IEEE Std C37.20.2b-1994
(Supplement to IEEE Std C37.20.2-1993)

Supplement to IEEE Standard for Metal-Clad and Station-Type Cubicle Switchgear: Current Transformer Accuracies

Sponsor

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Abstract: Metal-enclosed medium voltage switchgear (ME), which can contain either drawout electrically operated circuit breakers or stationary electrically operated circuit breakers in individual three-pole grounded metal compartments, is covered. Further, metal-clad switchgear (MC) is compartmentalized to isolate all components such as instrumentation, main bus, and both incoming and outgoing connections with grounded metal barriers. Rated maximum voltage levels for metal-clad switchgear (MC) range from 5 kV through 38 kV with main bus continuous current ratings of 1200 A, 2000 A, and 3000 A. Rated maximum voltage levels for station-type cubicle switchgear (SC) range from 15.5 kV through 72.5 kV with main bus continuous current ratings of 2000 A, 3000 A, 4000 A, and 5000 A. ME switchgear also contains associated control, instruments, metering, relaying, protective, and regulating devices as necessary. Service conditions, ratings, temperature limitations, and classification of insulating materials, insulation (dielectric) withstand voltage requirements, test procedures, and application are discussed.

Keywords: common or related terms, control, cumulative loading, cubicle switchgear, current transformers, drawout, indoor, instrumentation, load current-carrying, metal-clad switchgear (MC), metal-enclosed power switchgear (ME), metering, outdoor, protection, qualifying terms, stationary, station-type cubicle switchgear, switchgear assemblies, transformer accuracy, voltage transformers

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*Replace **table 5** on page 13 of IEEE Std C37.20.2-1993 with the following:*

Table 5—Standard accuracy class ratings[a]
Current transformers in MC switchgear

Metering accuracy at 60 Hz standard burdens						
Ratio	**B0.1**	**B0.2**	**B0.5**	**B0.9[c]**	**B1.8[c]**	**Relaying accuracy[d]**
50:5	1.2	2.4[b]	—	—	—	C or T 10
75:5	1.2	2.4[b]	—	—	—	C or T 10
100:5	1.2	2.4[b]	—	—	—	C or T 10
150:5	0.6	1.2	2.4[b]	—	—	C or T 20
200:5	0.6	1.2	2.4[b]	—	—	C or T 20
300:5	0.6	1.2	2.4[b]	2.4[b]	—	C or T 20
400:5	0.3	0.6	1.2	1.2	2.4[b]	C or T 50
600:5	0.3	0.3	0.3	1.2	2.4[b]	C or T 50
800:5	0.3	0.3	0.3	0.6	1.2	C or T 50
1200:5	0.3	0.3	0.3	0.3	0.3	C 100
1500:5	0.3	0.3	0.3	0.3	0.3	C 100
2000:5	0.3	0.3	0.3	0.3	0.3	C 100
3000:5	0.3	0.3	0.3	0.3	0.3	C 100
4000:5	0.3	0.3	0.3	0.3	0.3	C 100

[a] See IEEE Std C57.13-1993.
[b] This metering accuracy is not in IEEE Std C57.13-1993.
[c] Note that these were formerly standard burdens of B1.0 and B2.0, respectively, which are now classified as relaying burdens in IEEE Std C57.13-1993.
[d] These accuracies may not be sufficient for proper relaying performance under all conditions. To ensure proper relaying performance, the user should make a careful analysis of ct performance considering the relaying requirements for the specific short-circuited currents and secondary circuit impedances (see 7.7.1.1).

*On page 45, add **7.7.1.1** as follows:*

7.7.1.1 Current transformer ratios

Before selecting a ct ratio, careful review and coordination of the following factors are necessary:

— available fault current
— rated full load current
— accuracy class
— ct burden

The following two sets of ct's may be required:

a) A low ratio set determined by the rated full load current and overload relaying requirements
b) A much higher ration/accuracy class combination set dictated by the short-circuit current levels and the ct secondary burden

Failure to coordinate ct ratio and accuracy class properly with available short-circuit current and ct secondary burden may result in ct saturation and nonoperation or misoperation of the relay.

The problems and related solutions of applying low ratio ct's in high fault current circuits have been documented in "Relay Performance Considerations with Low Ratio CT's and High Fault Currents," *IEEE Transactions on Power Delivery,* vol. 8, issue no. 3, pp. 884–897, July 1993.