

INFORMED SOURCES e-Preview August 2019

This month's column looks at the future of train protection, raises concerns about the Department for Transport's secrecy over its enhancements plans, if any, and resolves an eight year old mystery.

TPWS – the once and future safety system

Enhancements - dismissive Jones fuels industry ire

IEP VTAC mystery resolved

October sees the 20th anniversary of the Ladbroke Grove accident in which 31 people died and over 250 were injured due to a Signal Passed At Danger (SPAD). Two years earlier another SPAD at Southall had resulted in 7 dead and 139 injured.

Train protection was at the centre of the public inquiries held into both accidents. Professor John Uff headed the Southall inquiry and Lord Cullen Ladbroke Grove.

Following Ladbroke Grove, and while the Southall Inquiry was still under way, a joint inquiry into Train protection systems was initiated by the Health & Safety Commission, under the two inquiry chairmen. Published in 2001 the Uff-Cullen inquiry report called for regulations to require that all trains running at over 100 mile/h should be protected by the European Train Control System (ETCS) by 2010, with the East Coast and Great Western main lines fitted by 2006.

Even before Uff-Cullen, the Hidden Report into Clapham had been expanded to include the SPAD-related fatal accidents at Purley and Bellgrove in March 1989. Published in November 1989, Hidden's report had recommended that BR should install ATP on a nationwide basis within five years of completing the pilot schemes then underway. That pilot scheme had been launched by British Rail in 1988, aimed at developing an ATP system that could be available for installation by early 1992.

However, Hidden had also recommended that Government and BR needed to 'conduct a thorough review of its investment appraisal procedures so that a financial value can be put on safety'. With hindsight, this was a case of be careful what you wish for.

BR's more-detailed Cost/Benefit Analysis (CBA) called into question 'the high priority given to ATP five years ago'. Based on a network-wide installation cost of £545 million, the cost per fatality averted by ATP was around £15 million.

At that time, the 'value of a life' applied to road scheme CBAs was £700,000. Given the potential for multiple fatalities in catastrophic accidents the rail value was tripled to £2 million.

In March 1994, BR submitted the report on its review to the Transport Secretary who passed it onto the HMRI. Its broad conclusions were:

Network-wide ATP gave costs of £8-14 million per fatality averted;

Other SPAD reduction measures would produce a better payback.

HMRI's endorsement of the BR review's findings was duly sent to the Health & Safety Commission in 1994 and forwarded to the Transport Secretary Dr Brian Mawhinney. On 30 March 1995, the Government announced the new train protection strategy.

While full ATP could not be justified, Dr Mawhinney confirmed that enhancement of the present AWS was being examined 'so that the brakes are applied automatically if a train approaches a red signal at excessive speed, indicating an impending signal passed at danger or over-speeding incident'.

And so the Train Protection & Warning System (TPWS) was born. It retained the warning function of AWS and added train protection.

At up to 40 mile/h TPWS would stop a SPAD within the 183 metre standard overlap beyond a signal. To cater for speeds above 40mile/h, an over-speed sensor would be located around 200m ahead of the signal, doubling the braking distance and covering speeds up to 70mile/h.

In October 1997, trial fitment of 20 trains and 10 signals on Thameslink began. Tests validated the concept. It was estimated that TPWS would eliminate 70% of the 'equivalent fatalities' at a cost of 10-20% of ATP.

Southall increased pressure for train protection to be improved. The result was the Railway Safety Regulations 1999 which required network wide fitment of TPWS by 2004. Following Ladbroke Grove, completion of fitment was brought forward to 2003. A largely unsung cross-industry programme saw this target met, on time and to budget.

Together with the fitment of the Driver Reminder Appliance (DRA) in cabs, to prevent starting against signal SPADs, TPWS resulted in a dramatic improvement. In 1999, just before Ladbroke Grove, the SPAD rate (SPADs per million train miles) had been 2.67. Ten years later this had fallen to 0.66, a 75% reduction. The SPAD risk, was 12.8% of the 2001 baseline figure.

Since installation there has been continuous cross-industry monitoring of all aspects of TPWS, both technical and operational. Currently this is the responsibility of the Train Protection Strategy Group (TPSG).

Strategy

In 2009, the TPSG published its first Strategy document. This was updated in 2015. As part of this updating, the TPSG reverse-

engineered the CBA of enhancing TPWS based on the residual level of SPAD risk.

At the current Value of Preventing a Fatality, plus the average cost of damage for train collisions and derailment, the exercise showed it would be reasonably practicable to spend around £2.4 million per year to mitigate the remaining SPAD risk.

Assuming TPWS has a future life expectancy of 25 years at its current level of deployment, the maximum discounted spend today that would be 'reasonably practicable' equates to around £40 million.

This level of spend, could support a significant enhancement to TPWS. Watch this space.

#### Industry kept in dark on CP6 Enhancements

With Network Rail now an arm of Government, any infrastructure enhancements for Control Period 6, which began on 1 April this year, will be specified and funded by DfT separately from the Operations Maintenance & Renewals budget already announced. Given the various debacles in CP5, not least the Great Western Electrification Programme, DfT made it clear a couple of years back that funding for enhancement schemes in CP6 would be limited. The only committed scheme is the Trans-Pennine Route upgrade (TPRU) at a nominal £2.9 billion.

Network Rail also needs funding to complete the various CP5 schemes, totalling £8.5 billion, which had been deferred or delayed following the review of the enhancements programme by Network Rail Chairman Sir Peter Hendy. These so-called 'Hendy-tail' schemes represent the bulk of the assumed enhancements funding for CP6.

In March 2018 DfT unveiled its Rail Network Enhancements Pipeline (RNEP). This is intended to provide information for all stakeholders on progress with proposed enhancements.

At the end of June this year, New Civil Engineer held its 'Future of rail' conference. One of the speakers was Network Rail's Head of Client Portfolio Yaelle Ridley. Naturally she was asked about progress with the RNEP. According to NCE, she told the delegates, that Network Rail had been 'specifically told we can't share the list'.

Now who should also be speaking at the Conference, but Rail Minister Andrew Jones. Challenged on the gnostic-pipeline and its impact on the contractors, Jones got shirty.

His rant concluded, 'Rail is being bought by this government like no other government in British history. Like no other government across Europe. So start getting with the programme of being positive'!

Among those not getting with the programme and being positive is the Railway Industry Association and its forthright Chief Executive Darren Caplan. In January this year, on the first anniversary of the RNEP, Mr Caplan had written an open letter to Mr Jones.

It began, 'Ahead of the Spring Statement tomorrow, I am writing an open letter on behalf of Railway Industry Association members to urge more transparency in the Government's approach to the rail enhancements pipeline. Our members tell us this has now become one of their top priority issues.

Mr Caplan noted that while the RNEP's five stage gateway process might bring openness in terms of how future enhancement projects were to be assessed, industry now had 'very little' visibility of the actual upcoming work required on the network. Only about £2 billion of the Hendy Tail has been approved.

RIA is concerned that that any new project will be announced only once it has successfully negotiated one of the five gateways. With no time limit for each stage of the RNEP, 'a project could take any amount of time to clear the pipeline and the decision could be taken to cancel a project at any stage'.

All this could lead to 'an enhancements hiatus in CP6'. True, Network Rail has a substantial renewals budget for CP6, but the specialists skills required for multi-disciplinary enhancements are not the same as those for largely single-discipline renewals: any hiatus in the enhancements programme 'could lead to these skills being lost to other clients or sectors', claims RIA.

Mr Caplan also reminded the Minister that DfT's secrecy is at odds with the reforms the Government set out in its 'Outsourcing Playbook', published in February this year. According to the Playbook, 'There is a new expectation that all central government departments will publish their commercial pipelines. This change will help suppliers to understand the government's long-term demand for services and prepare themselves to respond to contract opportunities'.

On top of all this, at the Transport Select Committee inquiry into rail infrastructure investment last year, the Government had committed to making the new pipeline more transparent.

Meanwhile RIA wants DfT to ensure that Network Rail publishes a full list of, at least, those enhancements projects for CP6 covered by the Hendy Tail. Not much to ask five months into the new control period.

#### Class 800 VUC revealed at last

Time for a pretty-insignificant exclusive. I have been pursuing the Variable Usage Charges (VUC) for the Intercity Express Programme (IEP) since 2011 when the hapless Theresa Villiers was Rail Minister. Her officials gave her some comparative VUC figures which were meant to make IEP look good, but, at the same time were ludicrously high.

Network Rail publishes a VUC price list at the start of each Control Period (CP), updated as new rolling stock comes along. But throughout CP5, which started on 1 April 2014, IEP Class 800 bi-modes were noticeable by their absence.

Periodically I would query this omission with the Network Rail press office, who would trot down to the small back room where the VUC works beaver away. And the message was that it was all proving very difficult.

In the VUC world, multiple unit vehicles are either Trailers (T) or Motored (M). A five-car Class 800 fits this template – sort of - but a nine-car has three types: motored vehicles, plus trailer vehicles with two radically different bogie designs – inside frame and outside

(H) frame. These bogies generate different track forces.

This mix of bogie designs, combined with the different proportion of trailer vehicles in the two lengths of Class 800, proved a problem when developing a single average VUC for a Trailer vehicle which could be applied to five and nine car formations. An average VUC could lead to over or under charging.

Anyway, while ORR has yet to approve the Class 800 and 802 VUC, There's a table with the provisional figures in the column. The solution was to have different Trailer car VUC for five and nine car units. The prices are on a par with a class 185 or 222.

While a bit of an anti-climax, after all the claims for track friendliness, what the exercise has shown is that the VUC system is due for an up-date. Since Network Rail needs to know what it charges for a train, and since most new trains are fixed formation, why not calculate the total VUC for a Flirt or a Nova based on the sum of the actual VUC values for each vehicle?

There are over 660 prices for freight locomotives alone, based on commodity being hauled, calculated to four decimal places. Surely something simple like a passenger multiple unit can't be that hard?

New Train TIN-watch

Making their debuts in 6th and 7th place respectively in this month's Table of Truth are the LNER Hitachi Class 800 bi-modes and the ScotRail InterCity IC125s.

Clearly having benefitted from all the mileage accumulated by the GWR Class 800s, the LNER fleet is not far short of its Western cousins and it's going to be interesting comparing the reliability growth of the two Hitachi fleets. Similarly with the two fleets of re-purposed 'pocket rocket' shortened IC125s.

Bombardier now has a second contender in the battle of the new generation EMUs with the first results from the three Class 710 Aventura units in service on the Gospel Oak-Barking Line.

And a sneak preview – the Viva Rail Class 230s make their debut next month!

Meanwhile, look for Hitachi to be selected as the suppliers for Abellio's replacement rolling stock fleet for the East Midlands franchise.

Roger's blog

Last month I was getting ready for a couple of lively days ahead. The first was presenting the Modern Railways Railway Innovation Awards.

This is always an enjoyable event – the more so when you have some excellent entries and worthy winners. You can read who won in this month's magazine. I always enjoy the variety in the award for small scale innovations: this year's short list ranged from an occupancy-based seat reservation system to a scheme which based paramedics at busy stations.

Next came my talk to the Retired Railway Officers Society – a tough bunch of experts' experts on any railway topic you care to name.

President Sir Michael Holden had listed the title of my talk as 'What I really think of you lot', but after teasing them with a new title '25 Transport Secretaries – their unsung role in major enhancements', complete with slides of John Moore showing how to install the new support mast he had designed for the ECML electrification, I launched into 'ECML traction from D to A'.

'D' was for Deltic and 'A' for Azuma with HST and IC225 in between. In addition to technology the talk ranged over the politics and people involved during a period covering the careers of many of those present. There was a lively Q&A session to finish.

July is set to end with the press launch at York to mark the extension of LNER's Azuma services to Scotland. After that I have a date to fix in August with Bombardier to see their new digital-ready MCB-OD level crossing. And at the end of the month, I'll be visiting Didcot to see how Resonate's Luminat Traffic Management system is being applied by the GWML signallers

September is empty for the moment, except for the Waterfront Rail Industry Forum on the 17th. As usual there are some interesting speakers lined up.

But meanwhile, enjoy the holidays

Roger