Evaluation of Wear Characteristics of C/C Composite Pantograph Contact Strips

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The wear characteristics of copper alloy impregnated C/C composite contact strips were investigated to clarify the dominating wear factors of C/C composite contact strip. In this study, we conducted a series of wear experiments, field tests, and measurement of physical properties of the C/C composite contact strips. The results of the wear experiments indicate that the wear of C/C composite contact strips was proportional to the arc discharge energy. The C/C composite contact strips with high strength carbon fiber were more likely to wear under high arc discharge energy conditions. From the results of the wear experiments, it was found that the wear of C/C composite contact strip was proportional to the electrical current density under lower arc-discharge energy condition. It was also found that the wear of C/C composite contact strip increased significantly when impregnated copper alloy was melt and ejected from the inside of the contact strip. We clarified the relationship between the mechanical strength of C/C composite contact strips and the abrasive wear property of the strips.