

High Accuracy Instrument Transformers

March 8, 2005
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- ❑ IEEE has developed a new standard for **High Accuracy Instrument Transformers**
 - ✓ IEEE PC57.13.6/D3 DRAFT published Oct. 21, 2004

- ❑ It defines two new ANSI classes for Current Transformers:
 - ✓ **0.15S** class maintains 0.15% accuracy from 5% rated current to 100% rated current * RF
(“S” designation based on IEC Convention for “Special Application”)

 - ✓ **0.15** class maintains 0.3% accuracy at 5% rated current and 0.15% accuracy at 100% * RF

- ❑ Target date for IEEE final publication Dec. 31, 2005

- ❑ Manufacturers of medium and transmission class ITx offer devices built to IEEE PC57.13.6/D3 standard today

- ❑ CSA formed a technical working group in January, 2004 to update the CAN3-C13.M83 Instrument Transformer Standard
- ❑ Working group members include most provincial transmitters, Measurement Canada, and several Canadian ITx manufacturers
- ❑ Canadian input was used to update the IEC series of ITx standards in 2000 to 2002
- ❑ CSA proposed adopting the IEC ITx standards with a covering section of “Canadian Deviations” that recognize North American conventions
- ❑ Canadian Deviations developed from January to May 2004 and were published to working group members for comment in July, 2004
- ❑ IESO joined the CSA working group in January, 2005
- ❑ Target date for publication of new series (CSA-C60044-x) of CSA Instrument Transformer Standards is June 30, 2006
- ❑ Measurement Canada expected to recognize the new CSA ITx Standards to replace existing references to CAN3-C13.M83 within LMB-EG-07 “*Specification for Approval of Type of Electricity Meters, Instrument Transformers and Auxiliary Devices*”

Reason for IESO Involvement

- ❑ Government of Ontario recent RFP for Renewable Energy has resulted in rapid development of new wind based generation
- ❑ Limited experience to date in Ontario with revenue metering for large scale wind farm developments
- ❑ Academic information available for “typical” wind farm installations indicates a very wide dynamic operating range
 - ✓ 75% of annual hours - aggregated output of wind farm can vary from 0 to 100% of theoretical nameplate rating * number of installed generators
 - ✓ 25% of annual hours “taking load” at minimal levels for SCADA / auxiliary heaters
- ❑ IESO working with wind farm MMPs and MSPs to encourage:
 - 0.15S class CTs with factory accuracy test results at 1% of rated current
 - Lower nominal CT ratio with higher Continuous Current Rating Factor (typically 2.0, 3.0, or even 4.0 if commercially available)
- ❑ Additional applications possible for legacy wholesale GS installations with over-sized CTs

- ❑ IESO has recommended the following addition in **red** to the current draft of the Canadian Deviations for “CSA –C60044-1 Instrument Transformers – Part 1: Current Transformers”

Table I
Accuracy Classes and Corresponding Limits of Transformer Correction Factors for Measuring Current Transformers (1)

Measuring Accuracy Classes	Limits of Transformer Correction Factor								Limits of Power Factor (Lag) of Metered Power Load
	100% Rated Current (2)		10% Rated Current		5% Rated Current		1% Rated Current		
0.15	0.9985	1.0015	-	-	0.997	1.003	0.994	1.006	0.6-1
0.15S	0.9985	1.0015	-	-	0.9985	1.0015	0.997	1.003	0.6-1
0.3	0.997	1.003	0.994	1.006	-	-	-	-	0.6-1
0.6	0.994	1.006	0.988	1.012	-	-	-	-	0.6-1
1.2	0.988	1.012	0.976	1.024	-	-	-	-	0.6-1

Note 1 : See Figure A

Note 2: These limits also apply at the maximum continuous current rating factor (RF)

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Questions ?