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3P18 - CALCULATION OF ARC CONDUCTANCE AFFECTED BY FLOW FIELD FOR IMPROVEMENT OF CURRENT INTERRUPTION PERFORMANCE

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Numerical analysis was conducted in order to elucidate the flow field in post arc with applying transient recovery voltage. The objective of this simulation is to elucidate the arc phenomenon inside Gas Circuit Breaker (GCB) in post arc. GCB is an electric power equipment that quenches the arc using the compressed SF_6 gas. It has been reported that the decrement of the arc temperature at current zero point contributes to prevent the re-ignition with applying transient recovery voltage. Thus, it is necessary to elucidate the flow field in GCB for improvement of current interruption performance. Especially, the study of focusing on the flow field has been progressed using numerical analysis in order to elucidate the physical phenomenon in GCB. However, few reports have been studied the focusing on the flow field from center between electrodes to outlet of nozzle. In this paper, the calculation of arc conductance affected by flow field for improvement of current interruption performance is investigated in order to elucidate the behavior of gas flow. The parameter of this simulation is gas blaster angle and nozzle throat length. As a result, the re-ignition occurred with applying transient recovery voltage when the stagnant of SF_6 gas occurs near the outlet of nozzle. Moreover, it was elucidated that the decrement of arc conductance is not always to contribute to arc extinction. On the other hand, the reverse flow to inlet in center between electrodes occurred when the current interruption was successful. For these results, it is suggested that the re-increment of radial flow velocity to axial center near the cathode contributes to the arc extinction. In addition, the reverse flow near the center of arc column promotes the diffusion of heat. Therefore, the flow field plays an important role for improvement of current interruption.

Author: ISHIKAWA, Yuya (Tokyo City University)

Co-authors: KOMAI, Yuji; MAEDA, Yoshifumi (Tokyo City University); IWAO, Toru (Tokyo City University)

Presenter: KOMAI, Yuji

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