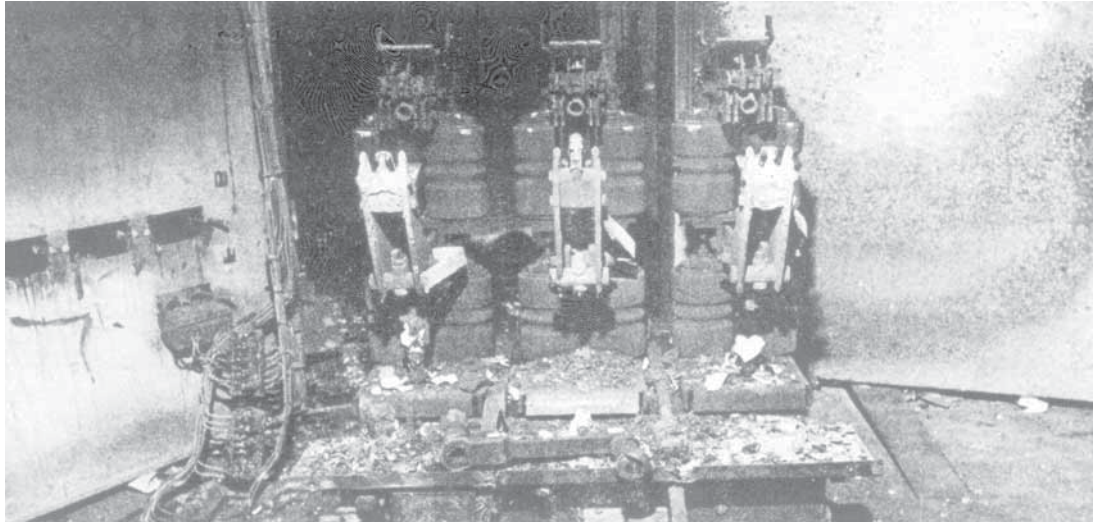


the electrical digest

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Electrical Losses and Claims



Destruction of a 13,800 Volt circuit breaker due to a combination of electrical insulation breakdown as well as fire and arcing.

FIRE . . . vs ARCING

Fire or arcing - the differences between these major causes of electrical fire loss is often stated in millions of dollars. The responsibility for establishing that difference invariably falls on the corporate insurance manager, lawyer or adjuster. Frequently, an independent consulting engineer must in turn make that difficult determination for someone.

The problem is perhaps even more acute in smaller firms not having in-house legal or insurance expertise - or the knowledge of exactly who to consult. Here the dollar savings might mean the difference between resumption and recovery of business - and bankruptcy.

Because of spiralling operating and insurance costs, increasing engineering and legal energies are being expended, segregating causes of electrical fire losses-whether arcing (boiler/machinery coverage) or fires from other electrical causes (fire coverage). The incidence of

fire losses from any cause - including electrical - usually are far greater than those resulting from arcing alone. Insurance rates are proportionately greater.

Some industries place fire insurance with one firm, and boiler/machinery coverage with another, thereby creating the need to establish cause of loss in order to claim. Companies covered by only one insurer for both types of insurance need to be acutely aware of the differences between fire and arcing losses as well.

As an example, Brosz & Associates recently conducted an electrical damage investigation for a company protected by a sole insurer for boiler/machinery as well as fire policies. The firm's fire deductible was \$250,000, while boiler/machinery deductible was \$50,000. The results of the investigation established arcing as the cause, thereby saving the firm some \$200,000.

FIRE vs ARCING (Cont'd.)

In a court case involving an electrical motor, the question of fire versus arcing was presented. Two insurance firms provided fire and boiler/machinery coverage respectively. Evidence provided by experts showed that the motor was damaged initially by an arc, and that fire ensued due to combustible rubber insulation materials in the generator. It was held by the court that subsequent damage was due to the arc, and that the insurer providing the boiler/machinery coverage was responsible for paying 50% of the claim.

Because electrical energy produced during a fault may vary greatly from fire energy released during a similar period, highly sophisticated forensic engineering techniques and analyses frequently are necessary to determine the precise cause, and whether ensuing fire caused additional damage.

In a recent case for a pulp and paper company, arcing occurred in a 2300 Volt switchgear. Fire resulted when oil-filled circuit breakers ignited after arcing began. All other switchgear units, including motor control centres and starters in the same electrical room, sustained varying degrees of damage.

Forensic engineers from Brosz & Associates were called upon to determine the cause.

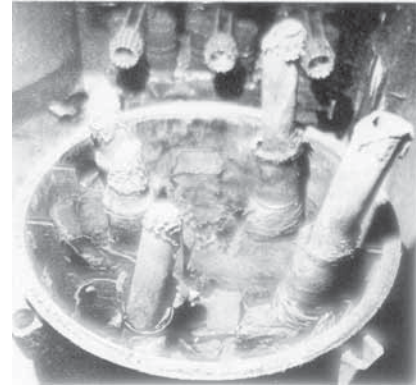
Analyses concluded that the damage attributable to arcing was 80% and fire accounted for 20%. Resulting business interruption was 100% attributable to arcing. Total claim by the company was \$8 million.

Various techniques including X-ray diffraction and spectrography, are used by forensic engineers of Brosz & Associates in determining causes of electrical-related fire damage. X-ray diffraction is often used to detect combustion compounds and bi-products in the analysis of soot samples, while X-ray spectrographic methods are utilized to determine the presence of finely-powdered metals such as copper, iron or aluminum vapourized during electrical arcing.

Arcing/fire energy ratio calculations often reveal the true picture as well. Simulations on video tape dramatize it.

The forensic engineers of Brosz & Associates provide an important service to industry, insurance company adjusters and law firms, providing technical investigation of insurance and failure claims. As well, the firm can provide the expert testimony often required as an adjunct to the investigation.

Arcing in a 2300 Volt switchgear resulted in the perforation of an oil-filled circuit breaker, causing an oil fire. Total destruction of all components resulted.



▲ *Remnants of a 2300 Volt circuit breaker showing total consumption of oil and insulating materials. Extensive arcing occurred on all current-carrying components. Note candle-like molten copper at incoming terminals.*

▼ *Fire damage to 13,800 Volt cable insulation.*

