

# **Information Guide Burdening of Transformers**

**Version 2.1**



## Version control

Version	Date amended	Comments
1.0	17 January 2007	Creation and publication of information paper.
2.0	11 November 2008	Updated into the Commission's new format.
2.1	1 November 2010	Updated for transition to Electricity Authority.



## Overview

This information paper outlines the outcome from the rules review regarding the burdening of transformers issue, completed by the Code of Practice (COP) D5 Review Panel and approved by Electricity Commission Board.

The general approach set out in this information guide in no way reduces the requirement upon participants to know and comply with their obligations under the Electricity Industry Participation Code 2010 (Code). Neither should it be interpreted as reflecting the Electricity Authority's (Authority) view on the Code.



## **Glossary of abbreviations and terms**

<b>Authority</b>	Electricity Authority
<b>Code</b>	Electricity Industry Participation Code 2010
<b>CTs</b>	current transformers
<b>VT</b>	voltage transformers



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## Background

1. The burdening of transformers issue originally arose at a test house conference, where participants saw a need for an obligation to compulsorily burden voltage transformers (VT).
2. The Code requires all measuring transformers to meet particular standards. In particular Table 2 of Appendix 1 of Code of Practice 10.3 of Schedule 10.1 states that:

**Table 2: Measuring transformers**

Measuring transformers must be designed and manufactured generally to the following standards and must be tested to the relevant part of those Standards. The **approved test house** must inspect manufacturer's test certificates and carry out whatever additional tests it considers necessary to satisfy itself that the measuring transformers and **metering installation** meet the accuracy requirements of this Code.

## Recommended approach

3. The COPD5 Review Panel's (Panel) recommended action is that where a test house determines that a transformer is operating outside its design parameters, and has an error of sufficient magnitude that correction is required, the choices are:
  - (a) application of a suitable burden to ensure that the transformer is operating within its linear transfer curve, as determined by the standards to which it was constructed, or to a standard that would generally be considered to apply to that transformer at the time of its initial installation or manufacture; or
  - (b) application of a correction factor to the metering information or raw meter data that will effect a correction to the error, where application of a burden resistor is not deemed appropriate by the test house.
4. Where the error is corrected by the application of an error correction factor, and the reason for the error correction is to compensate for the transformer operation outside the linear transfer portion of its operating curve (under burdened), the certifying test house has two methods of compliance. These are:
  - (a) under clause 4(6) to (10) of Code of Practice 10.3 of Schedule 10.1 of the Code (departure from requirements), the reason must be given when the certification is applied, and the Panel can monitor the activities and the overall compliance trends associated with these activities; or
  - (b) under Code of Practice 10.5 of Schedule 10.1 of the Code (variation of requirements), this variation can also be accommodated. In this case the Panel will also be in a position to monitor the long-term compliance issues of this activity.

## Issues for further consideration

5. A significant concern of the Panel is the longevity of any error correction factor that is implemented by way of a data correction multiplier when these installations switch retailer (and data administrator) on a regular basis, and where meters are replaced.
6. Presently the issue is not discoverable, and the extent of the application of data correction factors is not easily determinable. The clarification of the intent and application of the Code as outlined above will ensure that this issue is transparent in the future, and any change to the Code that may eventually be required can be implemented with the clarity of current practices.

## Summary

7. In applying the Code there is no immediate change to the Code required to ensure that the issue of VT burdening is managed in a way that ensures ongoing integrity of the accuracy of the metering installation.
8. The Code refers to all measuring transformers. All measuring transformers would include both current and voltage transformers. As current transformers (CT) form an integral part of the overall metering installation the inclusion of CTs in this Code clarification will also be of benefit as their accuracy can be affected by under-burdening.

## Sources of information

9. The Code can be found on the Authority's website at:  
<http://www.ea.govt.nz/act-code-regs/code-regs/the-code>
10. If you require any additional information on the burdening of transformers, please contact the Market administrator:

Electricity Authority  
PO Box 10041  
Wellington  
Attention: Market Administrator

Telephone: 04 460 8860  
Fax: 04 460 8879  
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