

REWINDING OF A HIGH VOLTAGE MACHINE: TECHNICAL FEATURES AND CRITERIA THAT SHOULD BE IN THE SERVICE SPECIFICATIONS – A PRACTICAL CASE

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The life expectancy of a high-voltage winding depends, necessarily, of an adequate design, acceptance tests and approval of the prototype bars, tests on the manufactured assembly and tests during and after the mounting inside the magnetic core.

Before hiring a company for the repair of a critical HV machine, the user must specify strict conditions to be followed by the service provider. Specifications that are considered “loose” or without the right technical acceptance criteria can lead to the manufacturing of windings and bars of inferior quality, reducing the expected lifecycle of the machine.

There are many standards and tests that can be used as reference during the repair of a HV machine. Some have established criteria and values of acceptance, whereas others are not yet widely agreed upon. The user, when specifying the criteria, must do it with care, in a way that they do not become unattainable or affecting the economic feasibility of the contract, since the contractor must take the risk of meeting the requirements. On the other hand, the criteria can't be too forgiving, so there must be a balance between the cost and quality expected, which will be reached using sensible criteria.

The general acceptance criteria and tests, such as dielectric losses, tip-up, capacitance, hipot, surge test, voltage endurance test, partial discharge, semiconductive coating resistance, sleeve dimensions, distances and spacings of the endwindings, etc should be used for the approval of the prototypes and before/after the mounting of the bars in the magnetic core. Also, the acceptance criteria must be very objective and reference the relevant international standards, with an indication of “pass” / “not-pass”.

The aim of this paper is to discuss the specifications used during the hiring process for the repair of a 13.8 kV synchronous motor and present the results during each phase of the service (prototypes, winding fabrications and assembly on the machine). Also, when possible, the acceptance values will be compared to the ones achieved during repair.