RITZ INSTRUMENT TRANSFORMERS, INC.

Medium-Voltage Extended-Range Current Transformers

HOW MUCH REVENUE IS YOUR COMPANY LOSING DUE TO INCORRECTLY SIZED CTS?

You have a metering point with a maximum expected current of 300A… you buy a 300:5 A CT.

Right?

Wrong

The IEEE 0.3 metering class is defined such that 0.3% performance is only guaranteed from the rated current up to the maximum continuous current (rating factor x rated current). The 0.3 class then also specifies that the accuracy performance down to 10% of rated current be 0.6%. Below 10% of rated, the accuracy is not defined.

Therefore, the correct way to size conventional CT's is to use the rating factor to cover the maximum current of the load and size the ratio as low as possible to ensure an accuracy performance of 0.3% across as much of the load spectrum as possible. For an installation with a maximum current of 300A, this would mean that if a CT with a rating factor of 3.0 is purchased, the ratio could be 100:5A and still cover the maximum current.

Here is the problem…for primary metered customers, it is common for the load during off peak-hours and weekends to be 5% or less of what the rated current of the CT is. If the load is 5% of the rated current of the CT, what's the accuracy performance of the CT at the point?

UNDEFINED…You don't know.

As the current gets lower, most CT's error performance drifts more and more negative. That's more and more in your customer's favor, or in other terms, less and less income for your utility. At currents lower than 5% of rated current, the error of most CT's can be -1% to -3% or worse. Clearly, if you want better performing CT's, you need to buy units designed to outperform the IEEE 0.3 metering class. To answer this metering challenge, Ritz has designed an Extended-Range Current Transformer for Medium-Voltage applications (MV ERCT) at 15 kV through to 69 kV utilizing the state-of-the-art Dynalloy core material to achieve accuracies and current ranges that are unmatched in the industry.

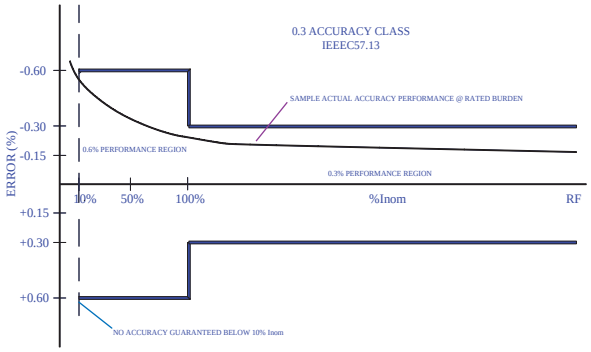
The MV ERCT's have an accuracy performance of 0.15% for standard burdens up through B1.8 (1.8 ohms). The accuracy rating is applicable from 1% of rated current through to 150% of rated current and is available in standard ratios of 200:5A,1000:5A, or 2000:5A, depending upon design. Other non-standard ratios are also available upon request.

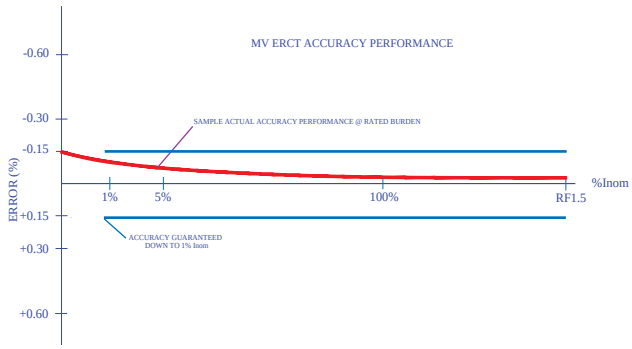
The following is an example of how much income can be increased by applying the 200:5A MV ERCT to a typical metering point:

Load Profile:
2242 kW (100 A) for 16 hours on weekdays
224 kW (10 A) for 8 hours on weekdays and on weekends
Rating of Service Transformer: 5 MVA (200A maximum)
Existing CT Rating: 200:5A, 0.3B1.8 RF 1.5
System: 4-wire, 3-phase, 14,400 V
Line Power Factor: 0.9 lagging
Price of Electricity: $0.08/kWh

Per IEEE, the 0.3 class defines the performance from rated current (200A) to the rating factor (300A) to be 0.3% and then 0.6% performance down to 10% rated current (20A in this case). Since the load of 10A is below any defined level for the IEEE metering class, we'll assume that the CT error is 1% to the customer's favor, which is conservative.

Since most CT's error at rated currents and below are negative ratio errors (in the customer's favor), for the times when the customer load is 100A, the ERCT would offer an accuracy limit improvement of 0.45% (0.6%- 0.15%) and a limit improvement of 0.85% (1% - 0.15%) when the load is at 10A. Working out the math, the ERCT could allow a utility to accurately bill for an additional 50,682 kWh/year, which corresponds to $4,054/year added revenue.





How much revenue are you losing due to load conditions changing on existing metering points?

Do you confirm your existing primary metering CTs are sized correctly on a regular basis? If the answer is no, then chances are that some of your primary metering CTs are no longer sized correctly, likely resulting in lost revenue for your company.

It is common for primary metered installations to change over time, sometimes resulting in a dramatic reduction in load currents. With conventional CTs, unless the ratio is changed accordingly, then revenue errors can be substantial.

By using MV ERCTs as a standard practice, such a change in load conditions normally will not result in operation outside of the 0.15% performance area.

How much is your CT inventory costing to hold and is it adequate?

By switching to MV ERCTs, customers can greatly reduce the number of different CTs needed in inventory per voltage class to respond to quick schedules and customer outages, while also improving the metering performance of installs.

Typically, one MV ERCT type per voltage class can sufficiently handle 80-90% of meter points on a utility's system.

Also, the use of MV ERCTs allows primary meter sets to be made without knowing the specifics of the metering point, since the accurate range of MV ERCTs is so wide.

GIFU15-01LER
15 kV, 110 kV BIL
0.15B1.8 1% to 150% Inom
200:5A - cat# 112026103.149030
1000:5A - cat# 112026103.149031

GIFU25-03ER
25 kV, 150 kV BIL
0.15B1.8 1% to 150% Inom
200:5A - cat# 112026103.149109
1000:5A - cat# 112026103.149110

GIFD25-03ER
15kV/25 kV, 150 kV BIL
0.15B1.8 1% to 150% Inom
1000:5A - cat# 112053003.05525
2000:5A - cat# 112053003.05526

GIFS36-55ER
34.5 kV, 200 kV BIL
0.15B1.8 1% to 150% Inom
200:5A - cat# 113026055.79155
1000:5A - cat# 113026055.79154

GIF48-58ER
46 kV, 250 kV BIL
0.15B1.8 1% to 150% Inom
200:5A - cat# 114526058.79157
1000:5A - cat# 114526058.79156

GIF72-68ER
69 kV, 350 kV BIL
0.15B1.8 1% to 150% Inom
200:5A - cat# 116026068.79159
1000:5A - cat# 116026068.79158

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