



Safety Advice 08-2000 (NZ)

EQUIPMENT FAILURE

On 26th June 2000, a Fluair 400 circuit breaker was being withdrawn from service to allow current injection testing of the earth grid. As the Fluair 400 circuit breaker was withdrawn from the circuit position, a flashover occurred in the bus bar spouts. The protection at the point of supply operated correctly and the supply was isolated. The explosion vent of the circuit breaker operated correctly and deflected the explosion upwards as designed. No personnel were injured.

An investigation of the equipment failure mode was undertaken. Dust in the circuit and bus bar spouts appears to be the major contributing factor in the explosion. The dust had entered during various construction phases. Design and maintenance issues were also raised in the report on the equipment.

The report identified remedial actions the asset owner could implement to reduce dust in substations. These were applying positive pressure to the rooms with time delayed alarms on loss of pressure, fitting door closers, removal of louver windows and warning notices about the need for retaining positive pressure in these areas. These remedial actions have been implemented.

At the time, an operational restriction was placed on the Fluair 400 equipment by the asset owner. The circuit breakers were not to be withdrawn from service unless both the circuit and bus were de-energised. A live line procedure was developed to clean the bus and circuit spouts and the rear cable termination areas.

The expectation when installing indoor switchgear is that long periods between maintenance can be expected. This is not always the case and it is recommended that when evaluating purchase of any indoor switchgear the maintenance requirements, ventilation and IP ratings be scrutinised closely.