

Electrical Accident In Glencoe.

4. ACCIDENT/INCIDENT: Borough of Glencoe.

Background to Event.

An employee of Glencoe Municipality was seriously injured due to electric shock when he came into contact with a 6600Volt cable at Substation No. 2.

Mr. Leon van der Merwe, Acting Manager Technical Services of the Borough of Dundee was appointed by the then CEO to conduct an preliminary investigation into the accident and was further co-opted by the Department of Labour to assist with the investigation.

The person in charge and apparently responsible for the accident was found guilty by the court, but was acquitted after he appealed, as the sentence imposed was not congruent with that prescribed in the OHS Act.

The probable cause of this unfortunate accident can be attributed to the following reasons:-

- Persons appointed to positions of responsibility beyond their capabilities.
- No proper switching and earthing procedures were followed.
- No schematic diagrams available of the network.
- Assumption made that all was safe.
- Switching on supply while staff was still working on equipment(no permit system).

Description of Event in Greater Detail.

From statements obtained from witnesses and persons in charge and an on-site investigation, it was found that no logs were kept of switching operations, therefore the procedure followed was given by the person in charge at the time.

On 30 October 1996 he isolated Substation No. 2 by opening all OCBs and racking them out. He then isolated the GPO, Biggar and Blue Ribbon feeders at the 'Magnafix' switchgear and placing the links he had removed in the switchgear cubicle and locking the cubicle. He then proceeded to open the feed from the 'Sanlam' Sub. At the 'Magnafix' switchgear and applied the earthing.

The supply from the SAR Hostel Sub. Was isolated by means of withdrawing the fuse links into an 'open' position without removing them.

The supply from 'Van Riebeeck' Sub. Was still open from a previous fault on the circuit. The medium voltage link in Substation 2 was opened.

The person in charge stated that he tested the installation on the morning of 31 October 1996, before work was commenced on the equipment and that a Mr. Purchase worked on the busbar end current transformers, at which place the accident occurred.

Ignoring the fact that no proper isolation procedures were followed, the investigating team tried to determine the possible source of the "temporary" supply of electricity that caused injury to Mr. S Mchunu.

The first possible cause mooted by the person in charge, was that a flash-over occurred at the SAR Hostel Sub. at the fuse-links, was investigated by the investigating team and found to have been impossible due to a number of factors, as follows:-

The distance between the 'live' points would not allow for a flash-over and the circuit breakers at Sub. No. 2 were still in the 'open' position.

On further investigation it became evident that the electrocution of Mr. S Mchunu actually occurred on the busbar side of the SAR Hostel oil circuit breaker in Sub. No. 2.

A further fact which emerged was that the earth-fault protection on the 'South' ring oil circuit breaker feeding 'Blue Ribbon' and the 'GPO' feeders tripped during the accident, confirming that the possible source of supply did not emanate from the other three feeders.

The possibility of back-feed through the local transformer through the MV links is also ruled out due to the fact that the 'South' ring oil circuit breaker had tripped on earth-fault.

In the opinion of Mr. Leon van der Merwe, the investigating officer, the source of supply could only have been from the 'South' ring supply, which had tripped on earth-fault during the accident. This leaves the only logical conclusion, namely that the path for the electricity supply must have been through the 'GPO' or 'Blue Ribbon' 'Magnafix' switchgear and the medium voltage links in Sub. No. 2.

STEPS PLANNED TO AVOID THE RECURRENCE OF A SIMILAR ACCIDENT.

The Borough of Glencoe with the assistance of the Acting Manager Technical Services of the Borough of Dundee, Mr Leon van der Merwe, designed the following measures in an attempt to avoid a similar accident occurring in future:-

- A log-book and permit system was implemented.
- Schematic diagrams of the MV system were compiled.
- Arrangements were made for all staff involved with MV switching, to attend the MV Switching and Regulations course at Durban Electricity.
- Sufficient earthing and test equipment was provided for the staff.
- As an interim measure, the Glencoe staff was trained in the correct switching and test procedures by the Dundee Electrical Department.
- As a further control measure, the log-books and permits were audited on a regular basis to ensure compliance.