



Riddle of the Tay Bridge disaster

The Hatfield accident

Hugh Edwards:

Good evening. Four people have been killed and dozens injured after an Intercity train derailed at high speed in Hertfordshire.

Prof. Roderick Smith

The Hatfield accident was due to a rather specialised type of failure known as rolling contact fatigue caused by the passage of the wheel over the rail. The area of contact between the wheel and the rail is extremely small and that means that the top of the rail is very, very highly stressed and there is a competition between the wear of the surface of the rail, which removes the top layer of the rail, and the development of fatigue cracks.

It's important to recognise that fatigue is not a disease. It's an understandable and progressive failure of materials due to the birth and growth of cracks. And we can live with fatigue. Indeed, we must live with fatigue by monitoring the growth of cracks and replacing them before they reach a critical size.

Melissa Berry:

The Tay Bridge disaster happened at the dawn of modern civil engineering but its lessons are not lost on today's engineers.

Tom Martin:

The Court of Enquiry put the blame of the Tay Bridge disaster firmly and squarely on the shoulders of Sir Thomas Bouch but my personal opinion is that I think he was a bit harshly done to considering the knowledge of wind effect and structures at the time. That only became possible with the invention of wind tunnels and it's well to remember they were only invented at the end of the nineteenth century.

Pete Lewis:

There are many messages that the Tay Bridge raised at the time. They concerned the use of cast iron in tension. It should have been inspected much more regularly so that any cracking that occurred should have been reported to the engineer in charge and remedial measures taken.

Prof. Iain MacLeod:

I think it's very important that professional engineers have the integrity to look at what they're doing and if they've been pushed too far against the safety of the, of people that they are prepared to say, no I'm not going to do that, I just can't do it.