

IEEE Standards Interpretation for IEEE Std C57.12.90™-2006 IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers

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Interpretation Request #1

IEEE Std C57.12.90-2006, 10.8.6 failure detection states that 'In terms of interpretation of partial discharge measurements, the results shall be considered acceptable and no further partial discharge tests required under the following conditions: b) The increase in PD levels during the 1 hour period does not exceed 150 pC'. Does this mean that if the starting partial discharge reading compared to the reading after 1 hour is less than 150 pC the test is acceptable even if the values during the test exceed the 150 pC limit? Two examples of test results are included for comparison to the standard.

Interpretation Response

Those experienced with testing transformers, both manufacturer and utility representatives, agree that the purpose of measuring partial discharge during induced testing is to demonstrate that the transformer is partial discharge free at operating voltage. The criteria listed in Clause 10 of IEEE Std C57.12.90-2006, including those for interpretation of partial discharge measurements have been developed over a number of years by several individuals who were and are very experienced in this subject. However, it must be said that the three guiding criteria listed in 10.8.6 do not cover all practical situations. These situations are those where even the test specialists can disagree.

Testing specialists can disagree in their interpretations because of their unique test experiences. In cases of doubt or disagreement between the manufacturer and customer, extra care should be taken to insure that the transformer is partial discharge free.

A reasonable option in both examples presented would be to extend or repeat the test, as suggested in the penultimate paragraph of 10.8.6.

Further, the last paragraph of the 10.8.6 states that failure to meet the acceptance criteria does not warrant immediate rejection, but shall lead to consultation between the manufacturer and the customer about further investigations. Such investigations could include extending or repeating the tests, as suggested above, and this action will normally determine one way or the other the health of the transformer.

It should also be emphasized that decisions regarding the health and integrity of a transformer be made at the time of testing by the manufacturer's and the customer's representatives, not after testing is complete and the transformer has been moved from the test floor. The manufacturer must demonstrate to the customer that the transformer is partial discharge free, and measures should be taken to insure that testing conditions are free of ambient partial discharge at normal operating voltages. If the customer's representative is not satisfied with the test results or the manufacturer's reaction to them, he has the prerogative to reject the tests.