

# CHANNEL TUNNEL RAIL LINK TRANSFORMS HIGH-SPEED TRAIN TRAVEL TO EUROPE

On 16 September 2003 the Prime Minister Tony Blair opened stage one of the Channel Tunnel Rail Link (CTRL), the first new high-speed rail link to be opened in the UK in over a century. Andy Verrall looks at the success of the line and how it differs from conventional railways.

CTRL stretches for 46 miles (74km) from the entrance of the Channel Tunnel to north Kent. It is the first railway in the UK to fully utilise cab signalling using the French TVM 430 system with a maximum line speed of 300km/h. Track circuits are used for train detection. A signaller's workstation and an EMMIS Controller, who controls the overhead line power, are located in the control centre at Ashford.

TVM 430 uses automatic train protection (ATP) that is similar to the ERTMS level 2. The ATP system gives braking intervention when the train exceeds the cab-signalling indication displayed to the driver. If speed limits are exceeded, the ATP either reduces the train's speed or applies emergency braking if the potential exists for the train to exceed the stopping point.

CTRL is designed to speed signalling principles. The TVM 430 system works by providing continuous transmitted track-to-train coded messages. These messages are transmitted via the track circuits to the on-board train equipment, which receives and processes the information and displays a movement authority to the driver in the form of a speed not to be exceeded. Each type of train is specifically coded to its own characteristics, for example, braking capability and maximum speed. If the train loses transmission, the

driver will see a triple red indication on the cab-signalling display with emergency braking being initiated. Should a track circuit fail, the code will not be transmitted. Therefore, a stopping sequence will be given from the block section marker in the rear of the failure.

The line is divided into block sections of approximately 1,500 metres, the start of each block section being denoted by a marker board. The boards, with yellow triangles on a blue background, are clearly visible from the M2 and M20 motorways where they run parallel to the track. If the route is set ahead of a marker and the TVM code is being transmitted, the marker's status is classed as 'open'. If no route is set and the TVM is indicating 'stop' the marker is classed as 'closed'.

Emergency Replacement Switches (ERS) are located each side of the line at approximately 1,500m intervals. When operated, these prevent the TVM code being transmitted to the track circuits in the block section, thereby giving an emergency stop to any train within the section.

All block section markers are identified with an N for non passable or P representing passable. N markers protect block sections where there are junctions and points. P markers protect plain track block sections, as CTRL has adopted the

French 'Mache voue' permissive working procedure, which is designated as 'proceed on sight'. This gives the driver, whose train has been brought to a stand at a P-marker, the authority to restart the train and 'proceed on sight' without any verbal communication with the signaller. 'Proceed on sight' means the driver must keep to a maximum speed of 30km/h (emergency braking will be applied if the speed is exceeded), maintain a sharp lookout and be prepared to stop short of any obstruction ahead. In the event of a track-circuit failure ahead of a P-marker, communication is not required between signaller and driver. The driver proceeds on sight until the cab signalling indication changes to a higher speed movement authority, after the train has passed through the failed track circuit area.

Each N marker is provided with a train stop loop. This facility prevents a train that is proceeding on sight from inadvertently passing a closed marker. An auxiliary signal is also provided. The auxiliary signal is available for signallers' use in the event of a track circuit showing 'occupied' ahead of an N marker. This could be track failure or a failed train. When opened, two, white, flashing angle lights (at 45°) are illuminated to the driver. This gives the driver authority to pass a closed N marker and proceed on sight

through the block section. Again, there is no requirement for any verbal communication with the signaller. It should be noted that when a driver passes a block section marker and proceeds on sight, the cab signalling display changes to three reds (Triple Red). TVM 430 also provides a facility to impose speed restrictions of 230, 160 or 80km/h through the cab signalling system. This is imposed either via the signaller's workstation or by special switches provided in the line-side signalling rooms. This would normally be for a track condition, but can be used for other contingencies.

## TRACK SAFETY

CTRL has simplified its track safety rules by adopting a 'people-less' approach to track safety. All persons required to enter the railway, must hold a CTRL Licence and Berne key for the high security locking devices. Access to the railway is strictly controlled, with all individuals, or team leaders, required to sign both in and out by telephoning the EMMIS Controller.

All persons are forbidden to go on to the track unless protection is in place, with all train movements stopped.

The line has performed exceptionally well since it was opened, with fewer 'setting down' failures than predicted. The preventative maintenance policy is paying dividends with over 2750 maintenance possessions and 350 isolations completed. Over 21,000 Eurostar trains have passed over CTRL, with an average delay of 13 seconds per train.

Eurostar has experienced a step-change improvement in performance, with 89 per cent of services running within 15 minutes of their scheduled arrival time (a 12 per improvement on pre-CTRL figures).

Looking ahead, the challenge for CTRL is to maintain a high standard of performance as the date for the opening of Section 2 moves closer.

## THE INSTITUTION OF RAILWAY OPERATORS

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### HIGHER EDUCATION

By **Chris Daughton**, chief executive

We are about to sign a contract with Glasgow Caledonian University (GCU) for the Institution's education courses to be assessed, together with our internal tutorial and examination procedure, with the aim of being accredited by GCU to the standards required for Work Based Learning.

When this is completed, GCU will award a Diploma in Higher Education for the associate course and a Bachelor of Science Degree for the member course. Those IRO members who enrol in our courses will become students of GCU, with full access to all of the University's facilities, especially online. They will receive support by

telephone or face-to-face from GCU tutors, as well as those appointed by the IRO who have a railway industry background.

Any enquiries should be made to Mike Hill, IRO Education Programme at [education@railwayoperators.org](mailto:education@railwayoperators.org) or by phone to 01344 875328

### MEMBERS' NEWS

The following employers operate a corporate membership scheme, by paying a one-off annual fee, which covers all their employees' affiliate or associate membership subscriptions:

Network Rail, Eurostar UK Ltd  
ScotRail, First Great Western, First Great Western Link, One, Central Trains, EWS

Railway, Northern Ireland Railways, Freightliner, Virgin Trains, Northern Rail (FNW part only), Thameslink, GB Railfreight, Hull Trains, South Eastern Trains, Corus Rail Consultancy, Iamród Éireann, Arriva Trains Wales, Southern, London Line, Transport for London/London Underground Ltd/Docklands Light Railway, Stagecoach Rail (South West Trains, Island Line and Sheffield Supertram).

Those with full membership will continue to pay their subscription personally, irrespective of whether they can subsequently claim it back. As the IRO's subscriptions are tax-deductible, a receipt will be issued for all payments, whether by cheque, standing order or internet payment.

We welcome applications from all industry companies and associations to join up as corporate members – please contact Chris Daughton on 01444 248931 or [admin@railwayoperators.org](mailto:admin@railwayoperators.org)

### IF YOU ARE NOT A MEMBER...

Have you got experience of operating the railway? Would you like professional recognition, development and qualifications? The Institution of Railway Operators exists to provide a professional structure and qualifications for people with knowledge and experience of operating the railway, at all levels. Contact Claire Wickes at the above address if you would like a pack for yourself or colleagues.

## DIARY OF EVENTS

### NORTH WEST AREA

**Wednesday 16 March** Manchester  
Chris Leah, Chairman of the IRO and the North West Area AGM. In January, North West Area held a joint event with members of the C.I.L.T., at the offices of Merseytravel in Hatton Garden, Liverpool, to hear a presentation entitled: Merseyrail – A Model Railway? Tom Cox writes:

The presenter, Mr. Rudi Boersma (concession development manager, Merseyrail) explained the geography of the Merseyrail network. This was supported by some very interesting statistical information: 100,000 passenger journeys made each day; 205,000 trains per annum; 67 stations and 1,128 staff.

He then highlighted some of the factors that make Merseyrail genuinely different from all other Train Operators. Chief among these is their 25-year franchise, which, when Merseytravel is 'their SRA', means theirs is a partnership-approach to business on their own self-contained network. This gives a much more localised influence, allowing greater focus to effect speedy solutions.

Rudi illustrated Merseyrail's achievements in 2004, headed up by the best performance figures in the UK. The introduction of Penalty Fares in

August, along with the introduction of electronic gates at the six busiest stations, has had an almost immediate effect in reducing fraud, vandalism, and general disorder on trains and in stations. A major station improvement campaign was also being progressed, and Merseyrail's cleaning, security, and station environment standards were all above average, according to the National Passenger Survey of Autumn 2004.

Developments to be implemented in 2005 include the new Liverpool South Parkway, and the construction of the company's own wheel-lathe. Aspirations for the future include attaining full local control of the Infrastructure in partnership with Merseytravel, the introduction of a six-trains-per-hour service, having procured new trains, and the extension of the existing network towards Wrexham and Wigan.

After an interesting and informative question-and-answer session, to which representatives of Merseytravel contributed greatly, the audience recorded its appreciation of the excellent presentation, and thanked Merseytravel for their hospitality.

To contact the North West area on any matter, please contact Clive Evans on 01270-629009 or e-mail us at: [Northwest@railwayoperators.org](mailto:Northwest@railwayoperators.org)

### MIDLANDS AREA

Forthcoming events:

**Monday 21 March**

**Monday 25 April**

**Monday 23 May**

**Saturday 18 June**

To contact the Midlands Area on any subject, please call Julia Stanyard on 0121 345 5030 or e-mail: [Midlands@railwayoperators.org](mailto:Midlands@railwayoperators.org)

### SOUTH EAST AREA

**Monday 21 March** London

Ian Coucher, Deputy Chief Executive, Network Rail

**Monday 23 May** London

Operations for Dummies – Traincrew Management (Details to follow)

**Monday 25 July** London

Ann Bates, member of the DfT's Disabled Persons Transport Advisory Committee and the Rail Passenger Council

**Monday 26 September** London

David Franks, National Express Group

**Monday 21 November** London

All South East Area meetings take place at the Union Jack Club, Sandell Street, Waterloo. Doors open at 18:00 and the talks commence at 18:30.

To contact the South East area on any subject please e-mail: [Southeast@railwayoperators.org](mailto:Southeast@railwayoperators.org)

### NORTH EAST AREA

**Tuesday 8 March** York

White Rose - A Blooming Miracle – Robin Davis from GNER will talk about the project management of the introduction of a new train service, White Rose (Eurostar). Everything from satisfying the UK rail safety acceptance regime, dealing with route clearance, teaching drivers French, difficulties of the Yorkshire alphabet, being able to make a proper cup of tea on a French train and wash up on a train with no water. Venue: GNER Studio 1 accessed from platform 9 on York station. All North East Area meetings normally take place at 17:30 for 18:00, at York.

For further news on the IRO in the North East contact us by e-mail at: [Northeast@railwayoperators.org](mailto:Northeast@railwayoperators.org)

### SCOTTISH AND IRISH AREA

For information on all Scottish events and matters, please contact [Scottish@railwayoperators.org](mailto:Scottish@railwayoperators.org) or phone Jim Summers, Acting Chairman on 01324 625284.

### SOUTH WEST AREA

For information on all South West events and matters, contact Lawrie Hall on 01453 822150 or e-mail us at [Southwest@railwayoperators.org](mailto:Southwest@railwayoperators.org)