RESOURCES AND STRATEGY

INDUSTRY ASSOCIATION RESOURCE CENTRE

ENGINEERING PROCESSES

SUBSTATION DECOMMISSIONING

AMEU 2007 PRESENTATION: ABSTRACT

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1 BACKGROUND

An existing substation was to be decommissioned and replaced by a new, upgraded substation at the same site. A fatal contact incident occurred at the final stage of the decommissioning process. The incident provoked a rethink of the definition of “decommissioned.”

2 DECOMMISSIONED

Decommissioned means different things to different people and to different engineering departments.

2.1 DEFINITION OF DECOMMISSION

The formal procedure for the removal of apparatus or systems from the existing system for extended period exceeding three months. (NRS

3 INCIDENT RECALL

A new Eskom Substation and customer substation had been built adjacent to the old existing substations.

A consultant was appointed as Project Manager to build the new substation.

A member from the Plant Department was appointed to co-ordinate the “decommissioning” of the old substation.

A list of usable equipment was identified and specified to be salvaged by the two Technical Specialist Groups.

The two team leaders met on site and agreed on who would salvage which equipment.

A major outage had been arranged for 25 June 2006 to commission the last transformer of the new substation and to disconnect the bypass 88kV line from the old substation.

The project leader for the decommissioning work communicated via e-mail (3 times) on the salvage work to be done, stating that the old substation was “decommissioned”.

The project manager failed to arrange for a Live-Line team to disconnect the temporary bypass on 25 June 2006.

The five-man technical specialist team arrived on site on 12 July 2006 at 11h40.

The team gained access to the substation by removing the unlocked sliding gate with a crane.

The team did a thorough inspection and completed and signed a risk assessment.

The team first removed a breaker from the secondary side of a transformer.

The deceased ascended a stepladder to loosen a 88kV isolator, when a flash-over occurred injuring him severely.

He received first aid, was stabilised by paramedics and transferred to hospital.

He was transferred to Milpark Hospital in Johannesburg later that day, where he died as a result of these injuries on 25 August 2006.

4 FACTS OBTAINED FROM THE INCIDENT INVESTIGATION

4.1 IMMEDIATE CAUSES:

Failure to adhere to ORHVS:

Conductors not tested to be dead.

No visible working (induction) earths applied.

Not contacting Network Control.

Failure to identify that the temporary bypass was still connected to the incoming feeder

Failure to barricade and to put warning signs at the 88kV No2 Infeed - abnormal isolator

4.2 BASIC CAUSES:

Inadequate communication, co-ordination, integration and follow-up between the construction and decommissioning Project Leaders.

Inadequate communication and co-ordination the operating staff, technical specialists and the decommissioning Project Leaders.

Critical information had not been verified.

Huge workload of the local operating staff.

Inadequate exposure to decommissioning work by the tech nical specialist staff.

Difference in opinion / understanding as to the meaning of “decommissioned.”

5 CONTRIBUTING FACTORS

The jumpers from the bypass line were not visible from the substation.

Three of the five member team have valid authorisation as responsible persons in terms of ORHVS – duplication of authority.

The quality of the flame proof clothing is questionable.

The first aid kits are inadequately equipped with burnshields.

All statutory reports of the incident had been made in time.

A small notice attached to the old Substation gate warned that the local supervisoe / engineer must be contacted for access to the substation was ignored.

6 RECOMMENDATIONS

Re-enforce Access Control to all substations (decommissioned or not).

Re-enforce barricading and displaying of warning signs for all abnormal plant.•

Re-enforce the adherence to working between visible working earths at all times(decommissioned or not).

All equipment shall be considered live until isolated, safely tested and earthed.

No team member will come in close proximity to any equipment until the responsible team leader has physically demonstrated that the equipment is dead.

A single Project Leader shall be formally appointed for any project where multiple departments are involved. The integration, co-ordination and communication process shall be documented and adhered to at all times.

Produce a uniform definition of “decommissioned” and process for the decommissioning of plant.