

Case Studies in the Failure Analysis of Electrical Equipment

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Abstract

Electrical equipment failures occur frequently, causing supply interruptions and economic loss. To reduce the number of such occurrences, detailed failure analyses must be performed to identify the root causes, so that appropriate solutions may be specified. Successful failure analysis of electrical equipment requires input from various technical disciplines. Metallurgical and material investigations are particularly useful in establishing the mechanisms of failure, whether due to insulation failure leading to flashover, or ohmic heating leading to melting, loss of contact and subsequent flashover. Two case studies illustrating the simple techniques that can be used are presented here. The first case details the damage to a popular make of on-load tap changer (OLTC), caused by ohmic heating of a transition resistor in the tap changing mechanism. The second case involved a different make of OLTC, in which there was a flashover, initiated by tracking over a carbon contaminated insulator surface.