

# SAFETY ALERT

No: 2013\_001

## Insulated Tram

An investigation into the incident on 11 January 2013 at Melbourne University confirmed that a driver received a minor electric shock when his tram became electrically insulated.

Contributory causes included a sand build up on the track and incomplete operational processes.

To ensure your safety the following procedure must be followed if an insulated tram is suspected:

### Symptoms and Response to a Potentially Insulated Tram

Tram	Symptom	Response
All	There is no tram power.	<b>1. Lower the pantograph.</b> <b>2. Advise FOC of the problem.</b> <b>3. Follow fault finding procedures.</b>  Note: If you <u>can't</u> lower your pantograph you must assume the tram is "live". In such circumstances avoid you or your passengers touching any metal surfaces.
W	There will be no interior saloon light.	
A	The power light indicator will come on in the driver's console.	
B	The interior lights will remain off (or flicker) while the emergency lights remain on.	
Z	The interior lights will remain off (or flicker) while the emergency lights remain on.	
C	The high speed circuit breaker will open. The 600/400/24v indicators on the driver's console will be red and absent.	
D	There will be no line voltage shown on the console display.	

***Even though the likelihood of having an insulated tram is extremely rare, if you are in doubt lower the pantograph Immediately.***



# INCIDENT FACT SHEET

## Melbourne University Insulated Tram

### THE INCIDENT

At 6.34am on 11 January 2013, Tram 3512 (a D1 Combino Class Tram) arrived at Melbourne University platform stop and indicated it had 'no line voltage'. When the driver leaned out of the off-side door to inspect the pantograph, he came into contact with the tramway fence and sustained a minor electric shock to his left arm.

### THE IMMEDIATE CAUSE

The findings of the incident investigation confirmed that the tram became insulated as a result of sand build up on the track.

### ELECTRIC SHOCK

When the driver touched the fence he inadvertently created a pathway for a small amount of electricity to pass from the overhead, through the tram and then back to the track. Although any electrical shock is serious, in this case it was minimised due to a number of reasons including the fact that the driver only touched the railing for a moment. Irrespective of this finding, any potential for an electric shock should be considered as having a far greater consequence and all power related incidents are comprehensively investigated.

### INVESTIGATION PROCESS

The investigation team, led by the Director of the Project Management Office, used a specialist investigation technique (Root Cause Analysis) to determine appropriate recommendations and corrective actions.

### INVESTIGATION RECOMMENDATIONS

The outcomes of the investigation can be summarised into four generic safety recommendations:

1. Risk Identification, Management and Control: Fault finding cards and processes are to be reviewed and updated to assist drivers with the identification of a potentially insulated tram. The card will detail the appropriate actions required to control the risks associated with that tram.
2. Sand Management: The use and management of sand is reviewed to ensure the effect of sand on track condition and cleanliness are minimised.
3. Verification of Track Condition: Monitoring processes are enhanced to support the accurate assessment of track conditions.
4. Processes to support the management of incidents, in particular the notification and response by employees, are reviewed so the right people with the right skills are available to manage an incident scene.

### SAFETY ALERT

A safety alert is attached to this fact sheet. It is a reminder to drivers of the symptoms to be aware of that can help you to determine if your tram is insulated and what action you should take if this situation arises. If you are in any doubt, remember to lower your pantograph and contact FOC.