

WHY ROUTINE MAINTENANCE?

Neglect of DC power equipment can cost lives and your business...

Failures in your communications equipment can seriously damage your business.

Rectifiers, batteries and UPSs all need regular maintenance. Rectifier and battery faults can be disastrous if not discovered quickly. They may do a lot of damage, be difficult to clean up – even dangerous. However, if detected quickly, a faulty battery or rectifier serves timely warning that critical equipment is starting to fail. Fast action at an early stage can limit damage and interruption of service.

Rectifier faults or failure can wreak havoc:

These batteries had been removed from a research centre in Warwick. The age of the battery played no part in its premature failure - just neglect. The investigation into this failure concluded that the float voltage on the power supply had drifted from the pre-set 54.5 volts to 59.2 volts. The result of the incorrect setting was that the battery had been overcharged for many months causing it to eventually catch fire.

Thankfully the case design meant that the worst the battery could do before it was noticed was to smoulder badly. The next step would have been a thermal run-away major incident. An annual maintenance visit should have prevented this from happening; financial constraints were blamed for the neglect.



Environmental Checks

Routine Environmental Checks could have averted the White Hill Earth Station disaster in 1991.

Whitehills is the Mercury satellite transmission site based in Oxford. Somebody there decided that they needed a longer standby time in the event of mains failure. In order to achieve this they put two large banks of batteries in a metal container next to the main equipment building.

The initial work was conducted in the early spring; temperatures were low and the container was cool. Bring on the summer and temperatures in the seventies and eighties, an all-metal container with no ventilation - all the ingredients for "thermal runaway". And runaway it did.

Strangely when it exploded it was six thirty in the evening and not at the height of the midday sun. Thankfully there was only one operative on site. The HSE report detailed an estimated temperature within the container of 130°C prior to the explosion; the batteries had got hotter and hotter until they eventually went into a "runaway" situation. The report also indicated that no inspections or checks had been made in the container. The facilities manager was quoted as saying "they were just batteries - we had them fitted and then forgot about them!"



The bottom line is:

"- knowledgeable routine maintenance is a smart investment".

Batteries require regular maintenance during their serviceable life to ensure a reliable maximum standby condition, that the batteries are operating within essential H & S environmental conditions and to avoid the potential financial consequences of failure.

Hazards:

- . Skin contact – dermatitis / burns
- . Eyes contact – blindness
- . Inhalation – lung damage / death
- . Ingestion – damage to kidneys

Unmaintained batteries:

Fire and explosion: hydrogen and oxygen gases are produced in the cells during normal battery operation (hydrogen is flammable and oxygen supports combustion).

The financial implications of telecoms power failure are well documented: lost revenue, clean-up costs, litigation and interruption to customer service - for any business, health authority, utility supplier, transport, educational or any other organisation that relies on a telephone service to conduct day to day business.

Rectifiers need maintenance:

1. If the output voltage is too high it damages the batteries.
2. If the output voltage is too low it won't maintain the correct battery capacity.
3. Dust particles accumulate in the fan mechanism of fan assisted rectifiers.
4. Rectifiers without temperature compensation need regular manual adjustments calculated to avoid a "thermal runaway".
5. Multiple rectifiers need to be checked for equal current share to prevent overheating.
6. Rectifiers more than 10 years old need output filter capacitors checked to avoid high output ripple content from the rectifier and battery failure.