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Hoewel bijgaand artikel moeilijk te interpreteren is, lijkt distributie mij toch zinvol.

Het toont in ieder geval hoe zeer kosten bij ERTMS uit de hand kunnen lopen (hoe goed wij het dus eigenlijk nog doen) en geeft de problemen bij ERTMS aan (Level 3 is zeer moeilijk, leveranciers hebben problemen). In ieder geval is hieruit m.i. niet de conclusie te rekken dat wij in Nederland met onze relatief conservatieve aanpak (eerst maar eens de Betuweroute met Level 2 uitrusten) op de verkeerde weg zijn. In tegendeel.

Met vriendelijke groet,


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Bijlage: Artikel "West Coast - now it's £5.8 billion"

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West Coast - now it's £5.8 billion

Overnight, the cost of modernising and upgrading the WCML has more than doubled. A billion here and a billion there soon adds up to a serious project.



It is now quite clear that, until Chris Green came on the scene, no one in Railtrack, or Virgin Trains for that matter, realised that the West Coast Route Modernisation (WCRM) was a project going nowhere slowly. Readers of this column, of course, had seen it coming for months. Indeed, at the Railway Writers' Millennium Awards dinner before Christmas I was voted 'Bore of the decade' for my West Coast main line (WCML) coverage.

Serendipitously, just as Chris Green's bombardment of

Railtrack began, Robin Gisby, then Railtrack's head of freight, was standing in as acting Commercial Director. When WCRM came up at the first board meeting, he realised big trouble was brewing.

As a first stage, he managed to produce the schedule of work for Phase 1 (Core Investment Programme [CIP] plus Passenger Upgrade 1) which Railtrack was contractually bound to give Virgin Trains – albeit in the nick of time. For his pains he was given responsibility for network development, including the WCML.

Even more serendipitously, Railtrack had appointed Tony Fletcher, an experienced project manager, as General Manager responsible for the WCRM project (odd title that). And Mr Fletcher has since achieved an amazing amount in a very short time.

Underestimates

But it became clear that the scope of work, especially to meet capacity commitments under PUG2, had been underestimated. Ditto the likely timescale for moving-block signalling.

This major re-evaluation resulted in the revelation that

the price of the CIP plus the two passenger upgrades (PUGs), plus further work to meet capacity commitments under PUG2 had escalated to £5.8billion from the previous £2.2billion for the CIP, plus PUGs 1 and 2.

Strictly, the cost has only (!) increased to £4.8billion – the spare billion represents a further Capacity Upgrade to meet commitments to other WCML users. I am calling it CUG1.

This £1billion will now be needed to provide the 42 extra freight paths on the slow lines, – not now due for completion until 2007, two years after PUG2.

Table 1: How WCRM costs increased

Railtrack budget (£million)	1998	1999
Track & structures renewal	570	780
Remodelling (a)	640	1,600
Resignalling/control	485	1,900
Power supply and OHLE	285	580
Other	220	–
Total	2,200	4,860 (b)

(a) Includes some four track in Trent Valley.
(b) 1999 total includes management charges.

Source: Railtrack

PUG1 - 856 DAYS TO GO



WCRM must cope with high-speed passenger and also freight trains. Near Norton Bridge on 25 November, No 87021 powers the 12.05 Euston-Liverpool while No 47302 is in charge of a northbound Freightliner.
Bob Sweet

As Table 1 shows, signalling and control costs have quadrupled compared with the budget Railtrack published in 1998 ('Informed Sources', January 1999). This includes an estimated £750million for conventional resignalling now needed (see p20).

Remodelling has also proved significantly more expensive, as capacity limitations have been exposed by the PUG2 contract. It now looks like £1.6billion, compared with £640million.

Also missing from the original £2.2billion were the management costs associated

with such a large project, compounded by the lack of progress: Railtrack now has less and less time to do more and more work to meet its PUG2 commitments in particular.

Railtrack's original core management team of 300 has already been augmented to 1,500: the total number working on the project is expected to rise to 5,000 to 7,000.

Time runs out

Now all this talk of more money obscures a vital point. More billions mean more work. If, instead of £2.2billion by May 2005, the cost is now £4.8billion, with another billion by 2007 (-ish), Railtrack has at least twice as much work to do in a fast diminishing time.

Which means more possessions, blockades and general disruption. In a press briefing, Railtrack said 6,600 possessions were needed. A chum who knows a thing or two about major projects reckons this is a major underestimate.

Apparently, Railtrack's non-railway project consultants have assumed you could have several activities going on simultaneously with gaps between work sites. For example, two miles of track

renewal, a two-mile gap, then two miles of overhead-line renewal.

Sadly this overlooks the need for works trains to run in and out. The ballast-cleaning and track-renewal trains need thousands of tonnes of ballast a night, plus rail and sleepers – and spoil must be removed. Try that with another possession a few miles away.

With many more possessions (now plus signalling work), service trains are going to be running through a building site up to PUG2 in June 2005 and, now, beyond. This will clearly hit operators' revenues, Virgin's in particular.

Can I see no kindly light? Afraid not. If Tony Fletcher and Robin Gisby had been in from the beginning, when the then Office of Passenger Rail Franchising and Railtrack signed up to the CIP and PUG, we would stand a chance.

They are doing a terrific job, but I fear for the railway's reputation as it becomes apparent that the supertanker cannot be turned or stopped. The government is said to be planning to hold a general election next year. So it looks as though, like the Tories in 1997, hopes that rail policy will be a vote-winner are unlikely to materialise.

Then we will see what Sir Alastair Morton is made of.

West Coast signalling - wait for the fat lady

Has reversion to ETCS Level 2 sorted Railtrack's signalling problems on the WCML? Er, no, it's made them worse - much, much worse.

At one stage in the Gallic Wars, Julius Caesar had three things to do at one and the same time. Compared with those responsible for signalling on the West Coast main line, Caesar had a cushy number.

Consider what has to be done between now and, variously, 2 June 2002 and 29 May 2005.

First and foremost, Railtrack is committed to installing the Train Protection & Warning System (TPWS) at all signals protecting conflicting movements by the end of December 2002 (the legal end date is 31 December 2003).

That includes 900 WCML signals, and is not a trivial operation. It means installing the two sets of speed-detecting loops on the track, then wiring them into the signalling equipment case.

The stringent qualification requirements for signalling tests and procedures post-Clapham have made signalling installation very slow compared with other railways, so TPWS is going to occupy a significant proportion of the limited pool of qualified installers – a pool that has shrunk to match Railtrack's cutback in new signalling investment. And Westinghouse has been barred from TPWS installation for some reason.

Balises too

Next, on the same track, Railtrack has to install the track-mounted balises to support whatever type of speed control emerges for Virgin's tilting trains. The West Coast is

pretty curvy, and at many curves there may have to be three balises: one to say 'speed restriction ahead', another to check the speed on entry to the curve, and one after the curve to display a new speed. Balises will also have to be installed where tilt has to be switched off for restricted clearances.

The balises (standard units developed for the European Train Control System) will have to be installed and tested in time for Virgin to start running Pendolini at 125mph (200km/h) from 2 June 2002. Fortunately, they don't have to be connected to the signalling system, but someone has to programme them (argument still ranging over 'bright balise' versus 'smart train') and have possessions to install and test them.

Simpler is harder

Meanwhile, the decision to revert to ETCS Level 2, in place of the all-singing, all-dancing radio-moving-block signalling, has pretty well guaranteed Virgin will not get 140mph operation in May 2005. Not that the original moving block would have been ready before 2007-2009 (Alstom now tells us).

Given that the simpler system will involve much lower technical risk, how can it make things worse?

Let's recap why radio-based moving block was flavour of the month for so long. First, radio meant you could get rid of all that expensive lineside kit and its maintenance, not to mention

very much post - Han w (CG-SM) in dnd

Table 2: WCML additional 'Capacity Upgrade 1'

Four-track remainder of Trent Valley.
Duplicated fast-line platforms at Watford.
Work to meet 42 additional freight paths commitment.
Cost - £1billion.

(Note - Hanslope flyover to be funded separately by North London Railways franchisee Silverlink, subject to franchise renewal.)

Table 3: Where WCRM money goes (£million)

Year	CIP	PUG 1	PUG2	CUG1	Total
1998	1,350	150	600	nil	2,100(a)
1999	£1,750(b)	150	2,900(b)	1,000(c)	5,800

(a) Does not include notional £127million for freight capacity work.
 (b) Now includes management charges.
 (c) Remodelling work for extra capacity. Does not include Hanslope flyover at £50million or four-tracking Coventry-Birmingham corridor.

encouraging two European manufacturers to bring their technology to the UK, neither has got safety-case approval. One pilot scheme (Siemens) is stalled, and the other (Ansaldo) uses a new electronic interlocking which saw its first application in Rome recently and reportedly did not distinguish itself on the first day – which happens in the best regulated of signalling technology.

Normally, new technology is piloted somewhere relatively manageable: SSI cut its teeth at Leamington Spa. But under its programme to bring in new technology and resources, Railtrack allocated Ansaldo's interlocking to the Manchester South resignalling.

This gives rise to yet another cause for concern. Manchester South is crucial to the new capacity needed by 2002 – that date again. But the proposed computer-based interlocking still has to go through the Railtrack Safety Review Panel. Given the rate of progress on simple, proven, low-cost interlockings (like those from Vaughan Harmon and Westinghouse, where suppliers now have long and bitter experience of the process), I can't see the new main-line interlocking for Manchester being ready by 2002.

Now, a brief interlude to illustrate the scale of the problem. On the Norwich-Cromer resignalling, which uses a Harmon dual-processor vital

safety interlocking, humming away safely in large numbers in the US of A, the number of safety-case documents prepared by or for consultants got so large that an uberconsultant had to be appointed to co-ordinate all the consultants' work.

So, Railtrack has better brush up its hand signalling for when the first Virgin Pendolino crawls into Manchester.

Supply and demand

Only Alstom Signal and Westinghouse Signals can supply SSI hardware. They can also do scheme design, as can WS Atkins, and they have installation and commissioning teams.

Adtranz Signal, which has the signalling scheme design and implementation facilities in the UK, has told Railtrack that it is not prepared to supply SSI packages which it would have to source from the other two majors. Instead it is negotiating a contract to trial its EBLOCK electronic interlocking at Horsham.

Time for another diverting interlude. One of the reasons for bringing in foreign signalling firms was to increase the design and installation resources available. Wrong again. The two low-cost schemes are soaking up British Brains on Sticks. Even more risible, CSEE, which is fronting up the Manchester South project for its parent Ansaldo, decided that UK signalling principles were so different that only a UK firm

could do the scheme design – and Westinghouse obliged.

Given the five-year time frame, plus the unprecedented penalties Railtrack faces if it fails to deliver PUG2 to Virgin in June 2005, the boot in signalling procurement is on the other foot. After years of browbeating the signalling companies for being too expensive, inefficient, incompetent and slow when commissioning, Railtrack is now dependent on Alstom and Westinghouse to dig it out of a huge hole – or at least limit the damage.

Will industry be magnanimous? Will they hell. This is the private sector, and firms are not going to take on silly timescales at silly prices. Remember that if the signalling is late, the contractors will of course be blamed.

Assuming that Railtrack can get the tender documents out yesterday, strike a deal quickly, and organise a whole set of new possessions, you might have south of Crewe resignalled with SSI during 2004. The logical approach would be to roll Westinghouse's current Euston-Willesden resignalling up through Watford to Rugby and, in parallel, have Alstom resignalling from Rugby and up the Trent Valley.

Signal spacing issue

Back when hard-nosed signal engineers were in charge of Railtrack's West Coast resignalling, the consensus was that about four signals would

have to be moved to give sighting or braking distances for 125mph running in 2002. Remember that the Virgin Pendolino will have a shorter braking distance than the InterCity 125 High Speed Train, since the Pendolino brakes at 9% adhesion all the way down from 125mph, whereas IC125 is limited to 7% between 125 and 100mph.

But now the latest news is that 400 signals will have to be moved. Yes, four hundred.

Yes, I know it's unreal. Yes, I know it means more possessions and more work for an overstretched signalling resource. No, I don't know why grown-up people do this sort of thing.

Railway Group Standard GM/RT2042 calls for a train to stop (worst braking performance) from 200km/h in 1,775 metres. When Virgin tested Eurostar on the WCML in 1997, the stopping distance was 1,750m. As the WCML's existing signals average out over the whole line at around 1,000-1,100 yards (installed in pre-metric days), the distance between the double yellow and the red is considerably longer than 1,775 metres. Weird eh?

But, glimmer of hope, I hear that the need for changing signal spacings is being reviewed. If the new answer is more than 10, Tony Fletcher should throw the report in the bin and drag some grizzled signalling engineers out of retirement and tell them to kick ass.

Captain Deltic rides again

On his hobby horse, that is, as GNER come up with a characteristically off-the-wall idea.

Tucked away in a Great North Eastern Railway press release were details of the traction and rolling-stock plans in the company's franchise replacement bid. Buy 25 Pendolinos (ho hum), refurbish

the IC225s (yawn) – but what's this! Buy 10 diesel locomotives to replace the HSTs which will be life-expired in 2007 – now that's more like it!

So I asked GNER's ever-helpful press office what these

locos would do. Well, the intention is that they would haul IC225s from where the electrification stops – further into Scotland and to Hull for example.

Hmm. The aim would be to couple to the Class 91 or Driving Van Trailer and vroom, vroom, off we go.

Hmm again. Hauling an IC225 at a respectable pace while providing 'hotel power' for on-board services would call for a lot of horses. Oh yes, and GNER tells me it would be nice if the loco could run at 140mph too.

Virgin too

Meanwhile, Virgin Trains has issued a Notice in the Official Journal of the European Communities calling for bids for 'Thunderbird' diesel locos to haul its Pendolini when the power is off – or even rescue a dead Pendolino (sorry Alstom/Fiat, I know you are committed to 60,000 miles per casualty, but better safe than sorry).

Now I suppose you could have the usual Class 47s, but if you have absorbed the preceding WCML reports, it will



More traditional signalling has staged a comeback for WCRM. Signal BY27 stands guard as Class 58 No 58026 heads away light from Bletchley on 31 October 1999.
Hector Denman

renewal. Second, moving block would give more capacity.

In vain did my vastly experienced signalling chums point out the flaws in these articles of faith. They were perceived as old railway dinosaurs: Professor Brian Mellitt, Railtrack's then Director of Engineering & Production had seen the future, and its blocks would move, first on the Jubilee Line, then on the WCML.

Moving block's ability to deliver extra capacity was always suspect. With all the trains on the fast lines running at the same speed, moving block gave no benefit, while on the slow lines, reconciling the variations in traction and braking performance was a huge technical challenge.

But it was left to Dutch railway engineers to demolish the argument. They showed that when you allowed for the delay between the driver applying the brakes and the pneumatic brakes coming on, the capacity gain was destroyed.

Even more devastatingly, they pointed out that, to maximise capacity with moving block, you also had to assume that the train in front would brake normally, with the following train stopping in the same distance. But as the Eschede accident in Germany and Ladbroke Grove showed, trains can stop suddenly when they hit each other or a lineside obstruction.

Farewell moving block

So bye-bye moving block, hello ETCS Level 2. You might think that moving down in the complexity hierarchy would save money. Sadly not.

In ETCS Level 3, you can get rid of lineside signalling

because the train knows where it is from balises on the track. All the vital safety kit is in the Radio Block Centre (RBC) instead of being spread over hundreds of miles.

So each train calls up the RBC on its digital radio and tells the vital safety computer where it is and how fast it is travelling. The RBC thus knows what every train is doing.

Vital safety systems, as yet undefined, calculate what is needed to maintain safe separation, and the RBC radios each train individually every few seconds with its maximum speed and Limit of Movement Authority – that is, how far ahead the maximum speed applies. This is displayed in the cab.

But ETCS Level 2 keeps the existing trackside train-detection equipment (track circuits or axle counters) and interlockings: the cab display simply replaces lineside signals.

Instead of driving multiple-aspect signals, each interlocking sends this information to the RBC: don't ask me how, probably by fibre-optic landline. Somehow the RBC knows which train is where (don't ask, probably from the train describer), cross references this location with the signalling data, and transmits the equivalent of signal aspects to the cab display in each train by radio. For 140mph (225km/h), you need to look five or six signal blocks ahead – equivalent to a flashing green signal aspect.

So instead of retiring the existing 1960s-vintage signalling, Railtrack now has to replace conventional signalling on the WCML south of Crewe if Chris Green is to have the cab signalling he needs to run at 140mph in 2005. Not to mention keeping its commitment to have Automatic Train Protection on inter-city lines.

But, in addition to this unplanned and unbudgeted resignalling, Railtrack still has to build the as yet pretty nebulous RBC and get GSM-R

radio working, and link the conventional lineside kit to the RBC.

Told you so

This column never says 'I told you so'. What never? Well, hardly ever. This is not because of any innate modesty – periscope the thought. No, it's just that whenever I find some example of stunning prescience in a past column, I turn the pages to see what else I got right and invariably find some example toe-curling naivety, over-optimism or just plain ignorance.

Just this once I will refer you back to the January 1999 'Informed Sources', where I published Railtrack's breakdown of the £2.2billion cost of WCRM. And I wrote: 'I which point note that resignalling and control is budgeted at £485million. But Railtrack say TCS will cost between £500million and £1billion. That doesn't leave much for a couple of Network Management Centres and extensive resignalling of junction areas with solid-state interlocking.'

'Is the WCML doomed to be forever tarted-up on the cheap?'

There you are – right and wrong. Because the cost of resignalling and control on the WCML, including conventional resignalling for ETCS Level 2 is now £1.9million. And it seems to me that if the improbability of that £485million was obvious to a failed traction engineer a year ago, it seems odd that no one Railtrack spotted the discrepancy.

SSI bonanza

When it comes to the choice of conventional technology for this resignalling, likely to cost around £750million, the five-year deadline for PUG2 means there is no choice. It has to be that British world-beating technology, the Solid State Interlocking.

No, this isn't blind nationalism. While Railtrack