

Converging Routes Toward Total System Safety



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Over many years within the railway sector, it has been both a privilege and pleasure to experience both the British and Japanese railway systems. Although always based in the UK there have been many opportunities to meet with Japanese railway people and to learn about the differences and similarities between our two countries. This article reflects on that experience and what I have learned about the different approaches each country takes to safety, concluding that there are different ways to achieve safety but they all revolve around the human.

One of my first encounters with Japan and its railways was through the annual ‘pilgrimage’ that the leadership of RTRI

make to the UK. Working in a country that may have invented railways 200 years ago, but rather lost its way in the 20th Century, it was a surprise to me that Japan, the country that led the way toward the future of railways after the Second World War, could think that it had anything to learn from us. And yet Japan and Japanese railway people seem to show much more respect and interest in what goes on in British universities and railway companies than their British equivalents do in the other direction.

To discover that RTRI places its own people in various academic institutions in the UK and that its President and Senior Vice Presidents visit them annually to review their activity and to show support, was one of the great learning experiences of my career. It told me that the constant pursuit of improvement should have no barriers or limits, and that improvement comes about from looking around and finding who does things the best. Most of all, it aroused my interest in the Japanese approach. British railway managers, and particularly those who have been lucky enough to travel to Japan and experience the system, have tended to admire, but assume that things are so different that there is not really anything we can learn

from it. “The Japanese invest so much in high speed rail”, “run their trains totally on time,” “have zero tolerance of accidents” etc. These are all highly desirable objectives but from where British Rail was in the 1990s (cash starved; investing below the rate needed to maintain assets; no prospect of any high speed rail beyond the link to the French System via the Channel Tunnel; running only about 80% of trains within 5 or 10 minutes of their scheduled time; and experiencing an average of two accidents a year that cause fatalities, plus around 10 employees a year dying at work) it seemed so unattainable that it was not worth starting the journey.

Well how things can change in 20 years! In the last year, the UK railway saw:

- The passing of a Bill to build a new high speed railway from Birmingham to London, with the political commitment to continue north to Manchester and Leeds
- The first delivery of a fleet of nearly 1000 new passenger vehicles for 200kph operation on the existing network from a Japanese manufacturer who is assembling the trains in a new manufacturing plant in Britain
- No fatalities to passengers or staff in train

Fifty-year trend in train accidents with passenger or workforce fatalities

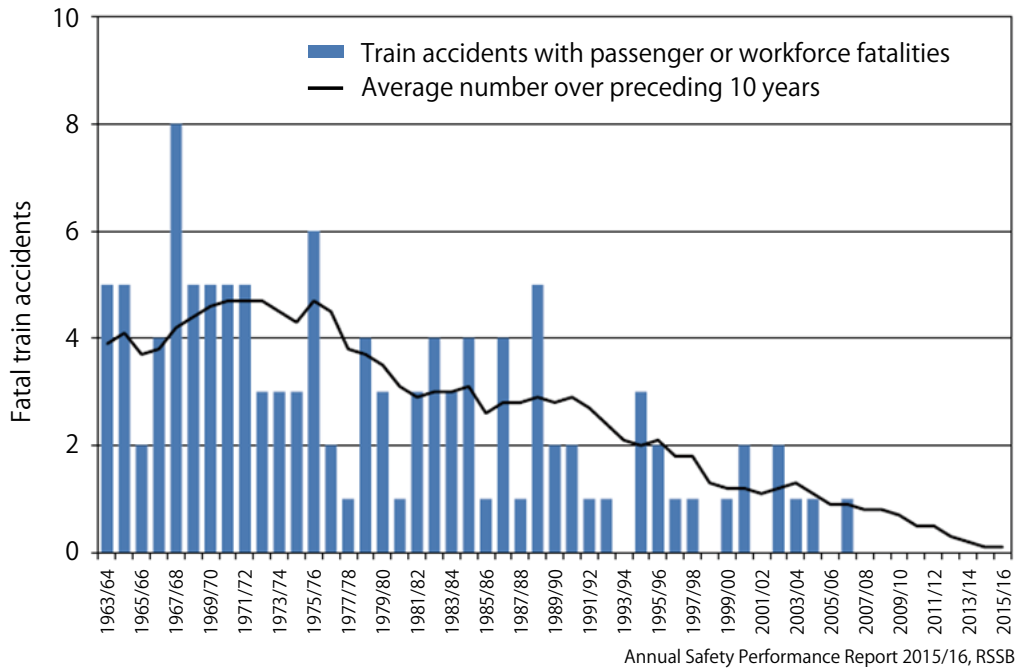


Fig. 1: Safety post privatisation

accidents from the tenth consecutive year (see Fig. 1)

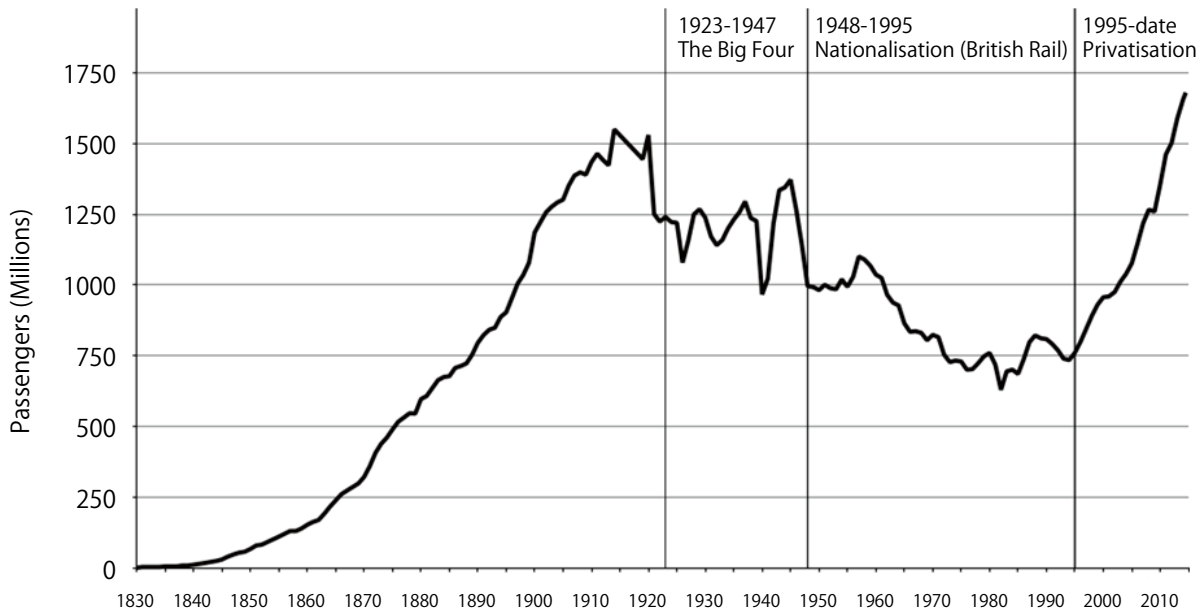
- No staff fatalities at work in the year – for the first time ever
- Passenger numbers at over 1.6bn up 100% since privatisation in the mid 1990's (see Fig. 2)
- And although not comparable to Japan punctuality, ran 20% more trains than ten years ago with punctuality around 90% compared to 80%

What lay behind this transformation was a combination of much higher levels of investment, in equipment and people, and a much more proactive approach to safety. To focus on safety, let's look at what

lay behind the improvements in the UK. Following a series of high profile accidents around the turn of the century, there were many changes initiated in the UK approach to safety, many of which (ironically) have been adopted across the European Union. Examples where the approach to safety has changed include the introduction of:

- a risk based, collaborative and consensus approach to standards
- safety management systems for all railway operations
- simplification of the 'rule book' which is common to all operators
- a system that reduced the risk from signals passed at danger by over 85%

- a confidential reporting system for safety concerns
- a close call system for all near misses
- Independent investigation of accidents with no role in deciding liability
- an independent industry body that analyses safety data and builds risk models
- a programme of R&D to support standard setting and risk management
- Human Factors/ergonomics as integral to safety management and system design
- the combining of the safety and economic regulators
- scanning and sharing worldwide experience of rail and other accidents



'GBR rail passengers by year 1830-2015 by Absolutelypuremilk'

Fig. 2: Passenger numbers since railways origin

One common theme, where I see convergence between the Japanese and British is in the attitude of management to staff errors. Both systems used to have rules that tell staff what they can and cannot do, and in the event of an accident, management was able to blame and punish the member of staff that transgressed, whether or not the error was deliberate. Today both countries realise that to be human includes making mistakes through normal behaviour (misreading signals, forgetting a work instruction, getting distracted etc) and that if we punish people for these sorts of errors, they will be less likely to report them and we won't learn all the lessons from what nearly led to an accident. The way to manage such mistakes is to use them all to learn lessons and to use investment and technology to make it impossible to

make the same mistake again. The policy of learning lessons, and improving systems to support humans in delivering safe and reliable services to customers is now shared between the railways of Japan and Great Britain and is critical in the continued improvement of safety levels in both countries. It is also a much fairer way to treat staff at all levels, as mistakes can and will be made at all levels.

On a personal level, I have always found that working with colleagues and friends at RTRI to be both a pleasure and enlightening. I commend anyone that gets the opportunity to learn by visiting overseas railways and research institutions to grasp it as they will always yield new ideas and possibilities to improve safety and performance in your own areas of responsibility.

Biographical Note

Anson Jack has worked for British Rail, Railtrack, Network Rail, RSSB and the World Bank. He is now Professor of International Railway Benchmarking and leads a team that researches many features of the world's railways within the Birmingham Centre for Rail Research and Education. He was responsible for RSSB Safety, research, development and innovation activity as well as being Deputy Chief Executive from 2007 to 2014. He is a member of the Technical Advisory Board of the International High Speed Rail Association and also advises SNCF on safety.