



Safety Advice 09-2002 (NZ)

FLASH BURNS WHILE OPENING JEAN MULLER HORIZONTAL DISCONNECT

BACKGROUND

On 14 October 2002, an electrical fitter received flash burns to the hands when opening a 160 Amp Jean Muller three phase horizontal disconnect. The fitter had pulled the front cover of the disconnect (the fuse carrier) out and down in the normal motion to withdraw the fuses from the switch unit and was unaware that there was a locking mechanism on the front cover that attached to a plastic shroud behind the front cover. There is a reasonable amount of force applied when withdrawing fuses in order to minimise the time to break contact and in this case, the force applied was sufficient to break the grip of the clips which hold the shroud to the main body of the disconnect unit. The shroud came away with the cover and consequently the L.V. terminals were exposed as the circuit was broken. Although there was only 20 Amps being broken, arcing on each phase must have been initiated as the fuses parted from the contacts and, without the shroud, the arcs of adjacent phases were able to merge. The resulting 400 volt flash over burned the thumb of the fitters left hand (which was resting on the side of the unit), and the back of his right hand (which was holding the carrier). The fitter was temporarily blinded from the flash but was wearing safety goggles which protected his face from injury. He received immediate first aid (cooling of the burns) followed by treatment at the local medical centre, and is back at work on light duties.

ANALYSIS

Anyone operating this type of fuse unit should look for the plastic locking device on the top left hand side of the cover. It is a slotted disk with a pointer arm attached that is visible if the unit is locked. To unlock the unit, the disk must be pressed in and rotated anticlockwise until the pointer arm is hidden from view. The slot in the disk will be rotated from horizontal to vertical. The cover can then be safely opened.

Gloves, face shields and full cover protective clothing must be worn. The switch manufacturers have been made aware of the accident through our suppliers, and have agreed to remove the lock on all units supplied in the future. Unaltered units will still be supplied if a client has a particular need for the lock. They point out that the lock is an additional feature and is not included in the standard to which these disconnects are manufactured. This is the first accident of this type that they are aware of.



A set of 3 horizontal disconnects. The Jean Muller unit is the one on the right hand side. The locking mechanism is on the top left hand corner. It is in the unlocked position. There is no lock on the other two disconnects.



The same view but with the lock in the locked position.



The inside of the cover. The lock is on the right hand side and is horizontal, which allows it to pass over the locking tab on the shroud (unlocked position).



Same view but in the locked position (vertical so it can catch the tab on the shroud - visible at the lefthand side).



Looking down at the top of the switch. The cover has been pulled back with the lock on showing the connection between the two and the stress starting to pull the shroud away from the contacts.



The switch open but with the shroud completely pulled away from the contacts and still locked on to the cover. This is the damaged unit and the burning on the tip of the contacts can be seen.



An open switch with the shroud in the correct position covering the contacts.