

MEP & ATH Forum

Burdening of current transformers

08 February 2017, Wellington
Brett Piskulic
Veritek

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History

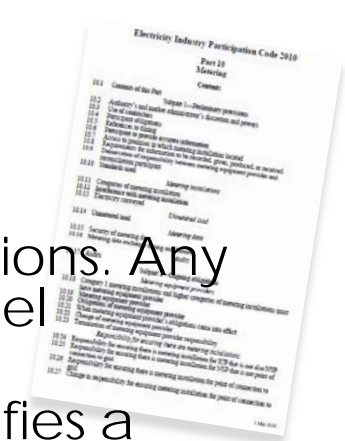
Prior to the rollout of electronic meters CT metered installations may have incorporated multiple electromechanical devices which imposed high burdens on the CTs. CTs were specified to meet these higher burdens, often these were rated at 10, 15VA+.



The replacement of these devices with a single electronic meter has led to a reduction of the in-service burden of the installations. However there are a number of the older CTs still in service with higher rated burden.

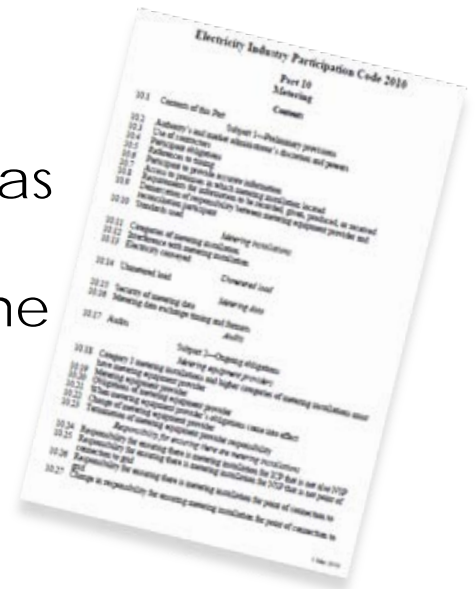
Measuring transformer burden – Code Requirements

- Part 10 Clause 19 - Modification of metering installations. Any change to the burdening of a transformer will cancel installation certification.
- Schedule 10.7 28 (4) (i) - An ATH must, before it certifies a metering installation incorporating a measuring transformer ensure that the total burden does not exceed the nameplate rating or a lower rating specified by the design report.
- Schedule 10.7 31 Measuring transformer burden and compensation requirements
 - (7) An ATH must, before it certifies a measuring transformer, if the in-service burden is less than the lowest burden test point specified in a standard set out in Table 5 of Schedule 10.1,
 - (a) install burdening resistors to increase the in-service burden to be equal to or greater than the lowest test point specified in the standard; or



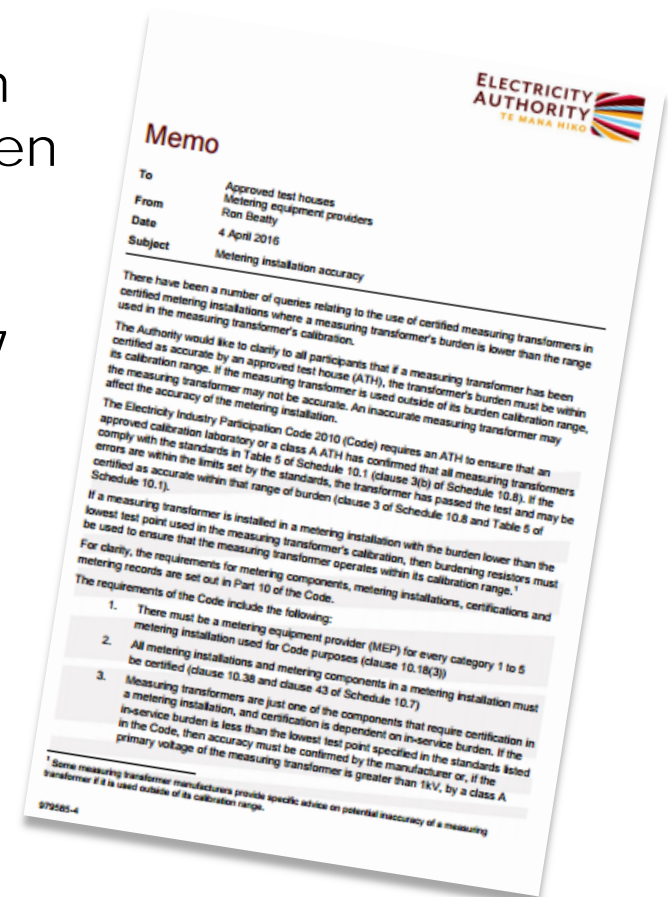
Measuring transformer burden – Code Requirements

- (b) confirm that—
- (i) a class A ATH has confirmed by calibration that the accuracy of the measuring transformer will not be adversely affected by the in-service burden being less than the lowest burden test point specified in the standard; or
- (ii) the measuring transformer's manufacturer has confirmed that the accuracy of the metering transformer will not be adversely affected by the in-service burden being less than the lowest burden test point specified in the standard.



Measuring transformer burden – EA Memo

- The EA issued a Memo on 4th April 2016 regarding burdening of measuring transformers. The memo states that an ATH must consider the in-service burden of measuring transformers when certifying an installation.
- The memo also refers to schedule 10.7 clause 21. The error of a metering installation must not exceed the maximum permitted error set out in Table 1 of Schedule 10.1.



What is the effect of under or over burdening CTs?

- Some CTs may be inaccurate when either under or over burdened.



How can ATHs meet burdening Requirements

- To meet this requirement, first the onsite burden must be determined.
- How is burden measured on-site?
- Typical example:

Voltage at CT terminals measured (V_{sec})

Current in CT secondary measured (I_{sec})

Calculate expected burden at rated burden

Burden @ prevailing current $VA = I_{sec} \times V_{sec}$

Resistance at prevailing current $R = \frac{V_{sec}}{I_{sec}}$

Burden @ rated current = $I_{rated}^2 \times R$

- Is this appropriate?

How can ATHs meet burdening Requirements

- By adding burden when required?
 - Increase length of secondary circuits
 - Decrease cross sectional area of secondary conductors
 - Add burdening resistors
- By confirming accuracy of CTs at lower burden test points as per Schedule 10.7 31
 - If testing can confirm the accuracy of the CTs at lower burdens the ATH may certify. Some testing has been done which indicates that some CTS perform ok at some tappings while not at others. In these cases the ATH may need to re-tap the CTs.



Difficulties for ATHs

- When certifying a CT in a lab situation prior to installation the ATH does not have visibility or control of the in-service burden.
- Does an ATH need to consider the in-service burden when using the Comparative Re-certification method on a Cat-2 installation?



Recommendations

- Ensure that ATHs have appropriate procedures and equipment for determining in-service burden
- Ensure all ATH field personnel understand the CT burdening requirements.
- Ensure appropriate means for applying burden is available when required.
- Review practices to ensure they are compliant.