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PRESS RELEASE

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ImageMap Inc. is featured in the August 2004 edition of International Railway Journal (IRJ)

Measuring and predicting track geometry and rail wear problems and the elimination of reactive maintenance in favor of preventive maintenance is the theme of an article written by Mike Knutton of International Railway Journal. ImageMap's unmanned geometry measurement equipment installed on passenger service trains in the UK, is designed to frequently measure the same core routes at high speeds in order to heighten the safety and maintenance cost effectiveness of Britain's railway network.

****Note: Attached is a copy of the article that appeared on the International Railway Journal web site. The full article can be viewed in the August Issue of IRJ.*

International Railway Journal

Measure, Predict, Prevent

Planned preventive maintenance is making a major contribution to restoring the safety, reliability, and cost-effectiveness of Britain's railway network.

Mike Knutton
Senior Editorial Consultant

NETWORK Rail believes that people will look back on 2003-04 as the year when the railways turned the corner towards a future that delivers a much better service to passengers. So said Mr John Armitt, chief executive of Britain's railway infrastructure owner, when he presented Network Rail's (NR) results for the year to March 31. At the engineering level he pointed to:
• broken rails reduced from 444 the previous year to 334—the lowest level ever recorded
• reduction of temporary speed restrictions from 537 to 458
• 1373km of new rails laid, compared with 1010km
• 820km of sleepers laid, compared with 666km
• 806km of ballast renewed, compared with 665km, and
• 380 switches and crossings renewed compared with 254.

This also coincided with NR taking back in-house, first the engineering control of maintenance and renewals, and latterly much of the critical physical maintenance work. This followed a period between 1995, when NR's predecessor, Railtrack, farmed out maintenance to the private sector expecting cost reductions of the order of 30%, and 2003-04 when maintenance costs had actually increased by 50% in real terms.

NR currently spends about £1 billion a year on infrastructure maintenance and twice as much on renewals. After the traumas of recent years, NR engineers are now experiencing some financial stability to aid longer-term planning. This has coincided with NR regaining control over the state of the infrastructure and the condition of its inputs and outputs, and moving the basic strategy from reactive maintenance to something which is both predictive and preventive.

As NR's chief engineer, Mr Andrew McNaughton, put it: "We used to look for defects, find defects, and react to defects. Now, the philosophy is to measure, predict, and prevent." In rail grinding, for example, this goes so far as grinding rail to prevent cracks, not only to remove them once they have appeared.

The bedrock of the new policy is inspection, monitoring, and measuring, which has led to the adoption of new techniques including a world first for NR with an unmanned track geometry measurement system installed on a bogie of a regular scheduled passenger train.
"The old system was hugely inefficient because you had a standing army waiting for things to happen. It was costly, productivity was low, and planning was very poor," said McNaughton.

The key to predictive and preventive maintenance is knowing the condition of the asset (NR is, after all, an asset management company whose customers are the train operators). And the key to knowing the condition is frequent or very frequent inspection and measurement. Actual inspection intervals are asset-specific. For example, bridges, of which NR has the largest portfolio in Britain with 65,000 spans, generally need checking only once a year, while some track requires weekly inspection. "When the condition of a bridge gets close to the safety level we can start to step up the frequency of inspection. That is a risk-based frequency regime," McNaughton said.

Network Rail's New Measurement Train is crammed with equipment for track geometry data.

The big maintenance challenge for any railway is track wear and McNaughton's strategy has been to replace the subjective judgement of visual manual inspection with mechanised measurement of track and overhead line geometry, rail integrity, and component condition wherever possible.

Inspections are carried out by the world-first system onboard a Chiltern Trains' dmu that was introduced as a pilot project last summer, a canary-yellow converted High Speed Train called the New Measurement Train (NMT) that also entered service last summer, and other measurement trains. Main lines are covered at least weekly and commuter and main secondary routes every two weeks.

The Chiltern train inspection system, supplied by ImageMap, United States, became possible through the continuing miniaturisation of technical equipment. Equipment on the NMT is still housed in substantial cabinets that could never be accommodated on a revenue-earning passenger train. "The American technology fits in a 'shoebox' yet provides the same geometrical measurements with the same repeatability, run after run, unaffected by train speed, as a full-scale track recording train," enthused McNaughton.

The frequency of measurement can be as often as the train runs. During trials with the Chiltern train, measurements were carried out four times a day! "That was a bit over the top," conceded McNaughton, "We need to do it weekly." The masses of information gathered are transmitted to a special office in Derby, the Engineering Support Centre, where it is filtered and passed on to the relevant engineer in a form and quantity that is relevant and manageable.

"We realised very early on that a track engineer responsible for a couple of hundred miles of track could easily be deluged by data that would turn his bit of the railway into a paper nightmare," said McNaughton.

Using the new system means that planners are no longer looking for defects but for trends that enable intervention before the safety limit is reached. One significant advantage is that a special train path is not required for the measurement process and, as McNaughton put it, there are "not as many white coats about". Neither is it necessary afterwards to send out an inspector with a clipboard to see that the remedial work has been carried out properly because subsequent measuring provides the information. But, while the measuring can tell what is happening, it still cannot tell why it is happening.

NR is on target to have unmanned geometry measuring on all lines carrying traffic operating at 160km/h or more by the end of the year. ImageMap equipment is being fitted to pairs of trains, for example two Great North Eastern Railway (GNER) High Speed Trains, two tilting Virgin Pendolinos, and two Virgin Voyagers, so that work can continue should one train be withdrawn from service for any reason.

Tangible benefits so far from the Chiltern operation include fewer speed restrictions, fewer rail breaks, and fewer bumps, all of which can be quantified to the customer. It has also led to a reduction in NR's insurance premiums. Staff productivity has also increased through greater efficiency of the work process, though the exact level is still being quantified.

The full article can be read in the August issue of IRJ

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