frequency event Consultation paper

Submissions close: 5 pm 12 June 2018

15 May 2018



Executive summary

An under-frequency event occurred on 9 February 2018

The Electricity Industry Participation Code 2010 (Code) requires the Electricity Authority (Authority) to determine the causer of an under-frequency event (UFE), and prescribes the process for making its determination (clause 8.61).

The purpose of this paper is to:

- (a) set out the Authority's draft determination of the causer of the 9 February 2018 UFE
- (b) consult with interested parties on the Authority's draft determination.

The Authority's draft determination of the causer

The Authority's draft determination under clause 8.61 of the Code is that Contact Energy Limited (Contact), as the asset owner, was the causer of the UFE on 9 February 2018.

The Authority's reasons for the draft determination are:

- (a) the system operator has investigated the UFE (in accordance with clause 8.60 of the Code), and has reported to the Authority that:
 - (i) the interruption/reduction of energy occurred at the Taranaki Combined Cycle (Stratford) power station, which belongs to Contact
 - (ii) no other asset was identified as having caused or potentially caused the UFE
 - (iii) in the system operator's view, Contact is the causer of the UFE
- (b) Contact has accepted that it was the causer of the UFE
- (c) having considered the system operator's reports and the relevant elements of the Code, the Authority (based on the information available to it at this time) concurs with the system operator's findings.

Submissions are invited from interested parties

The Authority must consult with interested parties before making its final determination. Interested parties are invited to make a submission on the Authority's draft determination by 5 pm on Tuesday 12 June 2018.

The Authority will consider all submissions received, and make a final determination on the UFE.

The Authority also invites comment on the system operator's calculation of the megawatts (MW) lost during the event, which the system operator uses for calculating the UFE charge.

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1 What you need to know to make a submission

What this consultation paper is about

- 1.1 The purpose of this paper is to consult with interested parties on the Authority's draft determination that:

- (a) Contact was the causer of the 9 February 2018 UFE at 05:04 hours, when the frequency dropped to 49.23 Hz in the North Island.

How to make a submission

- 1.2 The Authority's preference is to receive submissions in electronic format (Microsoft Word) in the format shown in Appendix A. Submissions in electronic form should be emailed to submissions@ea.govt.nz with "Consultation Paper—Draft determination of the causer of the 9 February 2018 under-frequency event" in the subject line.
- 1.3 If you cannot send your submission electronically, post one hard copy to either of the addresses below, or fax it to 04 460 8879.

Postal address

Submissions
Electricity Authority
PO Box 10041
Wellington 6143

Physical address

Submissions
Electricity Authority
Level 7, ASB Bank Tower
2 Hunter Street
Wellington

- 1.4 Please note the Authority wants to publish all submissions it receives. If you consider we should not publish any part of your submission, please:
- (a) indicate which part you do not want published
- (b) explain why you consider we should not publish that part
- (c) provide a version of your submission that we can publish (if we agree not to publish your full submission).
- 1.5 If you indicate there is part of your submission that should not be published, we will discuss with you before deciding whether to not publish that part of your submission.
- 1.6 However, please note that all submissions we receive, including any parts that we do not publish, can be requested under the Official Information Act 1982. This means we would be required to release material that we did not publish unless good reason existed under the Official Information Act to withhold it. We would normally consult with you before releasing any material that you said should not be published.

When to make a submission

- 1.7 Please deliver your submissions by **5 pm on 12 June 2018**.
- 1.8 The Authority will acknowledge receipt of all submissions electronically. Please contact the Submissions' Administrator if you do not receive electronic acknowledgement of your submission within two business days.

2 The Authority's draft determination

Contact was the causer of the under-frequency event

- 2.1 The Authority's draft determination under clause 8.61 of the Code is that Contact was the causer of the UFE that occurred on 9 February 2018 at 05:04 hours.
- 2.2 The system operator has investigated the UFE and reported to the Authority that:
 - (a) a UFE occurred when frequency fell to 49.23 Hz in the North Island following a 196.7 MW reduction of electricity injected from the Stratford power station on 9 February 2018
 - (b) no other asset was identified as having caused or potentially caused the UFE
 - (c) in the system operator's view, Contact was the causer of the UFE
 - (d) Contact has accepted that it was the causer of the event.
- 2.3 Having considered the system operator's report and the relevant elements of the Code, the Authority (based on the information available to it at this time) concurs with the system operator's findings.

3 How the Authority reached this draft determination

The system operator investigated the causer

- 3.1 Clause 8.60 of the Code requires the system operator to investigate the causer of a UFE and provide a report to the Authority.
- 3.2 The system operator has fulfilled its obligations under clause 8.60. The system operator's report to the Authority (dated March 2018) is attached as Appendix B.
- 3.3 The circumstances described in the report for the UFE are summarised as:
 - (a) On 9 February 2018 at 05:04 an interruption or reduction of energy occurred at the Stratford grid injection point (SFD). The frequency drop was arrested at 49.23 Hz in the North Island.
 - (b) The HVDC link and reserves operated and frequency was restored to the normal band quickly with no significant frequency overshoot.
 - (c) No other event was identified as contributing to or causing the UFE.
 - (d) The system operator has assessed the loss of injection of electricity into the grid to be 196.7 MW.
- 3.4 Copies of the following correspondence with Contact are included in the report:
 - (a) the system operator wrote to Contact (13 February 2018) setting out its view that the event was initiated at the Stratford power station resulting in a loss of injection, and seeking any information Contact could provide
 - (b) in its reply to the system operator (7 March 2018), Contact agreed it was the causer of the event and agreed with the system operator's assessment of injection lost (Contact did not provide any further information).

The Authority has considered the system operator's report

- 3.5 Clause 8.61(2) of the Code requires the Authority to publish a draft determination that states whether the UFE was caused by a generator or grid owner, and, if so, the identity of the causer. Clause 8.61(3) of the Code requires the Authority to give reasons for its findings in the draft determination.
- 3.6 The Authority has considered the system operator's report and liaised directly with system operator staff in relation to the system operator's investigation and report.
- 3.7 Based on the information available to it, the Authority concurs with the system operator's findings that Contact was the causer of the UFE on 9 February 2018. The Authority's draft determination and reasons are set out in section 2.

Q1. Do you agree with the Authority's draft determination that Contact was the causer of the 9 February 2018 UFE? If not, please state your alternative view on the causer and give your reasons.

4 The Authority will consider submissions and make a final determination

- 4.1 Clause 8.61(4) of the Code requires the Authority to consult every generator, grid owner and other participant substantially affected by a UFE in relation to a draft determination.
- 4.2 The Authority has allowed a consultation period of four weeks for this draft determination.¹ Accordingly, the deadline for submissions is 5 pm on Tuesday 12 June 2018.
- 4.3 The Authority will consider submissions received, and publish its final determination.
- 4.4 Clauses 8.62 and 8.63 of the Code set out provisions relating to any disputes regarding Authority determinations.

5 The system operator has calculated the MW lost during the event based on its investigations

- 5.1 Clause 8.64 of the Code prescribes how the system operator must calculate the event charge payable by the causer of a UFE. This in turn enables calculation of the rebates paid for UFEs (clause 8.65 of the Code).
- 5.2 Central to the event charge calculation is determining the MW of injection lost at one or more grid injection points as a result of the UFE.
- 5.3 The system operator determines the MW lost as part of its investigation into a UFE.
- 5.4 The system operator has followed its published procedure *PR-RR-017 Calculating the Amount of MW lost* to determine the MW value provided to the clearing manager for the purposes of calculating the UFE charge. This procedure includes a factor of 95 per cent applied to the MW lost value to account for any margin of error.

¹ The Authority discusses its approach to setting consultation periods for draft determinations in its consultation on the 8 September 2016 UFE.

- 5.5 Based on its investigation and the application of its procedure, the system operator has determined that the loss of injection into the grid as a result of the 9 February 2018 event was 196.7 MW at the Stratford grid injection point, resulting in an event charge of \$170,875.
- 5.6 The system operator's calculation of the MW lost during the UFE for the purposes of calculating the UFE charge is included in its report. Note this calculation does not form part of the Authority's draft determination. However, the Authority acknowledges that the calculation is central to determining the UFE charge payable by the causer, and therefore also to the rebates paid for UFEs.
- 5.7 Accordingly, the Authority invites comment on the system operator's calculation of the MW lost, as set out in the system operator's report to the Authority.

Q2. Do you agree with the system operator's calculation that, for the purposes of calculating the UFE charge, 196.7 MW was lost at the Stratford grid injection point as a result of the 9 February 2018 UFE? If not, please state your alternative view on the MW lost and give your reasons.

Appendix A Format for submissions

Submitter	
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Question	Comment
Q1. Do you agree with the Authority's draft determination that Contact was the causer of the 9 February 2018 UFE? If not, please state your alternative view on the causer and give your reasons.	
Q2. Do you agree with the system operator's calculation that, for the purposes of calculating the UFE charge, 196.7 MW was lost at the Stratford grid injection point as a result of the 9 February 2018 UFE? If not, please state your alternative view on the MW lost and give your reasons.	

Appendix B Under Frequency Event 9 February Causation Report

Under-Frequency Event – 09 February 2018

Causation Report

System Operator Event 3504

March 2018

Keeping the energy flowing



TRANSPower



Version	Date	Change
01	12 Feb 2018	Report drafted ready for data entry
02	08 Mar 2018	Report for peer review
03	12 Mar 2018	Final Issue

	Position	Date
Prepared By:	Kevin Wronski, Risk and Compliance Manager	Mar 2018
Reviewed By:	Scott Avery, Power Systems Group Manager, System Operations	Mar 2018

IMPORTANT

Disclaimer

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PURPOSE

1. At 05:04 on 09 February 2018 an interruption or reduction of energy occurred in the power system. The frequency fell to 49.23 Hz in the North Island.
2. As the frequency fell to below 49.25 Hz and as per clause 8.60 of the Electricity Industry Participation Code ('the Code') Transpower, as system operator, investigated this event to assist the Electricity Authority in determining the causer of the under-frequency event.
3. The result of this investigation is this report prepared under clause 8.60(5) of the Code, provided to the Authority, and includes:
 - Whether in Transpower's view the UFE was caused by the grid owner or a generator and identifies that potential causer;
 - The reasons for forming this view; and
 - The information considered in reaching this view.

UNDER FREQUENCY EVENT DETAILS

4. On 09 February 2018 at 05:04 an interruption or reduction of energy occurred into the grid. In response the HVDC link and reserves operated to prevent a substantial fall in the frequency. The frequency was arrested at 49.23 Hz in the North Island.
5. The frequency was restored to the normal band quickly with no significant frequency overshoot.
6. Excursion Notices were sent immediately following the event

North Island

Date	Time	Minimum Hz	Island
09-Feb-2018	05:04:51	49.23	North

Date	Time	Maximum Hz	Island
09-Feb-2018	05:05:08	50.312	North

7. On 09 February 2018 Transpower published a 'Confirmation of Event' notice. (see appendix 1.1).
8. Analysis identified that the interruption/reduction in energy occurred at the Stratford grid injection point (SFD). No other event was identified as contributing or causing the under-frequency event.
9. On 13 February a letter was sent (see appendix 1.2) that outlined the details of the event and asked Contact Energy Ltd:
 - Whether Contact Energy considered itself to be the "causer" of the under-frequency event as defined in the Code;
 - whether Contact Energy agreed with the assessment of the loss of injection of electricity to the grid for the event was 196.7 MW (207.1 MW × 95% - to account for the margin of error); and
 - any additional information to support their views.
10. On 07 March Contact Energy responded (see appendix 2.1) and accepted that due to the tripping of the Taranaki Combined Cycle power plant (TCC) they were the causer of the event and the assessed MW value of 196.7MW. No further information was provided.

CALCULATION OF MW LOST

11. To determine the MW value provided to the clearing manager for the purposes of calculating the under-frequency event charge. Transpower, as system operator, follows procedure PR-RR-017 "Calculating the Amount of MW lost".
12. This procedure follows the formula set out under section 8.64 of the Code for evaluating 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:

$$EC = ECR * (\sum_y (INT_{ye} \text{ for all } y) - INJ_d)$$

where

EC is the **event charge** payable by the causer

ECR is \$1,250 per MW

INJ_d is 60MW

INT_{ye} 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

13. As the ECR and INJ_d values are constants the values to calculate and complete the formula are Y and INT_{ye}.
14. On 09 February the tripping of the TCC plant resulted in an interruption of energy into the grid at the Stratford grid injection point (GIP).
15. To establish the amount of MW lost SCADA data was extracted for the 60 seconds prior to the frequency reaching 49.25 Hz for generation behind the Stratford bus. After evaluation, the amount of MW lost causing the frequency to fall below 49.25Hz was determined to be 207.1 MW. For this event the loss of MW was virtually instantaneous and the 207.1 MW of generation passing through the Stratford bus into the network was completely lost when the frequency reached 49.25 Hz.
16. A factor of 95% is applied to the MW lost value to account for any margin of error, reducing the MW lost value to 196.7 MW.
17. As a result, the final formula is as follows

$$EC = ECR * (\sum_y (INT_{ye} \text{ for all } Y) - INJ_d)$$

$$EC = \$1250 * (1 * (196.7\text{MW}) - 60\text{MW})$$

$$EC = \$170,875$$

FINDING

18. Initial analysis identified the interruption or reduction of energy on 09 February 2018 occurred at the Stratford grid injection point, as a result of a tripping of the Taranaki Combined Cycle power plant. This asset belongs to Contact Energy Ltd.
19. In the response of 07 March 2018, Contact Energy Ltd. accepted that they were the causer of the event on 09 February 2018.
20. No other asset was identified as having caused or potentially causing the under-frequency event.
21. As such, Transpower, as the system operator, recommends that Contact Energy Ltd. be determined the causer of the under-frequency event on 09 February 2018.

Appendix 1: SYSTEM OPERATIONS CORRESPONDENCE

1.1 CONFIRMATION OF EVENT NOTICE


TRANSPower

Monina Sta Romana
Tel: (04) 590 6615
Email: monina.staromana@transpower.co.nz

Transpower House
96 The Terrace
PO Box 1021
Wellington 6140
New Zealand
P 64 4 495 7000
F 64 4 495 7100
www.transpower.co.nz

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Date: 9 February 2018

To: Market Participants

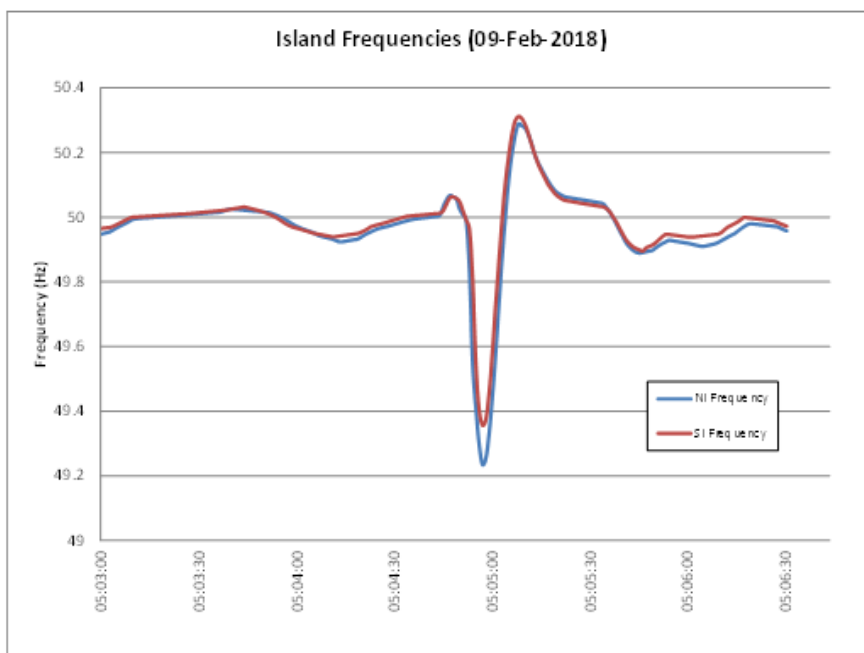
cc: Clearing Manager

From: System Operator

Under-Frequency Event Confirmation

The System Operator wishes to advise market participants of the under-frequency event which occurred in the North Island on 09 February 2018.

Event ID	3504
Affected Islands:	North Island
North Island Minimum Frequency:	49.23 Hz
Time (start of UFE):	05:04:57
Time (of min. frequency):	05:04:57



Market Operations
Transpower NZ Ltd
P.O. Box 1021,
Wellington,
New Zealand
Telephone : 04 590 7470
Facsimile : 04 495 7154

1.2 PRIOR NOTIFICATION OF CAUSER


TRANSPower

Monina Sta Romana
Tel: (04) 590 6615
Email: monina.staromana@transpower.co.nz

Transpower House
96 The Terrace
PO Box 1021
Wellington 6140
New Zealand
P 64 4 495 7000
F 64 4 495 7100
www.transpower.co.nz

13 February 2018

Gerard Demler
Contact Energy Limited
P.O. Box 10742
Wellington

Dear Gerard,

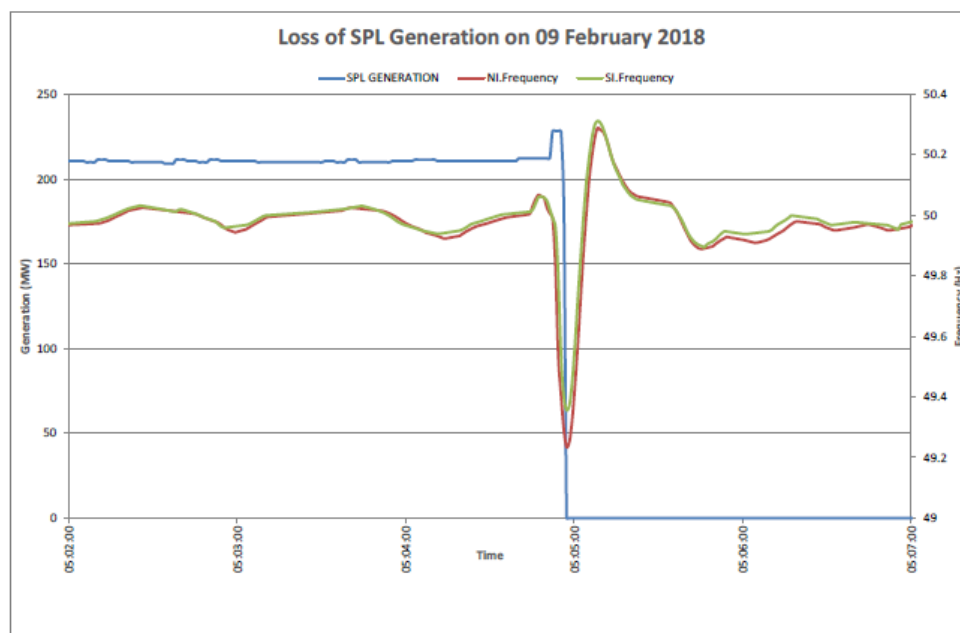
9 February 2018 North Island Under-Frequency Event

On 9 February 2018, an under-frequency event occurred in the North Island at 05:04. Based on the information available we believe that the event was initiated at a Stratford generator resulting in a loss of injection from the Stratford power stations.

In order to report to the Electricity Authority as required by clause 8.60 of the Electricity Industry Participation Code 2010. We would appreciate any information you can provide around this event, and whether you accept Contact Energy Limited is the causer of the under-frequency event.

We have also calculated the loss of injection of electricity to the grid for the event as 196.7 MW ($207.1 \text{ MW} \times 95\%$ - to account for the margin of error). If you have a view on the amount of electricity lost during this event, please include that information in your response.

After receipt of your information Transpower, as the system operator will prepare a report for the Electricity Authority including whether the under-frequency was caused by a generator or grid owner, the identity of the potential causer, the reasons for and all the information considered in reaching our view.



Could you please respond to the System Operator with your information relating to this event no later than 6 March 2018.

Return email address: market.operations@transpower.co.nz


Regards,

Monina Sta Romana
Market Analyst, Market Operations
CC Scott Avery (System Operator)

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Appendix 2: CONTACT ENERGY CORRESPONDENCE


2.1 CONTACT ENERGY RESPONSE




Gerard Demler <Gerard.Demler@contactenergy.co.nz> | Monina Sta Romana

RE: Under-Frequency Event (09Feb2018)

 You forwarded this message on 7/03/2018 3:11 PM.

 Under-Frequency Event (09Feb2018)
Outlook item


 CAN Under-Frequency Event Confirmation 2682041223.pdf
329 KB

Hi Monina,

I agree with the amount of energy lost as per the attached and that SPL was the causer of that event.

Regards,

Gerard

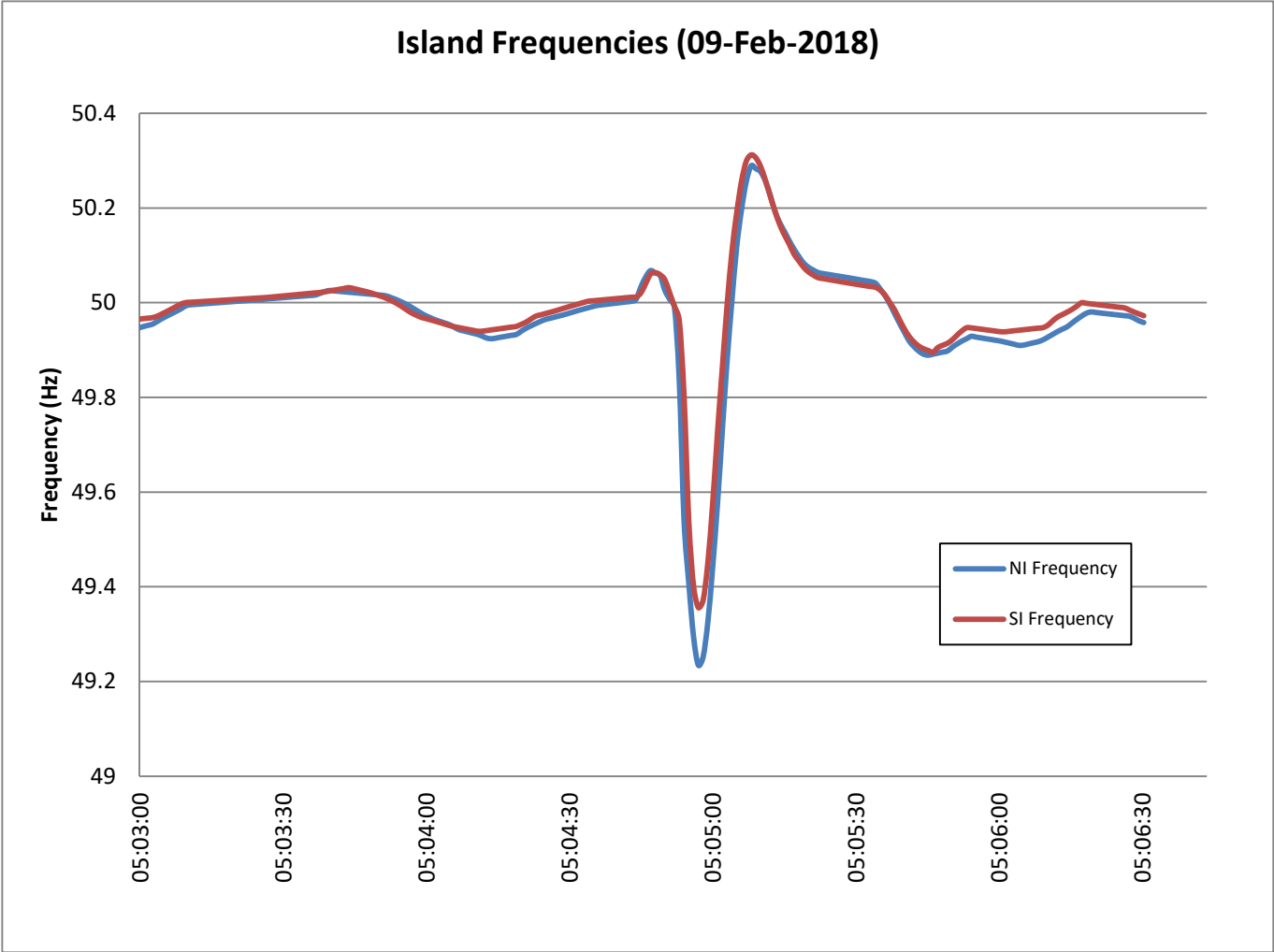
 The linked image cannot be displayed. The fi...

PO Box 10742, Wellington 6143
Level 2, Harbour City Tower
29 Brandon Street
Wellington, New Zealand
contactenergy.co.nz

Appendix 3: CHARTS

3.1 ISLAND FREQUENCIES

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3.2 LOSS OF STRATFORD (SPL) GENERATION

