

IEEE Standards Interpretation for C57.12.00™-2000 Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

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Interpretation Request #1

Topic: Conflictive Situation **Relevant Clauses:** 4.1.6.1

The plant we have built up has two 2.500 KVA 13, 2-4, 16 kV transformers with +1- 2, 5- 5% taps under IEEE/ANSI. The voltage of the line is now between 13, .75-14.2 KV.

Our Customer understands that point 4.1.6.1 allows a +5% over voltage in any tap position for the transformers. They interpret IEEE Std C57.12.00 subclause 4.1.6.1 as if we could have a +5% margin in voltage in any tap, which means that if we have our transformers working in tap 1 = +5% , we could load the unit with a primary voltage up to 14.537 V. In fact they consider the 4.16 kv nominal voltage in the secondary, they increase this value in 5% making 4.368 kv ; they multiply this value by 3.328 that is the maximum transf. ratio value measured in the tap # 1 of the transformer and they come to the conclusion according to the specs the transformer shall be able to receive 14.537 kv in the primary.

On the contrary, we understand that subclause 4.1.6.1 defines an operation condition that will put the transformer into a maximum load and excitation = maximum heat. That extreme condition could be reach in any tap 0, -2,5% and -5% but never on taps +2, 5 and +5% since this operation conditions will imply that the primary voltage in the line will be over 13.860 volts, defined as limit voltage operation for a 13, 2 Kv system.

Could you please advise if we have the proper understanding of IEEE in this case?

Interpretation Response

IEEE Std C57.12.00-2000 (subclause 4.1.6.1) requires transformers to be suitable for operation, without exceeding temperature rise limits, under the following conditions:

at up to 110% of rated volts and up to 110% rated volts/hertz under no load condition, and;
with secondary winding at up to 105% of rated volts, and up to 105% rated volts/hertz, under full load condition

These requirements apply to all taps. Operation, under load, with primary voltage at 105% of rated tap voltage, for any tap position, is within the requirements of this standard.