



Not cordoning off the railway track and the crane truck operator's failure to ensure it did not slide downhill might be the main causes of the derailment.

RAIL TRAGEDY A DISASTER WAITING TO HAPPEN

The Hualien, Taiwan, derailment early this month that caused 49 deaths and some 200 injuries serves to remind us of the importance of ensuring safety in public transport.



Nuts and bolts

Edmund Leung

Most accidents occur due to human error, whether due to design, operational or maintenance defects.

The train appears to be of modern manufacture, as it is of the current "tilting" train type, tilting upward on the outside of the curve to offer additional comfort to passengers when negotiating bends to negate the effects of centrifugal force.

This train system, with an operating speed of 125kmh, is equipped with automatic train protection, which should prevent a train from closing on the earlier train on the same track.

Unfortunately, ATP would only be triggered when both tracks are short-circuited by metal components, such as train wheels on an axle.

In this instance, the construction lorry that traversed the track might not have had metal parts touching both rails, and therefore the railway signaling system could not detect it.

When the lorry that got stuck on the track came into view of the train driver, there would not have been enough time to brake the long and heavy train.

The media reported that the train was fitted with about 350 seats, but at the time of the accident, it was carrying 500 passengers, meaning some had to stand.

One does not need to be an expert to deduce that when a train crashes, those standing will receive severe percussions to their bodies, causing grave damage.

While buses may be licensed to carry standing passengers as they travel at relatively low speeds of up to 70kmh, putting standing passengers on a 125kmh-plus train would be risky. So it would not be surprising to find most of those casualties were standing passengers.

More importantly, railway lines are protected by railway operators and no trespassing of any type can be tolerated.

For electric railway systems, the area near the track should be protected by barriers. That does not only mean the immediate vicinity but should include some 30 meters of the surrounding area.

All construction and maintenance work near this area must be approved and monitored by the railway operator to ensure no safety threats.

In this instance, the maintenance work was adjacent to the track.

Press photos did not show any barriers, and should such construction work be approved, a railway operator must monitor it full-time.

That a construction vehicle could enter the site on a public holiday morning, presumably without approval or supervision, was certainly a major breach and must have been a cause of the accident.

Further to that, all drivers were taught to always leave vehicles in gear when parked, before firmly applying the handbrake—a vital move to prevent them from rolling down a slope. For that lorry to have been able to roll downhill to land on the track, it must have been left in neutral gear. Such negligence would have been another main cause of this catastrophe.

The saving grace was that the rescue operations were rapid and effective. Also the derailed coaches were constrained by the tunnel wall instead of rolling down an embankment. That prevented further casualties and injuries to the unfortunate passengers.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure