SAFETY PAPER
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ISOLATE, TEST AND EARTH

• Such a simple 3 step process?
• How then does it go wrong and operators end up like this
Contents

• Background
• Some photos of what happened
• What I think caused the accident
• Conclusions
• Questions
ARC FLASH

What Happens During An Electrical Arc?

**Arc Blast**
- 12,000 km/h
- 12,000°C
- < 1,200 km/h
- 1,000 °C

**Arc Flash/Flashover**
- 300,000 km/s
- 165 db
- < 1,000°C
- 50 cal/cm²

Associated risks:
- Burn injury through arc radiation energy, molten metal splashes and flames
- Noise & pressure injury through shock wave
- Smoke inhalation injury
Pravin Ramdass
• So where did it all start to go wrong?

• What were the steps in the process which led to this accident?
Label error
What happened on the day of the accident?

A team of staff had been looking for three possible faults in this MV double ring network over a 6 hour period.
When moving from the first possible fault to the next, earths which had been lifted on one leg of the switch pillar to do a fault location injection were not replaced.
Pravin returned to the SP hours later in order to replace the earths and return the healthy leg to normal.

In the meantime the wrong leg was now alive. Hearing a “static noise” he thought it a good idea to discharge the cable of its test residual voltage.
Even with this label error, if the basic safety rule had been applied the accident could still have been prevented?

Isolate, Test and Earth
1 - Ouvrir l'interrupteur de U.F. à tester.
Open the switch of the cable feeder to be tested.

2 - Vérifier l'absence de tension, fermer le sectionneur de terre correspondant puis ouvrir ce capot.
After verifying the absence of voltage, close the corresponding earth switch and then open the cover.

3 - Visser les tiges, mettre en place le pavé de terre puis le dispositif d'injection.
Screw in the copper rods, then fix the earthing point and then the cable test device.

4 - Enlever la barre de terre déconnectable.
Remove the earthing bar.
First simple lesson

Where possible use non confusing Labels
Conclusions

1. Labels are critical. This accident would not have happened if the Circuits had been correctly labeled.

2. Isolate, TEST and Earth. Don’t assume anything!!

3. Don’t simply discard info. Why did the cable length show 2 km on the fault locator when it was known to be 200m?

4. Use PPE
PPC AND EQUIPMENT

PPC – Protect specific areas of the body:

• Head, face, neck & chin
• Eyes
• Body
• Hands & arms
• Feet & legs
PPP AND EQUIPMENT

Head, Face, Neck & Chin Protection

- Head gear Kit
- Flash Hood
- Balaclava
Body Protection

- Insulated jacket
- Switching suit
- Shirt
- Jeans

Important:
- Coverage
- Fit
- Layering
- Maintenance
- Labeling
Foot Protection

- Good quality leather footwear – EN 345
- Electrical resistance 14kV dry conditions

CSB Lite
GP 300
• Thank you for listening to me.

• Any questions