ISO/RTO Metering Standards

Metering Task Force – Session 1

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Business Practice Manual – Market Settlements Manual 005

- 2.10.3 Metering Accuracy
- Each MP is responsible for procuring, installing, and maintaining metering equipment that provides accurate meter data in accordance with applicable American National Standards Institute (ANSI) Code for Electrical Metering minimum standards. Current transformers and voltage transformers used for metering are required to meet or exceed an accuracy class of 0.3%. Metering equipment required for MISO transactions do not supersede more restrictive or specific standards as dictated by the MP's local or state regulatory jurisdictional requirements.

NYISO Control Center Requirements Manual

- 2.2. All devices used in an operational metering system should conform to applicable IEEE standards. These devices include relays, transducers, current transformers, potential transformers, Remote Terminal Units (RTU.)
- 2.3. New meter installations should meet or exceed a full-scale accuracy of 5% as measured at the NYISO or Transmission Owner control room.

NYISO Metering Standards - Revenue

- Guide for Uniform Practices in Revenue Quality Metering*
- 3.1 All CT's should conform to the ANSI standard accuracy class for metering service of 0.3 or better and shall be provided with certificates of test stipulating the ratio and phase angle corrections at 10% and 100% of rating with the standard ANSI burden nearest to the actual "inservice" burden.
- 4.1 All VT's should conform to the ANSI standard accuracy class for metering service of 0.3 or better and be provided with certificates of test stipulating the ratio and phase angle corrections at 100% rating with zero burden and with the rated maximum standard burden.
- 4.9 VT's should be of a wound or cascade type. Coupling capacitor voltage transformers (CCVT's)should not be used for revenue metering purposes.

*These standards are also found in the NYISO Revenue Metering Requirements Manual, Section 2.2

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- Section 3.2.3.1 End Use Meter Standards
  - All metering is of a revenue class metering accuracy in accordance with the ANSI C12 standards on metering and any other requirements of the relevant UDC or Local Regulatory Authority that apply. Such requirements apply to meters, current transformers and potential transformers, and associated wiring and equipment.

CAISO Metering Standards. Cont.

Attachment B1 – Standards for Existing Metering Facilities

- Existing metering facilities are those facilities that were fully installed as of the CAISO Operations Date. Existing Metering Facilities used by CAISO Metered Entities shall meet the following general standards:
- Revenue quality instrument transformers at the generator output level (specifically at all main generators, banks and local distribution load supplied from the generator) must have an accuracy of 0.3% or better,
- Generator auxiliary load metering must have an overall accuracy of 3% or better
- Revenue quality instrument transformers at transmission metering points must have an accuracy of plus or minus 0.3% or better.
- Note: Any modifications to Existing Metering Facilities are required to meet the standards outlined in Section B2.

B2 - General Standards for CAISO Meters

- New meters are those meters that are installed after the CAISO Operations Date. Meters must meet the following general standards:
- They must be revenue quality with a 0.2 Accuracy Class

Exhibit B-1: 9 Accuracy

- B-1: 9.1 ANSI C12.10
  - The meter meets or exceeds the accuracy specifications contained in ANSI C12.10 over its entire service life without the need for adjustment.
- B-1: 9.2 Factory Calibration
  - The meter is calibrated to provide the following level of accuracy:

    (a) ± 0.2% at full load at power factor of 100%;

    (b) ± 0.25% at full load at power factor of 50% lag;

    (c) ± 0.25% at full load power factor at 50% lead; and

    (d) ± 0.25% at light load at power factor of 100%.

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Section 5.5 – Data Validation

- All telemetry data reported via the RIG (Remote Intelligence Gateway) must be within +/-2% of the true value.
- The CAISO or its designee may inspect the resource owner's RIG and related facilities to verify the accuracy and validity of all data telemetry to the CAISO. The CAISO reserves the right to periodically audit and re-verify the accuracy and validity of all telemetry data. In addition, the CAISO's verification activities will be coordinated with the resource owner at least 24 hours in advance

Commercial Operations: Settlement Metering Operating Guides

Section 8 ACCURACY STANDARDS

– Accuracy Class

- EPS Meters with production or load equal to or greater than 10 MW at the metering point shall meet or exceed the accuracy specifications contained in ANSI C12.20, 0.2 Accuracy Class.
- EPS Meters with production or load less than 10 MW at the metering point shall meet or exceed the accuracy specifications contained in ANSI C12.1.
- Attachment D2 - Existing meters with an accuracy class outside 0.2% may be used as long as the meter accuracy level can be maintained at ±0.15% maximum allowable tolerance as defined in these Settlement Metering Guides.

Section 5 – Specifications:

- Accuracy (Wire Wound)

- All current transformers shall have an accuracy of:
  - Standard – 0.3% accuracy class; or
- Optional – 0.15 % accuracy class

- Accuracy and burden (Fiber Optic System)

- All fiber optic CT metering systems shall have an accuracy and burden of:
  - Standard – shall meet the 0.3% accuracy class standards for wire wound current transformers, ensuring that fiber connection is maintained within manufacturer's prescribed limits. (This recognizes that optical units have an accuracy range closer to 0.15% from 5% to nominal current rating.) Connected burden shall not exceed the burden rating of the system.

- Section 5 – Specifications, Cont:
  - **Accuracy**
- All voltage transformers shall have accuracy of:
  - Standard – 0.3% accuracy class; or
  - Optional – 0.15% accuracy class.

Summary

- In summary:
  - CAISO requires 3% accuracy for non revenue metering and +/- 2% for DNP.
  - NYISO states that all new meters must be at 5% accuracy or better.
  - All neighboring RTO/ISO adhere to the ANSI C12 standards and require .3% accuracy for revenue quality metering.