

Deliberation of arc plasma characteristics according to experimental results in a typical gas circuit-breaker

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One of the industrial plasma applications is in the gas circuit breakers (GCB) and switching processes. During GCB operation and opening of its two contacts, current flows through of the inter-electrode medium (generally SF₆ or its mixture) and electric arc forms from the plasma that has been created between the contacts. The electric arc is a self-sustained discharge having low voltage drop and able to support great amplitudes of current [1].

The technical basis of circuit breaker is: initiating arc plasma, flowing a large current, cooling it effectively to avoid re-ignition, and finally the transition from a well-conducting medium into insulating gas space in a very short time interval. In other words, for a successful interruption we need to know about power brought to the arc and that of removed [2].

In this paper an attempt has been made to study, characterize and understand some arc behaviors such as arc conductance and its changes according to recorded current and voltage traces experimentally. From physical point of view, there are different phenomena that affect on arc behavior. According to methodology used here, we tried to understand some of arc behavior from experimental results and finally we extract some arc parameters [3-4].

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