

SETTLEMENT AGREEMENT

Regulation 24(1) Electricity Industry (Enforcement) Regulations 2010

DATED:

BETWEEN:

- (1) Transpower New Zealand Limited as the grid owner of 22 Boulcott Street, Wellington.
- (2) Transpower New Zealand Limited as the system operator of 22 Boulcott Street, Wellington.
- (3) Meridian Energy Limited (Meridian) of 33 Customhouse Quay, Wellington.

(Collectively the **parties**.)

BACKGROUND:

- (A) On 12 April 2018, the grid owner reported to the Electricity Authority (Authority) that it had breached clause 2(1)(b) of Technical Code A of Schedule 8.3 of the Electricity Industry Participation Code 2010 (Code).
- (B) Clause 2(1)(b) of Technical Code A of Schedule 8.3 requires asset owners to ensure their assets, in the manner in which they are designed and operated, are capable of being operated, and operate, within the limits stated in the asset capability statement (ACS) provided to the system operator.
- (C) On 28 June 2018, the Authority appointed an investigator under regulation 12 of the Electricity Industry (Enforcement) Regulations 2010 (Regulations), to investigate the Alleged Breach by the grid owner.
- (D) The system operator and Meridian joined the investigation as interested participants.
- (E) The parties have agreed to settle the Alleged Breach on the terms contained in this Agreement.

IT IS AGREED:

1. Interpretation

1.1 In this Agreement, unless the context requires otherwise:

- (a) **Agreement** means this Settlement Agreement;
- (b) **Alleged Breach** means the alleged breach of the Code arising from the Circumstances and described in clause 2;

- (c) **Approval Date** means the date the parties to this Agreement are notified that the Electricity Authority has approved this Agreement under regulation 24(4) of the Regulations;
- (d) **Circumstances** means the circumstances set out in clause 3;
- (e) **Code** means the Electricity Industry Participation Code 2010;
- (f) **Regulations** means the Electricity Industry (Enforcement) Regulations 2010.

2. Alleged Breach

- 2.1 It was alleged that the grid owner breached clause 2(1)(b) of Technical Code A of Schedule 8.3 from 12 August 2017 to 3 April 2018, when it failed to ensure that the HVDC operated within the limits of the ACS that it had provided to the system operator.

3. Circumstances of the Breach

- 3.1 In November 2016, the grid owner changed the HVDC control system to increase the short time overload capability of Pole 2 to 700 MW. This change required Pole 2 to be limited to a 1,200 A pre-event¹ to enable a 15 minute post event overload limit of 2,000 A if Pole 3 tripped.
- 3.2 The HVDC link can be switched to a reduced voltage mode² to assist the system operator to manage high voltages in the AC network. When reduced voltage mode is selected on either Pole 2 or Pole 3, the single cable current limit is automatically set to 4,000 A. Once reduced voltage mode operation is no longer required, normal voltage mode is selected. The grid owner then manually resets the single cable current limit to its normal value of 1,200 A.
- 3.3 In the HVDC SCADA system, the grid owner can set the current as either:
 - (a) a single cable current limit introduced in November 2016 (normal dispatchable maximum transfer); or
 - (b) an absolute current limit for each pole used for limiting transfer in all circumstances.
- 3.4 On 12 August 2017, the grid owner switched the HVDC from reduced voltage to normal voltage. Inadvertently, the grid owner applied 1,200 A to the Pole 2 absolute current limit setting instead of the single cable current limit setting.
- 3.5 On 3 April 2018, the grid owner discovered the error and immediately applied the correct single cable setting.

¹ The 1,200 A pre-event limit allows for a maximum transfer of 420 MW. The 2,000 A limit is the short time overload capability and allows for a transfer of 700 MW.

² Normal voltage mode is 350 kV and reduced voltage mode is 250 kV.

4. Impact of the Breach

- 4.1 The impact of the breach was the system operator relied on the overload limits in the ACS. As a result, at times when the HVDC was transferring electricity north, the system operator did not procure sufficient reserves to cover the actual risk of Pole 3 tripping.
- 4.2 For 783 trading periods between August 2017 and April 2018, the power system was placed at risk as a result of the system operator purchasing insufficient reserves. If Pole 3 had tripped, Pole 2 would not have been able to deliver the expected 15 minute overload capability of 700 MW.
- 4.3 In the worst case scenario, if Pole 3 had tripped this would have tripped the first block of AUFLS.

5. Steps taken to prevent recurrence

- 5.1 The grid owner commissioned an investigation into the event using the incident cause analysis methodology (ICAM). The investigation team included an external lead investigator and grid owner staff. The investigation report was completed on 1 June 2018 and involved:
 - (a) gathering the facts
 - (b) investigating the frequency of the HVDC setting process
 - (c) investigating contributing factors
 - (d) determining the root causes and proposing recommendations.
- 5.2 The ICAM report proposed the following seven recommendations. The ICAM report named the person responsible and a completion date for each recommendation.
 - 1. Investigate the automatic resetting of the single cable current limit (SCCL) following return to nominal voltage.
 - 2. Build, publish, and train staff on:
 - A formal procedure for setting nominal voltage on either pole (or both poles) which includes resetting the SCCL as an integral part of the entire process
 - a set of standard terms for HVDC controls, eg, SCCL.
 - 3. Adopt a formal change control process for the HVDC, including HVDC SCADA, that ensures new processes and procedures are developed, and all HVDC training material and tools are updated and staff are trained.
 - 4. Review and formalise National Grid Operating Centre HVDC training and assessment processes.

5. Review National Grid Operating Centre and National Control Centre operating protocols.
 6. Investigate the effectiveness of National Grid Operating Centre internal auditing in improving logging practices and incident reporting.
 7. Review National Grid Operating Centre SCADA HVDC analogues for feasibility to include Pole current limits and single cable overload scheme required for confirmation of National Control Centre operational instructions.
- 5.3 Transpower also commissioned an independent reviewer to interview staff to discover any wider factors relevant to the HVDC current limit setting and similar events. Transpower has recently received the report and is considering the report's recommendations and its response.

6. Settlement

- 6.1 The grid owner agrees to:
- (a) implement the seven recommendations in the ICAM³ report and confirm to the parties to the investigation that this has been done
 - (b) provide the Authority with a copy of the independent reviewer report and Transpower's responses to that report.

7. Confidentiality

- 7.1 If the Authority decides under regulation 25(2) of the Regulations not to publicise any part of this Agreement, each party will treat that part of the Agreement as confidential information and will not disclose it other than:
- (a) to the party's employees or contractors who need to know the confidential information to implement or monitor the implementation of this Agreement;
 - (b) to the party's professional advisers, auditors and bankers;
 - (c) as required by law or for the purposes of judicial proceedings;
 - (d) as required by any securities exchange or regulatory or governmental body to which the party is subject or submits; or
 - (e) as authorised in writing by the other parties.
- 7.2 A party must not disclose confidential information under clause 7.1(1)(a) or (b) unless the party obtains a confidentiality undertaking from the person to whom the confidential information is to be disclosed on terms no less onerous than those set out in this clause 7 before disclosing the confidential information. Any confidential information to be disclosed in the circumstances set out in

³ The parties to the investigation received a redacted copy of the ICAM report as part of the settlement process

clause 7.1(c) or (d) may only be disclosed after written notice to the other parties (unless the disclosing party is prevented from notifying the other parties by law).

8. Agreement Subject to Approval

- 8.1 Subject to clause 8.2, this Agreement will come into effect on the Approval Date.
- 8.2 Clause 7 is binding on the parties as from the date of this Agreement. Pending the Authority's approval of this Agreement under regulation 24(4) of the Regulations, clause 7 will apply as if the Authority has decided under regulation 25(2) of the Regulations not to publicise any part of this Agreement or the existence of this Agreement.

9. Settled Breaches

- 9.1 This Agreement is in full and final settlement of all claims, actions and demands against any party (under the Regulations, the Code or otherwise) in relation to:
- (a) the Alleged Breach; and
 - (b) any other breaches of the Regulations or Code involved in or arising from the Circumstances that the claiming party ought reasonably to have known about at the date of this Agreement.

(the Alleged Breach and such other breaches together the **Settled Breaches**).

- 9.2 Subject to regulation 26 of the Regulations, this Agreement is also binding on the Authority and all participants who are not a party to this Agreement to the effect that:
- (a) the Authority may not, on its own initiative, instigate a further breach investigation, or take any enforcement action in respect of, the Settled Breaches; and
 - (b) a participant who is not a party to this Agreement may, in accordance with regulation 26 of the Regulations, make a further notification under regulation 7 or 8 of the Regulations in relation to a Settled Breach, and the Authority may then take all or any of the steps provided for in the Regulations despite this Agreement.

10. General

- 10.1 Each party will execute all documents and do, or refrain from doing, all other reasonable things necessary or desirable to give full effect to the provisions of this Agreement, including to secure the Authority's approval of this Agreement under regulation 24(4)(a) of the Regulations.

10.2 This Agreement is the whole and only agreement between the parties relating to the settlement of claims, actions and demands arising from the Circumstances. Each party acknowledges that it has not been induced to enter into this Agreement by any representation made by or on behalf of the other party that is not repeated in this Agreement.

10.3 This Agreement may be signed in any number of counterparts.

SIGNED:

For Transpower New Zealand Limited as the
grid owner

Name:

Position:

SIGNED:

For Transpower New Zealand Limited as the
system operator

Name:

Position:

SIGNED:

For Meridian Energy Limited

Name:

Position: