

## **Substations - The Importance of Reporting signs of Damage, Vandalism and Trespass**

**This event occurred in 1985 but the lessons are still relevant now.**

There had been a failure of the busbar band joint on an 11kV outdoor extensible ring main unit. This fault had apparently been undetected. No positive evidence was discovered for the cause of this initial failure. It occurred after the switchgear was last inspected which was nearly two months before this particular tragedy. In the two months or so after this initial event, the summer warm weather had led to the leakage of the bitumen compound insulation from the broken band joint and had exposed the live 11kV busbars.

Two 11 year-old boys had scaled the walls of the substation and it is thought that they had been playing with the bitumen compound that had leaked from the failed busbar joint and they had access to the exposed 11kV busbars. As a result of their interference, a fault occurred in the open busbar joint chamber and caused arcing and the generation of hot gases which enveloped the two boys. Examination revealed that the band joint casing had failed below the fixing flange and had been displaced downwards to reveal an opening of about 8 inches. The busbar joint chamber was almost empty of bitumen compound, which had drained out exposing the 11kV busbars. There was considerable arc damage in the joint box involving all 3 busbars and the earthed metalwork of the joint box.

The two 11 year-old boys received severe burns as a result of the exploding faulty equipment and subsequently died in hospital.

The substation and switchgear were correctly installed, maintained and inspected. Gates and locks were secure but there was evidence of minor vandalism.

### **Learning Points**

- Reporting damage to equipment before it faults can save lives.
- Once defects or damage are reported, they must be appropriately prioritised and rectified in an appropriate timescale.
- Always check for and report *any* signs of damage, trespass and vandalism to substations. Have mechanisms in place to escalate temporarily inspections as necessary.
- Use the agreed industry guidance to evaluate current substation security and relate back to company risk-based policies