Cracks in railway tracks were found following the Hung Hom derailment in September, causing chaos for passengers.

SIMPLE SOLUTIONS GET WHEELS TURNING

Recent reports about malicious damage on Light Rail tracks remind me of the common problem of train services being disrupted when cracks develop in railway tracks.

They may not cause an immediate stop in services, but railway maintenance personnel must inspect and assess how far the cracks are developing to decide when to commence the repairs.

In most cases, the trains can still run for many hours while the repairs can be done during the next convenient night shift.

When serious cracks are discovered, the track section will need to be replaced before the cracks grow any further, leading to total failure.

When a railway track breaks, not only will it not have the strength to hold the trains running above it, it will no longer transmit signals, posing a danger to railway operations.

In layman terms, metal fatigue is due to the repeated reversal of loads, like bending a paper clip forward and backward.

After about five times, the paper clip weakens and eventually it will break if the bending continues.

For our peace of mind, this cyclic loading could be up to a million times for railway tracks.

Cracked railway tracks are normally replaced in sections, but for other metal components, relieving stress at the front of the crack is an acceptable means of repair.

A common temporary repair for cracks in metal is drilling stress-relieving holes or slots at that spot.

Car owners who have suffered windscreen cracks will know that a quick repair is to drill a hole at the cracked end to relieve stress.

A plastic compound is then used to fill the hole and the crack afterwards to ensure a good optical effect and a smooth surface.

There is a common joke in the aircraft industry, but I must reiterate that it is not connected to recent incidents involving the Boeing 737 Max or its manufacturer.

A group of aircraft engineers were scratching their heads for months trying to solve a stress problem at the wings, as it was causing cracking at the point where the wings were attached to the plane fuselage, but they were still not able to resolve the problem.

Eventually, the chief executive of that company openly sought help from all staff, and, lo and behold, someone smart came up with an effective means of taking care of the cracking issue.

At the presentation of an award, this person, who happened to be a janitor serving the staff toilet, was asked to explain how he developed this ingenious solution.

Stuttering as this 60-year-old, non-technical general staff member addressed the hundreds of PhDs in mechanical engineering in the audience, he explained that the way to do it was to drill slots along the line where cracks were found.

"So how did you come up with this idea?" asked the CEO.

"In my many years of service in the staff toilet, I am perfectly aware that the hardest part of the toilet paper is where the slots are, they often cause the paper to refuse to tear," the janitor replied confidently.

Please do not take this joke too seriously.

However, I can assure you that it carries a lot of truth behind the theory of metal cracking in the manufacturing industry, be it in aircraft, railways or the marine sector.

As always, simple solutions work best.

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