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Investigation of pressure increase in HVDC relays during plasma arcing in short circuit situations¹ CRISPIN EWUNTOMAH, Leuphana University Lneburg, Germany, JENS OBERRATH, University of Applied Science, Soest, Germany — Short circuit situations in high voltage direct current (HVDC) relays often lead to the formation of plasma arcs, which excessively heat and vaporize the contacts of the relays. Consequently, significant pressure is built up in the enclosed chambers of the relays. To quantify the pressure in such situations, a Panasonic AEV14012 relay is investigated both experimentally and numerically using two short circuits currents. Thermal plasma parameters obtained from the numerical model are used to simulate the time dependent increase of pressure within the enclosed chamber of the relay. The results are compared to show the plasma arc formation, time dependent arc evolution and pressure increase. It is established from the results that; the magnitude of the short circuit current influences the rate of vaporization of the contacts and the pressure increase in the enclosed chamber.

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