



# Safety Advice 04-2005 (NZ)

## RING MAIN UNIT FAILURE

A Series 1 SDAF3 Ring Main Unit was recently removed from the network after 15+ years of reliable service and placed in storage as a network spare for a period of 18 months before being installed at a new location. Prior to being placed in storage, the unit was maintained with an internal inspection carried out, replacement of the insulating oil and an operation checked.

Once installed on site and during commissioning, it was found that one of the switches was not operating properly and would not close. Every time a close was attempted a popping and buzzing noise could be heard from within the insulating oil tank.

The unit was isolated and earthed for inspection. Upon draining of the oil and removal of the lid and fuse cartridge arrangement, the operating mechanism was found to be sitting at an obscure angle and in close proximity to the main busbar (clearance of approximately 4mm).

The operating mechanism shaft is held in place by, and rotates within, a steel retaining plate. This plate is secured by two M10 studs welded to the insulating oil tank. It was found that the spot/stud welding of the studs to the tank lacked in penetration and failed due to loading tensions. The spring tension on the operating shaft pushed the shaft in close proximity of the main busbar.

A problem with welding on Andelect Series One SD switches was first highlighted in Circulars ER 321 and ER 334 from the Electricity Supply Engineers Association of New Zealand in July and September 1991. The report states that the problem did not extend to SDAF3 switches; this is not the case as highlighted in the photos below.

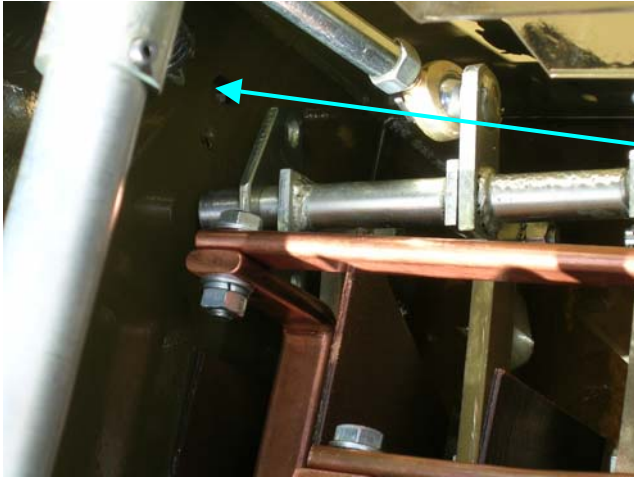
It is recommended that the switches be inspected and repaired if necessary by removal of surface mounted studs and replaced with studs welded through the tank wall as previously highlighted.



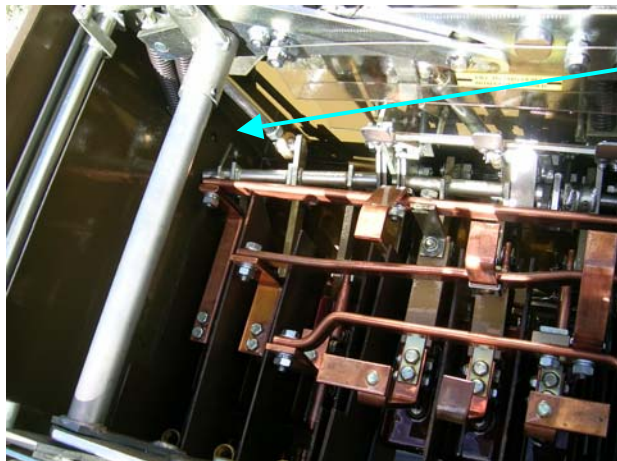
Location from where studs have broken away

Broken studs





Stud location



Stud location