

With so much going on, this month's column had my page allowance bulging at the seams. We even had to move items in Captain Deltic's notebook elsewhere in the magazine before it would all fit in.

HS2 Phase 2 cancellation requires radical rolling stock rethink.

Salisbury collision report - management shortcomings highlighted.

No surprises in ORR Final Determination.

While I decided early-on not to cover the High Speed 2 project, the exception has always been where it affects the everyday railway to which I devote my time. Rolling stock is the obvious example, where the cancellation of Phase 2 has various consequences for the network.

In its 'Network North: Transforming British Transport' apologia for the cancellation of Phase 2, the Department for Transport claimed that completion of Phase 1 will allow the HS2 Classic Compatible trains to cut 30 minutes off the current Euston-Manchester timing, after joining the WCML at Handsacre Junction.

In the column I compare the times of an HS2 train and a Pendolino to Handsacre and conclude that the time saving will be 10 minutes. Once on the WCML, the HS2 train will be limited to 110 mile/h where the Pendolino tilts along at 125 mile/h. Why the speed difference? Well I go into the history of that too.

But where that 30 minute time saving came from remains a mystery. DfT has confirmed to Modern Railways that it assumes 110 mile/h running. But even so, a 1h 50 min London-Manchester journey time is not to be sniffed at, but not much of a pay-back from Europe's fastest high speed line.

Since the column went to press, Alstom has confirmed that it is starting consultation over redundancies at its Derby Works, where current orders run out in May next year. On social media this was being blamed on the Prime Minister's cancellation of Phase 2 of HS2.

As anyone who has been following my 'kittens' analysis of the future workloads of the various UK rolling stock assembly plants will know, the damage was done three years ago. HS2 train assembly was not due to start for another three years.

That said, when the Phase 2 cancellation was announced, a common assumption was that, with only 8 train/h compared with the 17 planned for the original Phase 1 and Phase 2 route, fewer trains would be needed. But is this necessarily the case?

My amateur timetabling, with no attempt to optimise turn-round times and stock utilisation, suggests that HS2 will still need most of the 54 units. DfT, which said that not all the trains on order would be required, told Modern Railways 'we are working through the detailed implications of the changes to the programme'.

I suspect the eventual answer will be 'the number we first thought of'. But given that the best opening date HS2 can gibe for its new line is between 2029 and 2033, DfT might try to negotiate an extended delivery programme with Alstom and Hitachi.

In the column I also look at various rolling stock options for HS2 services and consider the long term future of the existing Pendolino fleet.

Salisbury collision report highlights need for DVRS

One reason for the length of this month's column is that I go into the Rail Accident Investigation Branch's (RAIB) report into the October 2021 Salisbury collision in some detail. While the root cause was the driver of the train missing his braking point, and then sliding for nearly a mile before hitting the other train while still running at 50 mile/h, the low adhesion at that point was exacerbated by a number of management short comings.

As the RAIN report shows Network Rail's Wessex route did not effectively manage the risks of low adhesion associated with the leaf fall season. Nor was South Western Railway's management of the leaf fall period fully effective.

But the lesson I draw the Salisbury Report is that low adhesion has become to be seen as a 'Performance' rather than a 'Safety' issue. From Network Rail's viewpoint, the safety implication was Wrong Side Track Circuit Failure (WSTCF) due to the electrical insulation properties of the compressed leaf material on the railhead.

Loss of braking effectiveness was the train operator's problem. That said, in the RSSB's Safety Risk Model, low adhesion ranks 14th - on a par with Level Crossings and Signals Passed At Danger (SPAD).

So what is to be done? Well, the obvious solution is to enable trains to brake normally under low adhesion rail conditions. And back in the January 2022 column I described trials of a technology which showed how this could be achieved.

This innovative approach was Double Variable Rate Sanding (DQRS). But didn't the train in the Salisbury collision slide helplessly for almost a mile with the sanders of the Wheel Slip Prevention (WSP) system working as advertised?

Yes, but the problem was that not enough sand was being applied. Sanders currently in service, have to dispense sand at a fixed rate. DQRS is not affected in this way. Instead of a fixed average delivery rate, DQRS can put down a maximum of 4kg of sand per minute at speed if required, modulating the output to match the required braking rate.

Extensive testing has shown that this optimised sanding results in assured Step 2 braking under low adhesion conditions. And the RAIB report concludes, 'Although it is not possible to be certain of the actual benefits of DQRS in the specific circumstances of this accident, the analysis undertaken by RAIB suggests that it is probable that the collision would have been avoided altogether'.

DQRS fitment programmes are now in place for Northern Class 323 EMUs, ScotRail's 34 Class 170 DMUs plus SWR Class 158 and 159 units. The Rail Safety & Standards Board, funder of the research programme which developed DQRS, tells me that it will be a required feature in future new train procurement.

However, it's going to be a long time before DQRS is in wide scale use. So, how about a system which warns drivers in real-time of low adhesion locations on their routes?

Well, according to a January 2022 press release 'engineers from Loughborough University, the University of Sheffield and engineering firm Perpetuum have partnered to develop a new product that will detect low adhesion hot spots in real-time and create an up-to-date map of the UK's network which shows where any hazards might be'.

And according to Network Rail, the aspiration is to install a device on a Rail Head Treatment Train (RHTT) to capture intelligent seasonal treatment and demonstrate the effectiveness of the rail head treatment. The longer term ambition is to add the technology to passenger trains to capture continuous data at 125 mile/h. 'This would feed into an up-to-date adhesion map of the network'.

Now I know my fellow columnist Ian Walmsley and I have a thing about so-called 'innovation' actually only 'reinventing the wheel'. But this takes the biscuit.

Why fit adhesion detection devices to an RHTT to produce a 'map' of low adhesion hot-spots which will be out of date before it can be of any use, when service trains across the network are already detecting low adhesion in real time through activation of their WSP equipment when accelerating or braking. And this information could be collated and broadcast to drivers of trains in the affected sections of route.

Genius idea or what? Well, as you have probably guessed, it's not my idea. AEA Technology, which took over British Rail Research at privatisation, inherited and developed the Low Adhesion Warning System (LAWS) which was trialled on Thames trains in 1997-98.

By combining WSP operation with accurate train location data LAWS generated a map of low adhesion sites. Data sent from the train to the central Low Adhesion Mapping computer also included the train's location and speed, the time and duration of the event and the brake step or power notch applied.

Warning messages could then be broadcast to trains in the vicinity of, or approaching, low adhesion sites. While the trials in the UK were not followed up, LAWS was adopted by Netherlands Railways, with alerts transmitted directly to the driver via mobile phone.

Of course not only drivers would benefit. The information could also inform the scheduling of RHTT diagrams or the installation of lineside Traction Gel Applicators.

Resonate, which is the direct descendent of AEA Technology, still holds the rights to LAWS – although they had a laugh when I asked them about it. But suppose it was revived and even integrated within Luminate traffic management?

When it comes to low adhesion, as they said of the Six million dollar man, 'we have the technology'. All we need is a high-level champion in the industry to get a grip on its application. And if you think I am being over-dramatic, at Salisbury Junction, a potential head-on collision was avoided by a mere 40 seconds.

No surprises in ORR Final Determination

The August Informed Sources included a detailed analysis of the Office of Rail & Road's (ORR) Draft Determination of Network Rail's income for the five year Control Period 7 (CP7) which starts on 1 April next year. Final Determination, published on 31 October, contains few changes, with the focus remaining on performance, core assets and cost savings – 'efficiencies' in Regulatory-speak.

When it comes to performance we have yet another example of the malign influence of fragmentation. Network Rail Chief Executive Andrew Haines has contrasted his 'unique level of certainty', within the public sector, of funding over the next five years, with the contracted passenger operators working to an annual business planning cycle.

Will Godfrey, ORR's Director of Economics, Finance and Markets, told me this mismatch has presented 'quite a challenge'

when it comes to setting performance targets. For example, a busier passenger railway will be more prone to disruption.

But as we don't know how the hoped-for revival in passenger traffic will develop, this uncertainty affects setting performance targets for the next five years. As a result ORR is specifying firm requirements for the first two years of CP7. Indicative figures for the remaining years will be reset after Year 2.

In contrast to the evolving passenger business, what the freight operators need is stability. So five year targets are maintained for freight cancellations, as are the freight growth targets.

I have reservations about setting freight growth targets, since the volume of traffic is down to the private operators, their quality of service and pricing. However Network Rail can make their task easier, by running trains on time and by reducing cancellations – down to 1.3% in England & Wales over the five years of CP7. Eliminating operational limitations, such as axle load restriction on bridges, is also vital.

Pricing, however is a concern, particularly the increase in freight Variable Usage Charges (VUC). While the application of these increases will continue to be capped in CP7 the Rail Freight Group estimates that bulk customers are facing annual increases of around 5% over and above inflation over the next five years.

Renewals

A major issue in the Draft Determination was Network Rail's handling of what ORR terms its 'core assets'. ORR considered that an additional £540million needed be spent on these renewals, without reallocating spending from other renewals. A number of 'opportunities' for savings on other activities, totalling £820m, were identified in the Draft Determination. These could be used to fund this increased renewals expenditure.

According to Mr Godfrey, Network Rail has 'stepped up to this challenge' and accepted the proposed additional renewals expenditure. However, the reallocation from within the 'opportunities' proposed by ORR is still a work in progress.

And there are tensions. For example, the Final Determination highlights 'deliverability challenges' in both the West Coast Mainline North renewals programme and the European Train Control System (ETCS) signalling portfolio, both of which could slide expenditure into CP8. ORR hints at the stresses created by such 'opportunities', noting that 'although Network Rail has agreed to some re-profiling of these programmes of work, our final determination considers that it can go further'.

A final point on funding, inflation is higher than the forecasts made at the time of the Draft Determination. This has reduced the value of the CP7 funding in real terms. As a result, the England & Wales OSMR spend (excluding traction electricity) is now £38.5 billion where Network Rail's costs in CP6 were approximately £38.9 billion.

While we don't face a return of Sir Peter Parker's 'crumbling edge of quality' from the 1970s, the edge is certainly receding and will take four control periods (20 years) to return to the current condition – but only if extra funding is made available. Hard times ahead.

Roger's blog

First of all, my apologies to Modern Railways subscribers, for this issue of e-Preview arriving in your mailbox as the hard copy of the magazine comes through your letter box. The reason is that that old excuse 'pressure of work'.

Apart from writing a longer than usual column, I've been working out the results for the Golden spanners Awards (including a late Stewards' inquiry), spraying spanners – with what looks like the most durable gold paint yet - and writing my contributions to our annual directory 'The Modern Railway'.

This week I'll be preparing my presentation for the awards on Friday and starting my fleet reliability analysis for the January magazine which is Modern Railways' annual rolling stock special issue.

So must rush. Hope to be back on schedule next month.

Roger

