

R

0

M A G A Z I N E The latest news & reviews from the industry

0

0



**US** Predictive Maintenance – An Under-used Resource

We Need to Level with You – Stop, Look & Listen is Not Fit for Purpose

**RAIL LIVE 2017 REVIEW - ISSUE THREE 2017** 

# At the heart of the rail industry supply chain

• •

- Regionally Northern Powerhouse, Midlands Engine for Growth & others
- ➢ Nationally England, Ireland, Scotland, Wales
- ➢ Internationally DIT Trade Challenge Partner

The Rail Alliance is the largest B2B membership organisation providing:

- ➢ Events & networking
- ➢ Route-to-market advice
- ➢ National rail test & trial opportunities
- ➢ Dedicated industry support programmes

Partnering with the Rail Supply Group to make every link count

Membership starts from £500 per year









#### www.railalliance.co.uk

Frailalliance

#### The Rail Alliance

The Control Tower, Quinton Rail Technology Centre, Station Road, Long Marston, Stratford-upon-Avon, Warwickshire, CV37 8PL.

Email: info@railalliance.co.uk Telephone: +44 (0)1789 720026 Twitter: @therailalliance

#### Working with Rail Supply Group

## Letter from the Editor

In this issue we take a look back at RailLive 2017, which took place on 21–22 June.

We interviewed Lucas Young from Axis Communications, one of the event's sponsors, about predictive maintenance.

We also have an in-depth interview feature for you about level crossings. We spoke with Martin Gallagher who has worked on the matter with the UN. We had a long and frank conversation about the state of level crossings in the UK, the increasing pressures these road-rail / pedestrian-rail intersections will face in the future and the obstacles and difficulties that mean unfit systems are not being replaced. A really worthwhile read and in many ways symbolic of the rail industry as a whole.

This time around our next magazine will be published in just one month's time in time for Railway Interchange, which will be held in Indianapolis, Indiana, USA on 17–20 September. It is both a railway exhibition and technical conference and features an outdoor exhibition space. The show is held every two years. In 2015 42 countries were represented with almost 10,000 registered attendees. There is a \$75 discount for attendees registering before 9 August. If you are going and would like to be represented in our magazine, please contact Andrew Lush at **al@railway-news.com**.

As always we look forward to hearing your feedback and reading your contributions so that we can continue to be a platform for news and lively debate around all things rail. We're excited to have new projects up our sleeve so watch this space for some exciting new developments. In the meantime please enjoy our 3rd issue of 2017; read our informative interviews and catch up with the latest supplier news.





ANDREW LUSH Director al@railway-news.com

#### **JOSEPHINE CORDERO SAPIÉN**

Editor-in-chief jcs@railway-news.com

NICOLA BROWN Head of Sales nb@railway-news.com

AMBER GUY-KEMP Head of Client Content agk@railway-news.com

> GUY RAYMENT Graphic Design

A2B Global Media Ltd Third Floor 11–15 Dix's Field Exeter EX1 1QA United Kingdom

**Office:** +44 (0)1392 580002 **Mobile:** +44 (0)7432 725001

**Email:** info@railway-news.com **Website:** www.railway-news.com

If you would like to submit editorial content, or you are interested in giving an interview for the magazine, please contact **Josephine Cordero Sapién**. If you would like your company to join Railway-News's online platform, please contact **Andrew Lush**.

To subscribe to our newsletter, visit **www.railway-news.com**.

COVER: ©Railway-News



## THIS IS PARKER

On track for reliability and performance Enhancing performance of existing rolling stock and addressing future challenges including energy recovery, storage and management

Parker's unparalleled expertise in the rail industry means they can offer innovative solutions to address the 4C's of Cost, Carbon, Capacity and Customer from the perspective of train operating companies, vehicle builders and owners.

We're ready to take your challenges from concept to reality; addressing performance, reliability, application weight and space.



ENGINEERING YOUR SUCCESS.

rail@parker.com parker.com/rail



## Contents

#### **INTERVIEWS**

**p.12** We Need to Level with You – Stop, Look & Listen is Not Fit for Purpose Railway-News sits down Martin Gallagher, UN Safety Committee Chair & Director Global Level Crossing Services, to find out about the state of level crossings in the UK and the challenges with moving forward with innovations.

#### **p.27** Predictive Maintenance – An Under-used Resource We spoke with Lucas Young from Axis Communications, a sponsor of RailLive 2017, to learn more about predictive maintenance, prescriptive maintenance and how the rail industry should use cameras more.

#### **SUPPLIER NEWS**

p.38 Armacell ArmaFORM® PET Foam Core Perfectly Fulfils Rail Industry Needs

- **p.20** Bender UK Early Identification of Faults on Rail Signalling Power Systems Driven by New Standards
- **p.22 CML** CML Innovative Technologies Ltd – An Introduction
- p.24 Parker

Sharing the Journey

p.30 Phasor

Empowering the Digital Railway

#### p.32 Windhoff Bahn- und Anlagentechnik GmbH

Windhoff MPV for Northern Ireland Railways (NIR)

#### p.35 UPCOMING EVENTS

July 2017 – September 2017



## Rail Live 2017 in Review

## Quinton Rail Technology Centre, Long Marston, in Warwickshire

LOCATION MAP Praillive 2017

This year's Rail Live, held at the Quinton Rail Technology Centre, Long Marston, in Warwickshire on 21–22 June is an annual event that aims to cover the whole of the rail sector, featuring everything from signalling, electrification, infrastructure, rolling stock and more. This year it was able to boast 273 exhibitors and more than 6000 visitors over the two days, more than double on both counts compared to 2016, with 93 exhibitors and 3000 visitors. It was the fifth time this event was held and it is clearly going from strength to strength. The opening day will surely be remembered for the absolutely blistering heat. With plenty of water available, a free breakfast courtesy of Bridgeway Consulting Limited and even a slushy vendor on site, everyone was set to enjoy the event.

enix

#### Rail Live Demonstration

ante -

CH

Demonstration highlights included:

- Track renewal by Amey-Sersa And Rhomberg-Sersa (S&C)
- Electrification by Balfour Beatty
- Screwpiles by FLI Structures
- Welding innovations by Thermit Welding
- Ballast vacuuming by Railcare Sweden
- An anti-graffiti coating demonstration by Impreglon UK

Large and small rapiddeployment fan units for tunnel ventilation by Factair

0

INTERFLON

ailway-news.com

#### Rail Live Dinner

The evening of the first day featured the Rail Live dinner, sponsored by Shannon Rail, at the Stratford Manor Hotel. Steve Davis OBE (former professional snooker player) and comedian Josh Daniels both spoke at the dinner. Another element of the dinner was the Network Rail / Rail Live 2017 Awards with the following categories:

Best-performing small plant supplier

Most innovative small plant Most improved RRV supplier

Power Saving Sol

Best-performing RRV supplier

1

- Most innovative **RRV**
- Continuous improvement award
- Share with pride champion
- Plant engineer of the year award
- Plant safety champion
- Plant operator scheme champion
- Best supporting organisation in 2016/17
  - Rail PPS root cause analysis

#### **Rail Live Conference**

The rail industry is a growing market, both for passengers and freight. Rail Live hosted a number of seminars to address the challenges and opportunities of the future and help shape business strategies. The four sessions held over the two days covered the topics 'the digital railway', 'skills', 'electrification' and 'light rail'. Speakers came from Siemens, the National Skills Academy for Rail and the National College of High Speed Rail to provide expert insights into a broad and important range of topics.







tanton

CONSOLIS SBC RAIL

#### **Business and Networking Zone**

Networking is a vital tool in growing ideas and producing fruitful partnerships. This area was invaluable for visitors and exhibitors by giving them access to organisations supporting the rail sector, such as the Department for Transport, Department for Business, Energy & Industrial Strategy, the Young Rail Professionals, the Department for International Trade, the Rail Supply Group, the National Skills Academy for Rail and many more.

With so much packed into just two days, we hope you had a productive, enjoyable visit and you'll be back at RailLive 2018, which will only be bigger and busier.

4

Fil

SCIN SCIED

ovative Precast Concrete Solutions





## We Need to Level with You

#### Stop, Look & Listen is Not Fit for Purpose

We've run a number of stories about level crossings lately. Stories about new audible warning devices installed by Network Rail in the UK to make level crossings 'safer', about Network Rail's Signly app to support people with visual, hearing and / or mobility impairments navigate level crossings, about International

Level Crossing Awareness Day, stories about Union Pacific's outreach efforts after the US Department of Transportation found 94% of public railroad crossing accidents were the result of risky driver behaviour. The US DOT launched a campaign called "Stop! Trains Can't!" to help reduce the number of fatalities. We

#### By Josephine Cordero Sapién

received a lot of comment on this last news item in particular so we decided to delve further into the level crossing world and find out the lay of the land. We spoke to Martin Gallagher, the UN Safety Committee Chair & Director Global Level Crossing Services. Here is what he said:





**Railway-News:** Do you want to start by introducing yourself and give us some background information? How are you involved with level crossings?

Martin Gallagher: I was Head of Level Crossings for Network Rail for 3 years; Network Rail is the biggest rail infrastructure manager in Great Britain, and one of the largest in Europe. And from that, I also chaired the United Nations Experts Committee on Level Crossings and Level Crossing Safety. I've done that for 4 years, and have been working as an adviser or consultant to a whole range of infrastructure managers and system developers across the world, helping them to develop systems to reduce risk, improve safety and improve performance at level crossings internationally.

**RN:** There are roughly 6,000 level crossings in the UK. Starting from a sceptic's perspective, what's the main issue? The number of level crossing deaths in a year in the UK was recently reported as 2. Why should I be

#### concerned that they are a problem to begin with?

MG: If you look at these issues solely in terms of the number of fatalities, yes, the numbers are currently low, and very low compared to road deaths. People always confuse level crossings with safety concerns. There are safety concerns, but one of the reasons to be concerned is the level of demand for rail across the world. In the UK demand is rising by something like 7% per year. The demand for road and the volume of vehicles are increasing also. The latest polling from the Department for Transport in the UK for example suggests that the number of vehicles will double by 2040. So we have a simple equation: more trains, more people, more passengers, more people using roads and growing populations. And the one place that all of them intersect in the railway is at level crossings. So the reason why people should be concerned is because with demand growing on all sides, level crossings are a bottleneck and tens of thousands rail crossings across the world are not equipped for large numbers of users.

**RN:** Is this primarily an efficiency concern of traffic coming to a halt at

#### level crossings or a safety concern?

MG: Those things are interdependent. If you look at the type of level crossings in the UK, fewer than half of the level crossings are protected by audible warnings, lights and barriers and the majority have no protection at all. They are simple trails across the railway or gates that open on to the railway with no signalling, and no controls other than the 'Stop, Look and Listen' sign. The unprotected level crossings may have speed restrictions imposed on them, because they have sighting and safety concerns. If you keep multiplying these up and saying, 'We're going to have more trains using those lines,' then you'll change the risk; it creates a greater risk, which will create more human factor issues, more accidents, more delays and congestion. These crossings are not fit for purpose now let alone for more usage.

**RN:** If a rural level crossing becomes an urban one, then obviously you would have to adapt the level crossing to cope with the added demands. Is there not a measure then that works that we already have? We could just make

#### the unprotected ones be like the protected level crossings that we already have, surely?

**MG:** That's unaffordable. There currently are very few affordable solutions to address this problem. And that's part of the issue. The business case at the moment to improve the levels of protection at all of these unprotected crossings, only creates a small amount of spend. The cost of installing warning systems at level crossings, for Network Rail or anybody else, is tens if not hundreds of thousands of pounds, occasionally millions where resignalling is required. There simply isn't the funding at the moment to increase protection. But that's also assuming that there are solutions out there. There are also not very many solutions because of another massive issue, namely the supply chain issue with Network Rail, in this country. The development from concept to market, from concept to operation, the development cycle will take at least three years and the risk is with the developer. That adds a huge amount of cost into your eventual product and means that the majority of the small innovative companies that are agile and can deliver things or offer solutions at lower costs may drop out. They can't afford to take the risk. They can't afford long development cycles, where they're not guaranteed to sell a single unit. So for solutions with the level of safety integrity required to meet challenging technical specifications you're left with a much smaller number of larger companies who then develop relatively expensive solutions that Network Rail can't afford to put into 90% of unprotected crossings; Therefore you have this vicious circle where

what you're left with is crossings that remain unprotected and a frustrated supply chain.

## **RN:** Everything remains as it is because there's no ideal way forward.

MG: There is an ideal way of moving forward but it requires lots of different changes. 5-year funding cycles are not ideal when trying to plan a long-term strategy. Yes, you can make some longerterm policy statements but that's different to a funded strategy. The pace of innovation means it is difficult to develop a solution and implement that and then measure the effectiveness in order to demonstrate the business case to the regulator for more funding next time around to continue into the next control period. And delivery of new schemes effectively stops for the last 18 months of each control period as work has to be completed within that control period. Suppliers also want to know what the market opportunity is before committing. All too often the figures and volumes are too vague. This stifles genuine innovation.

## **RN:** How does the rail regulator come into all of this?

**MG:** The rail regulator sets deliverables and can make recommendations that Network Rail are required to deliver unless they can come up with a justifiable reason not to. The rail regulator can look at an issue like unprotected rail crossings and say a variety of things to Network Rail, "The technology exists to provide a reasonably practicable automatic warning system" or after an investigation 'We're giving you a recommendation that says that you will implement some kind of



warning system or...' whatever the specification is. All of these things are solvable. If you believe that exposing elderly people and children to trains travelling at 100mph and asking them to judge the speed of that train before crossing is the best we can do, I'd have to disagree.

**RN:** What does the rail regulator say at the moment? Do they believe it's not an issue and it won't be an issue, they're not convinced? What is their standpoint?





MG: The rail regulator recognizes that it is an issue, but also recognizes that there's limited spending. They feel that, 'Yes, in a perfect world, having unprotected crossings isn't ideal. Network Rail are trying to do something about this but too clumsily and slowly.' In this country, Network Rail have over 1500 crossings that are protected by a whistle board. This is where the means of protection and the crossings are inherently unsafe. There isn't enough time at many of these crossings. The time it takes to traverse a crossing is more than the time there is between when you first see the train and the train arriving. So a

train driver is required to sound a horn to warn that a train's approaching. There are so many points of failure in that process that Network Rail have a presentation on it.

# **RN:** That's a quarter of the crossings in the UK. You would imagine there would be much more in the way of accidents, surely?

**MG:** At these crossings a train driver has to sound his horn, and the person standing on the

crossing, maybe hearing impaired, walking the dog on the crossing is supposed to be able to hear that without seeing the train and to recognize that that means there's a train coming; Network Rail themselves admit that this is an ineffective warning system or protection system. But the rail regulator appears guite prepared for Network Rail to now put out a development tender opportunity to the supply chain to say, 'Over the next three years, we want to address this issue and by 2025 we want all of these whistle boards removed.' Well, that means we're not going to see improvements for at least three years. And I

understand what you're saying about 'Why aren't there more accidents?' The only explanation I can give is, people must be good at avoiding being hit by trains. Because you would not let your child or your elderly parents use those crossings if you knew that the time to traverse them is less than the time available once you could see a train.

## **RN:** How much time would I have to get across one of these crossings?

MG: That depends on the crossing, but the science behind it is all so assumptive. How quickly can people walk? Who is using the crossing? When are they using it? What are they doing whilst they're using it? Do they know what they are supposed to do? Furthermore, I have been approached by contractors recently who have been awarded work to carry out risk assessments at level crossings. They didn't have any expertise in this area but had won the work anyway. If that's happening, what decisions are going to be made about those locations? The operational staff are so dedicated but they require more help and better management and procurement to solve these issues.

## **RN:** Where there are sighting and safety concerns, trains have speed restrictions.

**MG:** Speed restrictions are the worst-case scenario for the rail industry. They'll try and avoid those of course. What they'll rely on is measures like additional telephones or whistle boards and they might implement a shortterm emergency or temporary speed restriction.

#### **RN:** If Network Rail want the trains to go fast, and they want trains going closer together, they want increased capacity, then the fatalities won't even come into it for them.

MG: That's why it's a mistake to only use the safety argument. You could say 'Look, we'd just like to run all our trains at line speed rather than have this issue of having to slow trains down.' All those things are recognized, but not enough is done about it. Network Rail would say, 'we're doing things. We just put out a tender for a warning system, even though it's going to take three years to develop...' But the reality is that level crossings haven't changed the way they look in a hundred years; 4000 unprotected crossings across Great Britain haven't changed at all. Go to them, look at them, they haven't changed. People are still being asked to traverse, cross railway lines without warnings, with trains travelling at over a hundred miles an hour.

**RN:**What surprises me is that this isn't just a British problem with its rail system. There aren't examples where we could say, 'Look at what Sweden is doing, that works really well. It's cheap. Let's do that.'

**MG:** In some sense you're comparing apples with pears when you compare different countries. The safety integrity level varies. It's very high in the UK. Other countries are more pragmatic. But in general most countries that have railways have lots and lots of unprotected crossings and, in general, there are very few solutions, and nobody's doing a huge amount about it. And if you look at the work that we've done at the United Nations over the last four years, we are publishing a report that basically says the same thing.

## **RN:** It sounds like perfect is the enemy of the good here.

MG: That's exactly what it is. We want this high-level safety integrity solution that we can't afford, but if you provide us with something that's less than that but is better than nothing, then sorry, we won't have one of those things. Part of the challenge is that the commercial staff and even the engineering staff do not feel the same pain as the operational staff. I can understand why a high level of integrity is required but all three elements have to work more closely together to provide solutions more quickly and more costeffectively.

**RN:** Looking towards the future, do you think what's really going to happen is either we have to get to a place where fatalities really start going up, or the system becomes so unworkable that at that point, they will spring into action, but too late?

**MG:** Probably your first point. There needs to be a tipping point. Back in 2005 in the UK, there was a double fatality of two young girls at Elsenham Level Crossing. And that drove improvements and changes over the next 10 years. Now, we've had a period of calm. Unfortunately it might take a high-profile accident before we see another huge amount of activity that says, 'this isn't good enough; we have to do something about it.'

#### **RN:** Prior to this I had thought of level crossings as always having barriers and lights.

MG: And people will identify with what they're familiar with in their own local environment. If people knew that there were all these unprotected crossings where you have to put on speed restrictions and you have to put in whistle boards, that you have to rely on so many possible errors in the chain not happening: whether the train driver remembers to sound the horn, whether the person hears it. There's even a ban on the times you're allowed to use that train horn. You're not allowed to use it between 11pm and, now, 5am in the morning. And there's no formal protection. People would say, 'Trains don't run then.' Oh, but some do. And some people walk their dogs at 4am.

**RN:** There would be no need for a ban on train horns if no trains were using the lines, because what noise would you be banning?

**MG:** More people work in shifts these days. If you decide to walk your dog at a whistle board crossing at 4.30am, you'd better hope there's no engineering train or an early service or a freight train.

Let me give you another example. On certain lines, you have crossings that are manuallyoperated by the user. They have no protection; they're just gates. You drive up with your vehicle, and you're required to open the first gate. You have to then look to see if a train's coming. You walk across the railway line and you go and open the far gate. And then you have to turn around, look back, see if a train's coming to cross back and go and get in your vehicle and you go through the whole process again, closing the gates. In some of these locations, a telephone is provided for you to speak to the signaller, to ask if you can use the crossing. Most people would presume that what the signaller is doing is checking to see if there's a train in the area before giving you permission to cross. But these crossings are often in what we call 'long signal sections'. There's no way for the signaller to know where the train is, other than knowing it's in that section. So he can have a 10-mile section of track where he has no capability to identify where the train is exactly. So you get people using these telephones, and the signaller says to them, 'Has the train passed you yet?' The person says, 'No.' He says, 'Well, you have to wait till the train passes you before you use the crossing.' And then they'll say, 'How long will that be?' And the signaller will think but probably not say, 'Oh, I don't know. I don't know where the train is.' As a result people who regularly use those crossings don't bother to use the phones because they don't get back any useful information.

People who do use the telephone at the crossing, maybe a first-time user or somebody who's really compliant, experience high levels of frustration, because if you read accident reports, people report waiting times of over 15 minutes for a train to arrive. They're sitting in their vehicle, often a

commercial vehicle, maybe delivering something to a local factory on a Friday afternoon. They're being asked to sit there on a single-track railway and wait for 15 minutes for a train to pass, even though they've called the signaller and asked for some useful information to help them cross; and then, to sit there again for another 15 minutes, 5 minutes after they've dropped off their delivery and wait for the train to pass again. At a place called Sewage Works Lane in 2010, the driver decided not to wait; he crossed the railway line and he derailed the train. People wouldn't believe that there's no technology better than a telephone with somebody at the end of it saying 'Wait till the train has passed.'

**RN:** I suppose people get frustrated after waiting for 10 minutes and then decide to cross, increasing their risk further because the train is now much closer.

MG: That's exactly what happens. Occasionally, the signaller makes a mistake; and says, 'It's okay to cross.' There was an accident in the East of England last May, where the signaller appears to have given some incorrect information and the train struck a vehicle on the crossing. These things happen and it's not that unusual. Most people don't know these things and they think that a country that's spending 70 billion pounds on high-speed rail wouldn't have the methods of operation at some of the highestrisk locations for train derailment and multiple fatalities in the country - rail crossings. They are Network Rail's biggest area of corporate risk, because they're

the only very predictable place where you have that high level of multi-fatality accident train derailment.

#### **RN:** Speaking of highspeed rail, what systems get put in place there?

**MG:** It's very unusual for any new railway line to include a rail crossing, because at that point of design, it's much less expensive to include an underpass or a bridge. They're being designed out. The situation becomes unaffordable when you have crossings already on residential streets because you'd have to buy all the local businesses and houses to build an underpass or a bridge.

#### **RN:** I suppose the 'positive' then is that the number of level crossings at least isn't going up.

**MG:** Yes, but the overall risk will I've been asked why I didn't solv go up and what will happen is that this when I was at Network Rail.

there will be a high-profile accident, and suddenly there will be a major focus on it and they'll be asking people like me and everybody else; the media will be saying, 'What do you think about this?' We'll be saying, 'We've been telling Network Rail for the last 20 years that this is a massive problem, a legacy issue that they're storing up.' But, like I said, the solution has so many interdependencies; because it doesn't just require Network Rail to decide that 'we're going to do something' in safety terms. It also requires them to look at their procurement processes, their commercial processes, the timescales for introducing technology, their policies around the types of technology they use, their capability to try and understand different technologies; because the rail industry is very conservative, and most of the engineers in the rail industry are signalling engineers. I've been asked why I didn't solve

The answer to that is simple. We spent three years improving the organisational capability to enable this risk to be managed more effectively. Creating the post of level crossing managers, removing paper-based systems, cleansing data, introducing mobile working and training for staff, closing crossings and introducing incremental improvements. This drove risk down by over 30%. The next step was to develop more technology solutions for the toolkit. Priorities changed and the focus fell on closing a relatively small number of crossings rather than looking at how to improve the majority of crossings that remain.

Signalling-based solutions are too expensive to be pragmatic or practical for most rail crossings, because of the whole life cost of them, because they're expensive to design, they're expensive to install and they're expensive to maintain. But the reality is Network Rail doesn't have the



capability in-house to look at other disruptive technologies because their engineers are not experts in these technological fields. Most of these crossings don't have mains power. They say, 'We can't get power to those locations, so we can't put anything in there.' Everybody's using renewable power solutions these days, but again, it's not an area of expertise or capability for a signalling-based organization. So when you start to unveil all of these layers of the problem, it's a big thing to address. The problem is that the culture is very defensive. Objective challenge, particularly from outside is viewed very negatively. Challenge from inside generally results in a career choice. It's a bit of a self-fulfilling prophecy; a lack of challenge results in a lack of innovation and change.

#### **RN:** It sounds pessimistic.

MG: Yes, and we haven't even talked about road crossings. Already at some locations during peak times, the barriers are down for more than 45 minutes per hour. What are Network Rail going to do when they're running more trains? What are we going to have, 55 minutes in the hour; for these crossings to be closed? And you know the type of automatic crossing that they use -- half-barrier crossings at many of these locations -- the rail regulators already said 'There are over 500 hundred automatic halfbarrier crossings on our public roads. We do not want to see you renewing those high-risk crossings "like for like."' But Network Rail don't have any other solution other than a fully controlled crossing and that will often mean new signals and millions per location. They're halfbarrier because they're fully automatic and not monitored so

there would be a risk of trapped vehicles or people in the crossing if you closed off the whole road. Another area, another massive problem and it keeps happening. There is only one approved supplier of obstacle detection systems for crossings. The current network strategy relies on the removal of manually controlled crossings and replacement with OD crossings – but the current and only approved supplier has failed to make it through the prequalification for supply of the next 400 systems. However, there is an ongoing delivery plan and there will be a sizeable gap for development and acceptance processes between now and the next generation OD being available to operational staff to use. So presumably Network Rail will continue buying and installing systems that have failed to even qualify to be invited to tender stage. There is also the issue of the proposed closure of the Honeywell factory in Germany in January and any ongoing support for the current 200 odd systems procured.

## **RN:** Surely, it would be cheaper and easier if this was sorted it out in advance.

MG: Yes, unplanned expenditure is the most expensive part of expenditure. That's what will happen if a train derails in a location with an unprotected crossing. Or an issue with somebody not using the telephone, the Rail Accident Investigation Branch will, this time, make a recommendation to the rail regulator that says, 'Network Rail will need to develop a solution to this now.' And maybe, if it was really highly political, they'd go back to crippling speed restrictions.

#### **RN:** If this became acute because of a major accident, surely there'd be extra funding from the Government as well.

**MG:** The funding would be made available, I am sure. There'd be some pressure put on Network Rail to find or reallocate budgets, but in general, the funding wouldn't be an issue. What would be an issue is actually delivering the solution in any kind of time that was acceptable to the train operators, for example, who would be having to reduce services or whatever the impact on them, as well as the safety side.

Martin and I concluded the interview there. Having delved into this issue with him, I was left somewhat speechless. Not in the sense of shock as such, but just with a 'well, it is what it is' fatalism. I can see why level crossings haven't been tackled. It seems like a problem that's not straightforward or simple to solve and one that requires a lot of coordination and collaboration between many big organisations. It's just easier to reduce the number of hours a train can't use its horn at night and call it progress. Especially with legacy issues such as level crossings. People aren't dying. It's easy to bury our heads in the sand. And this isn't even an issue specific to level crossings. The rail industry as a whole is so slow to change. Even the most passionate advocates of innovation and improvement can be worn down by the resistance to doing things differently. The barriers to change just seem insurmountable when the only barriers that should be insurmountable are the ones on level crossings.

## Early Identification of Faults on Rail Signalling Power Systems Driven by New Standards

Tony Edwards, Industrial Sales Manager at Bender UK, has specific responsibility for the rail sector; he looks at how increasing demands for more effective identification of faults is shaping more sensitive and responsive monitoring.



Every day rail maintenance crews face the challenge of ensuring that the power systems for operating signalling systems are free from faults to ensure that there is no interruption of service.

Faults inevitably occur due to a natural degradation of the infrastructure or other common causes such as rodent damage or water ingress.

The maintenance teams are set targets to rectify those faults – but they can only be achieved by deploying technology which helps them to identify earlier and more accurately where those faults are occurring.

The ideal scenario is technology which gives them early warning of faults that are not yet critical – providing a breathing space to plan and deliver predictive and preventative maintenance solutions.

The new standard for those products from June 2017 is detailed in the Network Rail Level 2 Product Specification: Insulation Monitoring and Fault Location Systems for use on Signalling Power Systems. It sets out Network Rail's vision for Insulation Monitoring Devices (IMDs) and Insulation Fault Location Systems (IFLS) comprising their system requirements, network monitoring architectures, and IMD and IFLS capabilities along with requirements for portable models, and the integration of devices with Network and earth fault location system. Rail's Intelligent Infrastructure systems.

The document explains that the changes are designed to drive the development of new technology to provide additional parameters, for example capacitance, to assess the safety of the signalling power system and further reduce the risk of electric shock. It also states that it wants to improve detection of signalling power cable failure before it interrupts a power supply leading to loss of signalling, and improve the ability to pinpoint the position of faults to drive reductions in time and the disruption caused by signalling power cable faults.

Network Rail believes better monitoring will ultimately drive reductions in OPEX and CAPEX costs, enable the deployment of alternatives to more expensive auto-reconfiguration systems and extend the life of existing cables and networks.

Bender UK is currently the only UK supplier with approved products to meet this requirement and the company has worked closely with its principal contacts at Network Rail to shape the development of the technology to meet the new standards.

One of the key requirements is the need for enhanced sensitivity to narrow down the area where a fault is occurring. Bender has responded with the new upgraded RS4 integrated insulation monitoring



It is more sensitive than the widely deployed RS3 and enables 'first fault' location (100 kilo ohms) before the fault becomes critical. It also measures capacitance, voltage and frequency, delivering more information to help assess the health of the system.

The insulation-monitoring device within RS4 enables fault location at Tier 3 electrical system network level for the signalling system. It has proved very effective in meeting the 'Red' requirements within the standard, which must be complied with and achieved at all times.

Farth fault location is the effective solution for sub-network Tier 2 monitoring to assist in locating the fault on a circuit, a key element in the Amber requirements within the new standard.

The RS system continually monitors insulation values to show the realtime status of the power system. When the insulation value (IR insulation resistance) drops, the system records the fault and the Bender units put a test current signal or pulse into the system, which is pulled to earth at the point where the fault exists.

The new RS4 unit is much smaller and more compact to make it easier to incorporate in the panels serving systems that are operating at a lower power rating. Later this year, a variant will be available that is tested and ready for easy 'plug and play' installation and commissioning alongside existing power infrastructure systems up to AC650V.

Integration of RS4 devices with Network Rail's Intelligent Infrastructure systems is achieved by incorporating GSM-enabled data loggers equipped for real-time communication to deliver immediate notification of insulation 01229 480123.



Protection Device RS4

faults which are identified by the system.

Once the fault has been identified on a specific circuit, the portable Bender EDS3090 unit is used trackside to pinpoint the location by monitoring the pulse on the trackside cable. In line with the new standard, Bender has made significant improvements to the EDS3090 unit which has more sensitive clamps and receiver technology.

The unit is self-powered through connection to the trackside signal electrical network. It delivers livemonitoring of the system status to immediately indicate if there is an earth fault and what the status of the insulation is. The portable unit can also be used to provide independent verification of the RS system performance.

The new RS4 is just part of the huge Bender rail offering which includes power quality meters, insulation monitoring devices and monitoring software for rolling stock, signal power, points heating and trackside use.

For more information, contact Tony Edwards: tony.edwards@benderuk.com or call Bender UK on

#### railway-news.com

## **CML Innovative** Technologies

CML Innovative Technologies, part customers such as Boeing and of the lighting business unit of Grupo Antolin, is one of the largest worldwide suppliers of miniature lighting solutions, having approximately 2,000 employees and an annual turnover in the region of €350m. Together we are a vertically integrated designer, manufacturer and seller of one of the widest selections of miniature lighting systems and components in the world.

In addition to supplying traditional lighting technologies to

Airbus, CML has been at the forefront of the introduction of LEDs with an early developmental highlight being the incorporation of LEDs into stamped metal circuits. Continued innovation has seen light guide technology develop from the dashboard into complex ambient lighting solutions. CML light guides can now be found in almost all of the world's premium vehicles including, but not limited to, BMW, Mercedes, Ferrari, Rolls-Royce and Audi.



CML is expanding its portfolio by developing additional lighting solutions for the railroad sector. CML's key strengths to help bring the best technical solution to market include:

- World class R & D and innovation capabilities
- Advanced design software with integrated optical simulation
- Advanced electronics design and thermal simulation capabilities
- In-house laboratory and test facilities
- In-house tooling capabilities with industrialisation (for example, injection moulding and automation)
- **Global production facilities**
- Automotive standard project management techniques
- Strong links between technical and commercial teams

#### railway-news.com

#### Notches for light extraction



After very successfully exhibiting at InnoTrans 2016, CML is pleased to announce that they will be exhibiting at the Railway Interiors Show in Prague on 14 and 15 November.

The stand will include examples of CML's collaborations with major rail industry suppliers as well as further ideas, examples and solutions.

On show will be some of CML's existing range of IP68-rated LED indicators which can readily be adapted to provide illumination for applications including steps and entrances. Features such as colour and intensity can be adjusted to meet specific customer requirements whilst features such as flashing can also be incorporated. As many rail industry insiders will be aware, CML already produces a range of rail parts approved to DIN EN 50155, AAR S-5515 and S-9401 specifications.

Seating featuring integrated lighting will also be on show as a further example of CML's capabilities. This lighting will utilise high-reliability, touch sensitive switch technology. Such technology offers many advantages such as flexible location options and the potential to add additional functions such as intensity variation or colour adjustment.

Visitors will also be able to see examples of CML's light guide technology which can be used to create accent and ambient lighting and can also, in conjunction with CML's colour changing light engines, be used to reinforce brand awareness.

There will also be the opportunity to see some of CML's large range of LED modules. These can be used to provide additional ambient or emergency exit lighting.

CML has a long history of assisting customers, in very demanding markets, to develop lighting solutions, whilst benefitting from the economy of scale of established technology. Whether your requirements are for interior applications such as seat lighting, cabin lighting, entrance lighting or exterior applications such as sealed beam lamps – CML is the company to talk to.

#### www.cml-it.com







# Sharing the Journey

Parker's long association supporting motion and control technology for rail makes it the ideal partner to solve the challenges of the future.

Celebrating its 100th anniversary this year, Parker Hannifin has established itself as a global leader in motion and control technologies and has been supporting and helping to drive evolution of passenger and freight rolling stock and locomotives with its pneumatic, electromechanical and drive  $\vartheta$  motor components and systems for almost five decades.

Throughout its history, Parker's broad range of market and technology expertise in transportation has been developed. This not only covers rail, but also automotive, truck and bus, marine, aerospace and space travel. Such a breadth of knowledge provides a solid foundation for driving innovation that will support the rail industry as it grows and adapts to market and technology changes and challenges.

#### Designing for the most challenging application environments

Parker's extensive offering of innovative, robust, durable products and system solutions with proven quality and reliability fits well with the extremely challenging operating environments synonymous with rail applications.

Understandably, there are many rail-related standards that must be adhered to in order for components and parts to be acceptable for use in applications in the sector. Parker products have

24

been developed to provide optimum performance whilst adhering standards covering, amongst other conditions: shock and vibration, low and high temperatures and humidity.

The company's wealth of engineering knowledge and experience in the transportation sector supports effective close collaboration with customers in the rail sector to develop and implement low maintenance, innovative system and modular solutions that address key requirements such as small size and low weight without compromising strength, durability, reliability and safety. Recognising the potential cost and disruption caused by rolling stock and locomotive downtime, Parker not only designs for long life, but also, wherever possible its products and systems are developed to be 'plug-and-play' so that when maintenance is needed, it can be completed quickly and easily with the minimum amount of risk and reduced specialist engineering knowledge required.

#### **Diversity to address** multiple applications

Parker's pneumatic motion and control solutions include cylinders and valves specifically developed for rail use with low leak rates and suitability for extreme operating temperature conditions of -40C to +150C seen in some applications in the sector.

Increasing electrification of rolling stock means more use of electromechanical systems and components in place of pneumatics. Parker's Electromechanical solutions give an unrivalled choice of speed, power, travel and force

combinations to deliver the flexibility to adapt to the needs of specific end applications. The company's diverse engineering skillset allows it to offer complete packaged linear positioning systems coupled to servo and stepper drives and controls to allow customers to yield the considerable benefits of a total integrated solution from a single supplier.

Drive and motor technology is advancing at pace with variable speed, software driven products with high degrees of connectivity helping customers in multiple sectors, including rail, benefit from much more sophisticated, flexible and efficient solutions. Parker is at the heart of this revolution with its continually evolving suite of traction motors, inverters, battery management systems and electrohydraulic pumps.

The company's AC and DC variable speed drive products combined with application specific function block-based configuration software ensures precise speed control and dependable performance in a multitude of rail applications.

#### Moving with the industry trends

With a growing global population, crowded roads and environmental concerns, rail transport for both people and goods has received renewed focus. That focus feeds a desire to evolve all aspects of the technology to optimise efficiency, viability and safety.

Aside from developing and releasing smaller, lighter and more robust components and systems and supporting increasing levels of aerospace markets. Learn more at electrification, Parker is wellplaced to address trends such as

the requirement to consider energy management for peak demand periods and also emerging potential for links to alternative energy sources including renewables with the company's EGT Energy Grid Tie (EGT) division looking into potential solutions in this area.

#### rtners, not just pliers

Close collaboration with supplier partners and complete project management of system design from initial concept through to delivery of plug-and-play, fully tested solutions tailored to specific customer requirements is an industry expectation. This approach can shorten development cycles and enable reductions in total acquisition costs for the customer. The strategy works best with suppliers such as Parker, who have significant engineering resource and know-how as well as broad product portfolios that can be combined in optimised, system solutions that are more reliable and have greater longevity than those based on an approach that uses multiple individual components from numerous suppliers that are then combined by the customer.

#### **About Parker** Hannifin

Parker Hannifin is a Fortune 250 global leader in motion and control technologies. For 100 years, the company has engineered the success of its customers in a wide range of diversified industrial and www.parker.com or @parkerhannifin.

## **BT Cables**

A world leader in cable manufacturing



Our enhanced product range now has more applications for the rail market.

Whether it is safety critical infrastructure cables like AzLM axle counter cables or fixed telephone network telecoms cables to in-station cabling for ticketing machines, digital notice boards or CCTV cameras, BT Cables has a product to suit your needs

and remember

at BT Cables we passionately believe in these key messages

- Your business success depends on the cables you use
  - Experience counts in cable sourcing
  - You need a cable partner you can rely on

Combined with the strength of BT Supply Chain we offer un-paralleled service and product solutions.

BT Cables – trust in our experience BT Supply Chain – Rethink what your supply chain can deliver

#### A subsidiary of

Delaunays Road, Blackley, Manchester, M9 8FP Tel: +44 (0) 161 741 2345 Fax: +44 (0) 161 795 8393 Email: info.btcables@bt.com

#### www.btcables.com

## **Predictive Maintenance**

Predictive maintenance is vital in detecting problems before an asset fails, thereby causing asset downtime, which is costly and will need to be dealt with at sub-optimal times.



In addition, detecting problems in advance improves the safety of railway operations. We caught up with Lucas Young, Business Development Manager for Northern Europe, with responsibility for transport sectors, at Axis Communications. He comes from a risk management and security consultancy background and has worked extensively in the transport sector including ports, maritime, rail and airport environments. He gave us his views on the state of predictive maintenance in the rail sector.

**Railway-News:** We wanted to have a chat about predictive maintenance and the fact that it remains an underutilised resource. What are your thoughts on this?

**Lucas Young:** Large public transport authorities are in a difficult situation. They have the most to gain from effective predictive maintenance strategies and yet face significant challenges in its adoption. These can take the form of financial restraints or a culture of suspicion around drives to increase efficiency. Despite this, we are increasingly seeing dedicated innovation teams improve the UK's rail industry – exploring future-facing practices such as predictive maintenance.

**RN:** When we spoke

earlier, you mentioned that cameras in particular could help with predictive maintenance. Do you have some examples?

**LY:** IP surveillance cameras are increasingly being used in non-security 'on-board' applications. These uses range from filming the pantograph connection with the power line and monitoring the connection to record any incidents, to forward-facing cameras in the cab. There are a multitude of applications for high-quality video here, including track surveillance, workforce monitoring, vegetation and bridge surveying, and even driver

training. One of our partners currently uses a form of 'augmented reality' – video footage overlaid with CAD drawings to aid in station design and other architectural design applications.

**RN:** The rail industry is notoriously slow to change. You work in the UK and in Scandinavia. Are there any major differences between the rail industries of these two places?

**LY:** The rail industry across the world has historically been slow to adopt new technology perhaps in the UK we have been somewhat slower than the Nordics, and much of this can be attributed to the differences in infrastructure. The UK rail network, the first in the world, is relatively large with over 16,000 miles of track, numerous train operating companies (TOCs) and separate rail operators providing services throughout the mainland. It is a particularly complex operation. The only comparable Scandinavian national network is in Sweden, with about 13,000km (8.078 miles) of track.

The Nordics have been particularly innovative and quick at adopting certain technologies; most notably when we look at the adoption rates of IP video. In the UK rail industry, likely due to efficiency drives from 'the top', we have witnessed a real sense of determination to find newer, better ways of doing things. Innovation teams are now a common stakeholder we interact with in public transport authorities and private TOCs.

Network Rail, the infrastructure owner in the UK, is separate from the TOCs operating their franchises. It's hard to say if this structure is a problem for technology adoption - but if it is, it would also be a problem for Scandinavian network operators which, excluding those in Finland, are privatised. The extended franchise agreements now being offered to UK TOCs will likely facilitate a shift away from shortterm budgetary decisions. Instead, this encourages a longerterm approach; allowing total cost of ownership to enter procurement considerations, enabling a more efficient use of funds.

#### **RN:** Maintenance at its most basic is reactive. Predictive is the next step. How do you see the move beyond this to prescriptive maintenance?

**LY:** The move to prescriptive maintenance is coming – it's almost certainly already here to some extent. There are currently three main challenges around the large-scale adoption of prescriptive maintenance faced by both public transport and technology specialists. Firstly, the understandable concerns of individual workers and unions alike must be addressed around the impact that automation has had on jobs in the past. Secondly, we must prove the capabilities of *IP camera technology in rail and* provide assurance of its suitability in a safety-critical application.

This leads us to the third challenge – the issue of liability should something be missed. Ultimately, to realise the true benefit that such a system provides, we must move beyond half measures. We cannot simply rely on people checking what the technology is telling us – it must be used as a truly 'smart' solution, generating alerts independently.

**RN:** Axis are hosting a Network Rail Approval Meeting on 30th August. Can you tell us a bit more about this event?

LY: Axis and Network Rail are providing our partners with the opportunity to better understand how and when the 'Network Rail Product Approval' process applies to network video technology. We will also be providing lunch and a brief presentation on suicide prevention in rail and some of the technology which is being used to support the efforts of Network Rail in this area. The content is CPD certified, so will also count towards the official professional development of those attending.

If you wish to attend this meeting, you can register at http://www.axis-

#### communications.com/Network \_Rail\_Approval\_Meeting

For more information about Axis, please visit **www.axis.com**.







1 INCH THICK ELECTRONICALLY STEERED ANTENNA





LEARN MORE AT phasorsolutions.com



## **Phasor: Empowering** the Digital Railway

#### All across the world, rail networks connect people and goods with places.

Many are undergoing expansion as rail companies and governments try to encourage more people to use efficient train services. In addition, passenger expectations for en route connectivity are rising. Access to ubiguitous broadband on the move has become a critical part of too. Through broadband the travel experience. Broadband access on trains is now a major consideration for rail companies and broadband services providers the world over and there is a great deal of investment being made in rail connectivity as operators try to meet the demands of 21st century passengers.

For commuters who want to check on their emails or access a presentation in advance of arriving at the office, to travellers that wish

to use their mobile devices to keep in touch on social media or watch their favourite TV show, a reliable broadband connection is a basic requirement. But it's not just the passengers whose journey can be enhanced by mobile broadband, it's the rail operators connectivity, they can run a safer, much more efficient service by employing connected telematics and logistics techniques to monitor the equipment on board and provide real-time updates and crew communications services along the route.

Currently, many train services rely upon wifi hotspots or cellular coverage, which is often patchy, unreliable and expensive (as many

passengers have to pay for access). This can mean that the whole 'connected' experience is unsatisfactory and not reliable. The train route will inevitably move out of the terrestrial wireless coverage areas, resulting in loss of connection and a generally unhappy customer experience.

Satellite-based broadband has the power to transform the connectivity on board trains. Broadband satellite connectivity, coupled with terrestrial networks, can provide a better, total solution for rail operators and passengers alike. As long as there is a clear line of sight with the satellite, it can transmit and receive. However, today the ACCESS **TECHNOLOGY** is based on unreliable, mechanically steered, parabolic dish antennas. These are heavy, complex and prone to failure due to their many moving parts. They are difficult to repair, costly to install and they track signals relatively slowly, dropping network connections as they take time to re-acquire signals. Satellite provides an ideal solution, but the





access technology available today is unreliable, bulky, not low-profile and maintenance intensive.

Phasor has developed the solution to this problem. The company is getting ready to unveil the world's first enterprise-grade, solid-state, electronically steerable antenna, (ESA) designed for the rail market. Lightweight, very low-profile, conformal and highly scalable to meet a broad range of bandwidth requirements, the Phasor electronically-steerable antenna will usher in a new era of broadband connectivity, reliability and convenience.

The Phasor team have taken the traditional parabolic-dish antenna and shrunk it on to its own proprietary microchip. By miniaturising the antenna components and functions, Phasor's electronically steerable antenna is just two inches thick, with no moving parts. This revolutionary design means that the antenna is very low-profile, highly reliable and can be scaledup without loss of performance; it can be integrated into the train roof as a flat or conformable unit.

Using a software-defined antenna architecture, the Phasor ESA can achieve nearly instantaneous tracking speeds and can track two independent satellites, simultaneously – essential in this new era of NGSO (Non-Geosynchronous Satellite Orbit) constellations.

Phasor technology can empower rail operators and their communications services providers by enabling them to take advantage of an ever increasing range of applications that facilitate overall operational efficiency. These include: operational telematics, such as monitoring of equipment and systems, overall train performance, track conditions and general status, crew communications, scheduling, logistics updates and security.

Passengers on board trains wish to enjoy access to social media, to email, online services and entertainment. Phasor's unique access technology can deliver the necessary broadband connectivity to allow the delivery of these services.

The benefits of Phasor's breakthrough ESA system to the rail market are simply unrivalled. For mission-critical, operational datalink applications and high bandwidth passenger connectivity, the launch of Phasor's antenna will be significant to the rail services market. This versatile antenna system is poised to meet the increasing demands for high speed and reliable services both today and well into the future.

Enabling the digital railway has never been easier.

Find out more about Phasor's unique technology and watch informational videos at **www.phasorsolutions.com**.





## WINDHOFF MPV for Northern Ireland Railways (NIR)

In 2015 WINDHOFF Bahn- und Anlagentechnik GmbH has awarded a contract for the construction and delivery of one rail-bound sandite and water-jetting vehicle by Translink in Ireland.



Due to compacted leaves on the railheads in the leaf fall season, leading to a negative impact on wheel-rail adhesion, train delays are inevitable. In order to improve the current situation, NIR have ordered a new WINDHOFF multipurpose sandite and water-jetting vehicle - WINDHOFF MPV - to replace the existing aged vehicles, which are not as cost-effective. Based on the modular concept approach, a combination of highpressure water-jetting and sandite application will be installed on the bi-directional, self-propelled WINDHOFF MPV vehicle.

Powered through a diesel engine as part of a MTU power pack the maximum speed is 100km/h. In working mode the maximum speed is 50km/h. Both drivers' cabins are air-conditioned and offer ample space for the driver and for the operator of the work modules. Additional infrastructure workers can be transported if necessary. All working modules are located on the vehicle deck between the cabins.

Current standard safety systems such as AWS/TPWS, TCA and OTMR are installed.

Two different working configurations are planned. The water-jetting configuration includes a water-jetting module, a sandite module and a water tank. Water-jetting will be run at 1,500 bar. The weed-spraying configuration includes one weedspraying module along with another water tank module. All sub-systems used in the configurations are connected to the central control system featuring an ergonomic functional layout via a coloured touchscreen. Both the cabin design together with the ergonomic arrangement of the components the

MPV provides a non-fatigue work environment for drivers and operators. Right now the machine is in its commissioning and training phase in Northern Ireland awaiting the upcoming fall season. WINDHOFF Bahn- und Anlagentechnik GmbH, Rheine, Germany is a worldwide supplier of a broad range of high-tech products with focus on rail vehicles and railway as well as shunting technology.

During this year's RAILLIVE, Long Marston, UK on 21/22 June interested visitors were able to learn more about the opportunities with WINDHOFF solutions at their open air site stand no. J1B.



#### WINDHOFF

99709428011-9

#### Visit us at INTERGEO 2017

#### Position independent rail solution

Visit **www.leica-geosystems.com** Mobile Sensor Platforms for more information or to request a demo.

#### Leica SiTrack:One Continuous rail capture

Leica SiTrack:One enables fast and continuous rail infrastructure reality capture, providing highly accurate 3D data, from rail gauge to 360 clearances. With no stop-and-starts and calibration done on site, personnel are off the tracks quicker. Tightly coupled inertial components automatically position without GNSS.



Leica Geosystems AG leica-geosystems.com



©2017 Hexagon AB and/or its subsidiaries and affiliates. Leica Geosystems is part of Hexagon. All rights reserved.





## Upcoming Railway Events

## July, August, September 2017

#### 14 Aug 2017 – 15 Aug 2017 5th Annual Malaysia Rail 2017

#### Aloft Kl Sentral – Kuala Lumpur, Malaysia

The 5th Annual Malaysia Rail 2017 conference is a 2day strategic event that is being hosted on 14–15 August 2017 at the Aloft KI Sentral in Kuala Lumpur, Malaysia. Rail The transportation sector of the Asia-Pacific region is gradually advancing towards the technological world. There is an increase in the connectivity between various southeast Asian countries through various railway networking systems. The rail sector of the southeast Asian region is ready to take its next step and become digitalised. Let's converge at this prestigious event and discuss the development happening in the southeast Asian region regarding the railway sector.

More info:

http://www.infraoutlook.com/events/mr2017/

#### 30 Aug 2017 – 31 Aug 2017 5th Railway Forum Berlin 2017

#### Estrel Congress & Messe Center

The participants of the RAILWAY FORUM Berlin will discuss the measures that need to be taken to maintain the railway industry's competitiveness, and the role of the various actors in the value system to achieve it. The conference is organised in coordination with Deutsche Bahn AG according to the four strategic objectives of the railway industry. **More info:** 

#### https://www.railwayforumberlin.com

#### 12 Sep 2017 - 13 Sep 2017 HSR Asia 2017

#### Kuala Lumpur, Malaysia

HSR Asia 2017 is the definitive high-speed rail event for the industry's leading players who are currently tackling the strategic, technical and operational challenges of designing and implementing high-speed rail networks. This essential forum is targeted at those interested not only in the latest developments in the high-speed rail arena but also in the policies and regulations that both push and hinder the continued creation and operation of world-class high-speed rail systems.

More info: http://www.stratcoms.com/HSRAsia2017/

#### 17 Sep 2017 – 20 Sep 2017 Railway Interchange 2017

#### Indiana Convention Center

Railway Interchange is the largest combined railway exhibition and technical conference in North America. Attended by nearly 10,000 industry professionals from around the globe, this truly massive event showcases the latest technology, services, and research by members of the Railway Supply Institute (RSI), the Railway Engineering-Maintenance Suppliers Association (REMSA), and Railway Systems Suppliers, Inc. (RSSI).

More info: http://railwayinterchange.org/



#### 19 Sep 2017 – 21 Sep 2017

#### Fire Protection and Safety in Tunnels 2017

#### Bergen, Norway, (Venue TBC)

Fire Protection and Safety in Tunnels is the leading event bringing together tunnel owners and operators, researchers, solution providers and fire safety experts to gather and share best practices, risk minimisation strategies and technological advances which protect tunnel infrastructure and passenger safety across the continent.

More info: http://www.arenainternational.com/fpst

#### 25 Sep 2017 – 01 Oct 2017 Rail Safety Week 2017

#### UK, TBC.

Rail Safety Week is an industry-led initiative focusing on rail safety for all. Whether your career lies within the rail industry, or whether you use the railways to get from A to B – rail safety affects us all. Rail Safety Week aims to address, engage, promote and bring rail safety to the forefront of people's minds across a dedicated week. Working in partnership with leading names in the rail industry, health and safety conferences, site briefs and school safety-based events will be held across the UK in order to promote the vital importance of rail safety to each and every one of us.

More info: http://railsafetyweek.info/





# RAIL SAFETY WEEK 2017

25th September - 1st October

# All aboard to destination safety!

#buildingsafetytogether



## ArmaFORM® PET Foam Core Perfectly Fulfils Rail Industry Needs

Today's train operators and manufacturers are challenged by the need for even lighter, more energy-efficient and environmentally friendly trains without compromising on safety and durability.

Composite sandwich constructions are increasingly used in the railway industry owing to their combination of lightweight, high mechanical strength and maximum service life.

In 2006, Armacell launched a completely new foam core material in the composite industry, a PETbased (polyethylene terephthalate) foam core, called ArmaFORM<sup>®</sup> PET. After its successful introduction into wind turbine composite applications, ArmaFORM<sup>®</sup> PET is used today in more than 50,000 rotor blades worldwide; the PET foam core is also steadily finding a growing market in the railway industry. With ArmaFORM<sup>®</sup> PET we offer a structural foam core combining high strength with low weight, excellent fatigue and durability, superior temperature stability and excellent compatibility with all common resins and manufacturing methods.

Beyond the mechanical properties of sandwich structures used in railway applications, the fire, smoke and toxicity (FST) performance is a top priority in public transport, even more when trains operate under ground or in tunnels. With the introduction of the new European standard EN 45545-2, the requirements for FST performance in core material have become even more demanding.

#### ArmaFORM® PET - the greenest among PET foam cores



#### ArmaFORM<sup>®</sup> PET – a core foam tailored to EN 45545-2 requirements

One of the big advantages of ArmaFORM<sup>®</sup> PET core is the very low smoke and toxicity level achieved when subjected to fire. Armacell offers two grades: the non-self-extinguishing standard grade PET GR and the fire-retarded, self-extinguishable PET GFR grade. Experience in the industry has shown that fire-retarded core material grades are not necessarily needed for trains classified under EN 45545-2. The core material contributes mostly to the smoke and toxicity levels, slightly to heat release, but almost zero to flame spread, while the skins handle the flame response. Official testing has shown that ArmaFORM® PET cored sandwich structures, in combination with appropriate laminates, achieve the highest classification, HL3 which qualifies the material for use in all types of trains including metro, sleeper and couchette cars. That would be impossible to duplicate with traditional core materials such as PVC core.

#### Armacell is offering a 'multicore' sandwich solution

A further key requirement of exterior and interior rail sandwich application is its impact resistance. Important factors towards optimising the impact performance and resilience of the sandwich structure are the core materials' compression strength, ductility and adhesion to the skins. With ArmaFORM<sup>®</sup> PET core all these requirements are perfectly met; comparative testing shows that a PET-cored sandwich structure can outperform traditional concepts like honeycomb as well as balsa-cored structures.

The basic properties resulting in a thermoplastic PET foam core enable novel ways of processing the core. It is known that by using a layered core material with different densities, properties can be improved when it comes to e.g. impact and point load resistance. However, the extra cost and weight of bonding the core sheets together with an adhesive often offset the advantages gained. With the thermoplastic welding process already in use for PET core, you can economically and safely make "bonding" without the grooves/perforations and adhesive normally required, while achieving a uniformly well controlled bond line every time. Recycling is also still easy as no other material is mixed into the PET core. This opens up several possible applications for layered multi-density core materials both in transport such as trains and trucks as well as in building and construction.



#### The 'greenest' among foam cores for rail sandwich application

Further high priority for the rail industry is attributed to the environmental aspects of the trains. Today, designing and manufacturing eco-friendly trains also implies consideration of how the processed materials are manufactured. Armacell is the only manufacturer worldwide making PET foam cores from 100% post-consumer (recycled) PET materials, with the same consistent, reliable qualities as standard PET cores in the market and, at the same time, with significantly improved environmental performance. ArmaFORM<sup>®</sup> PET outperforms any other foam core material in terms of environmental benefits, and its use enables Armacell and its customers to present a real 'green' and costeffective alternative to other PET and traditional foam cores currently used in railway applications.

#### ArmaFORM<sup>®</sup> PET GFR: the first fireretarded PET foam made from 100% recycled PET

Armacell's patented technology to produce PET foam from 100% post-consumer (recycled) PET materials also started to be applied to the fireretarded, self-extinguishable grade, called PET GFR. It is superseding the previous PET FR family made from virgin PET resin. ArmaFORM® PET GFR is now commercially available in a density of 70 kg/m<sup>3</sup> with classification M1/F1 according to AFNOR NF F 16-101. The ideal combination of superior FST properties, mechanical properties, costeffectiveness and environmental sensitivity makes ArmaFORM® PET GFR grade the material of choice for railway sandwich applications such as component floor panels, nose cones, interior ceiling and partition walls, doors and much more.

### We hope you have enjoyed our latest Railway-News magazine. Be sure to look out for our next issue.

We are now producing a magazine on a quarterly basis so please do not hesitate to contact us at al@railway-news.com if you would like to feature your latest technology in an upcoming issue. Please also take a look at www.railway-news.com for all the latest rail news, events and technology.

1111

**Mob:** +44 (0) 7432 725001

email: al@railway-news.com

A2B Global Media

Office Tel: +44 (0) 1392 580002

Third Floor

11-15 Dix's Field

d | Exeter | EX11QA

------

ALSTOM

654 601

QA | United Kingdom

#### www.railway-news.com