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Learning Brief: #028

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Hatfield train accident

This learning brief is shared in order to promote learning and improve safety. You should seek appropriate guidance regarding the relevance, accuracy, and completeness of this alert to your circumstances prior to implementation.

Theme

Hazard & Risk Assessment
Management of Change
Human Factors & Procedures
Infrastructure Status & Records

Summary of Learning

Cutting resource to maintenance programmes can save money by sweating the assets, but if there is insufficient information about the true state of those assets, catastrophic failures can occur. Organisational change can be a catalyst in these cases, as lines of communication and knowledge sharing can become blurred or even broken.

Description

At around 12:23 on Saturday 17 October 2000, a passenger train derailed on a curve at Welham, near Hatfield in Hertfordshire. The train had been running at around 110 mph at the time of the incident. Four people were killed and 70 were injured as a result.

The Health and Safety Executive (HSE) investigated and found that the high rail of the curve had broken into over 300 pieces. Beyond this, the rail was intact – though displaced – for about 44 metres, though there was a further fragmented length of 54 metres beyond that. The investigations revealed the cause to have been ‘gauge corner cracking’ (GCC), a particular type of fatigue crack that could be difficult to detect.

Failure of People Barriers

1. The contractors used by Railtrack (as infrastructure manager at the time) **lacked staff with the knowledge** to make the appropriate checks for gauge corner cracking and staff at Railtrack itself lacked the understanding to manage them.

Process

1. Railtrack's **process for tracking** the work of its contractors was **inadequate**.
2. Railtrack's culture of outsourcing meant that it **lacked technical expertise** of its own where track maintenance and the wheel-rail interface were concerned.
3. As Railtrack's contractors all used **different reporting systems**, Railtrack itself had **no one clear view** of the number of rail breaks occurring across its network. It had – as a result – **asset ignorance**.
4. After consultant advice, Railtrack had changed its track maintenance regime to replace rails when necessary and not at fixed time intervals. But it **lacked the knowledge of its own assets** that would allow this to happen safely.
5. Railtrack had tended to **put performance over safety**. This was deemed a factor in the changes it had brought about since privatisation from British Rail in 1994, and therefore a factor in the Hatfield accident.

Plant

GCC had first been noticed in the early days of diesel traction, when heavily-laden wheelsets revolving at higher speeds were found to 'flake' the railheads. Cases started to become more frequent when lines were electrified, as a higher tractive effort was exerted by the original electric locomotive classes.

In this way, changing one asset had a direct impact on another – changing from steam, to diesel power, to electric locomotives placed increasing stresses on the gauge corners of the rails.

Learning for other Sectors outside of Rail

- When changing one asset type for another, operators in other sectors are advised to consider carefully how this might impact on your other assets, and the systems in which they operate.

- Review risk assessments and scrutinise any changes to due process with care, keeping an eye on the 'big picture'.

Further reading

1. HSE / ORR, Final report on the derailment at Hatfield
2. Process Safety Forum, Knowledge Exchange Note 004 Management of Change