

## Near disaster on a railway caused by rats signals continued vigilance for cable installers

An investigation that concluded that rats caused a collision between two trains, leaving 40 people injured, highlights the constant battle between animal pests and man's vital infrastructure, says Dr Jeremy Hodge, chief executive of the British Approvals Service for Cables (BASEC).



At the beginning of July, a high-speed TGV train was struck from behind by a regional train in south west France. The regional train had passed a signal wrongly set on green and the potentially catastrophic malfunction was caused by rodents gnawing through trackside signal cables, an SNCF inquiry found.

The accident at Pau has prompted the French national railway to carry out an urgent check on 10,000 signals to prevent any further occurrences of what it says was an 'exceptional and unprecedented' incident.

But Dr Hodge says that the threat from rodents and other animals to cabling and the systems they carry is always with us, and presents serious challenges to specifiers, installers and end-users.

"We receive many enquiries about how to protect cables against rats, mice, squirrels, pigeons and even insects – with the first three the most pernicious and determined.

They can gnaw at cables to create nesting material. Rats must gnaw as their teeth grow constantly and it does not help that a rat's tooth is harder than iron. Cables under floorboards, in outbuildings and in ducts are commonly affected, including power, data, final circuit installations and fibre cables. The wiring looms of motor vehicles are also regularly attacked." Dr Hodge says that preventing vermin damage has three lines of defence. The first is building in physical barriers or deterrents, such as routing cable to avoid spaces in which rodents live or travel, for example, under floors, or embedding cables in conduit, plaster, cement or concrete.

Secondly, selecting the most suitable cabling for use where vermin might be present is recommended. Regular cable such as PVC conduit wire or flat twin and earth offers no protection against gnawing. However, steel wire armoured or steel braided cable offers some protection, though the sheathing itself may be attacked. Mineral insulated cable or steel conduit offer good protection.

It is possible to include deterrent additives – a bad-tasting chemical - into the sheathing material of some cables. But these have limited effect with mice or rats and they are mainly used overseas where damage from insects, including termites, is a significant problem.

Finally, controlling the pests themselves is an effective way to prevent or reduce further problems. Seek advice from specialist firms but less costly is to make sure holes, cavities and voids – even the smallest – are blocked up in buildings and that any source of food from waste and litter is removed.

The IET Wiring Regulations BS 7671 set specific requirements for designers and contractors to assess 'External Influences' such as fauna (coded as AL), in Section 522.10. The normal condition (AL1) is 'with no vermin present'.

Where 'aggressive fauna' are experienced or expected (AL2), an appropriate choice of wiring system or special protective measures must be used, such as cable with better mechanical protection, by using more appropriate routing or locations for the cables, or by providing additional protection such as conduit.

Cables gnawed through by vermin can result in electrical short circuits and fires and, as in the case of the Pau train collision, are significant threats to life and safety. It is unlikely that we are going to declare victory over rats, mice and squirrels soon but by remaining vigilant and adopting sensible preventive measures we can help guard our vital systems and infrastructure against their attacks, says Dr Hodge.

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