

The background of the cover is a solid blue color. In the upper right corner, there is a white and orange graphic element consisting of several parallel lines that create a sense of depth and perspective, resembling a stylized 'N' or a set of tracks. In the center of the cover, there are two dark blue silhouettes of people wearing hard hats, facing each other as if in conversation. The silhouettes are positioned in the middle ground, with the text in the foreground.

**Safety, Technical
and Engineering (STE)
An Introduction**

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Welcome...

I am delighted to introduce you to the Safety, Technical and Engineering (STE) team.

The primary focus of STE is to enable safety and performance across Network Rail.

As a centre of excellence, we use business intelligence to set strategic direction, capture and share best practice, and provide tools, guidance and resources that enable the Routes, Regions, and Corporate Functions to achieve their Control Period targets. Above all, we are relentless in our efforts to achieve our Safety Vision of Everyone Home Safe Every Day.

This booklet provides an overview of STE and its component parts, and brings to life the work we do through a variety of case studies.

Working collaboratively is vital to our success, and our guiding principles (page 8) set out how we work with each other and our customers. They are fundamental to our reputation and service.

I look forward to working with you as we make our railway Better Every Day.

Kind regards,
Graham



Who Are STE?

The STE function brings together work streams including asset management, operations, engineering, rail technical strategy, safety, health and quality, and sustainable development to ensure collaboration and the achievement of mutual goals.

The function is accountable for national change programmes including Business Critical Rules, level crossing risk reduction, risk based maintenance and safety culture change.

STE is led by Graham Hopkins, STE group director. A chartered engineer, and Fellow of the Royal Academy of Engineering, Graham joined Network Rail in June 2015 from Rolls-Royce where he was executive vice president of Engineering & Technology Aerospace Component Engineering.



Our Accountabilities:

STE has 13 top level accountabilities which are recognised within four key themes:



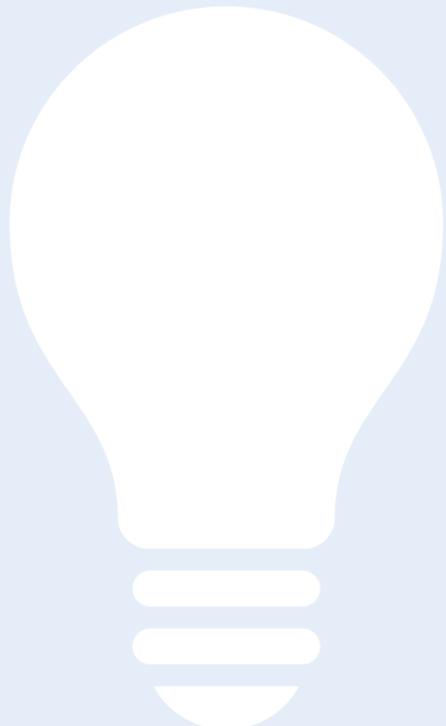
Innovation

- Lead the development of a creative and innovative environment for STE
- Lead the management and delivery of the organisation's research, development, technology and innovation pipeline



Leadership

- Set overall direction and corporate strategies for safety, health, environment, sustainability, asset management, engineering, technology, maintenance and operations
- Define applications, systems, frameworks, policies and outputs (including competencies) for safety, health, environment, sustainability, asset management, engineering, technology, maintenance and operations
- Set the overall direction and govern delivery of national improvement programmes for safety, health, environment, asset management, maintenance and operations
- Primary point of contact with safety, economic (from an asset and technical perspective), and environmental regulatory bodies
- Develop and maintain the framework and be the custodian of Business Critical Rules (BCR)



Assurance

- Provide and maintain competency frameworks and assure the professional, technical and leadership strength of our workforce across safety, health, environment, asset management, engineering, maintenance and operations including key appointments across Network Rail
- Provide assurance for the completeness of and compliance with systems and controls for safety, health, environment, asset management, maintenance and operations
- Lead on functional safety, health, environment, asset management, maintenance and operations audits and investigations



Continuous improvement

- Lead reporting, analysis, forecasting and performance benchmarking across safety, health, environment, asset management, engineering, maintenance and operations to uphold quality, continuous improvement and sharing of best practice through lateral learning events
- Plan the organisation's future safety, health, environment, technical, engineering, maintenance and operations talent and competency requirements, taking into account technological developments
- Manage the health and vitality of the organisation's safety, health, environment, technical, engineering, maintenance and operations talent and competency pipeline



Our Guiding Principles:

The STE guiding principles give the team direction, and represent the actions we should be role-modelling on a day-to-day basis.

Customer delight drives our action

- I put myself in my customers' shoes
- I exceed my customers' expectations
- I make things simple
- I improve and innovate
- I deliver better value than our competitors

Respect and integrity guide our behaviour

- I act ethically and obey the law
- I respect and value others in their individuality
- I act honestly and openly
- I earn the trust of my colleagues and customers
- I do not tolerate unethical and irresponsible behaviours

Team together – Team apart

- I share my opinion openly and make my views known
- I seek out the opinion of others
- I address issues not individuals
- I fully stand behind the team decision
- I put my full energy into executing the decision

Best place to perform and grow

- We attract and retain the best and most competent people
- We create an environment for our people to grow
- I am dedicated to achieving the best results
- I take responsibility for my own development
- We recognise and reward high performance

I am Network Rail Count on me

- I am a proud ambassador of Network Rail
- I deliver what I promise
- I take ownership for what I do
- I serve my colleagues as I serve my customers
- I act in the best interests of Network Rail worldwide



Useful Network Rail Tools and Resources:



Lifesaving Rules

Our ten [Lifesaving Rules](#); refreshed in July 2014, are the result of our ongoing commitment to eliminate all injuries and fatalities in Network Rail. We all have a responsibility to comply with the Lifesaving Rules and to personally intervene if we feel others may be working unsafely.

Our Lifesaving Rules underpin our safety values and vision, they are for everyone; whether you are office based or work on the frontline.

Revising the Rules puts our learning into action and ensures they are fit for today's railway – as Network Rail evolves, our Rules must evolve too.



Close Calls

The [Close Calls](#) system has been in operation since January 2013 and allows our colleagues and contractors to report risks – from unsafe behaviours and trips hazards to infrastructure faults. The system allows these reports to be assigned to a responsible manager to be reviewed and resolved.

By reporting these issues and incidents and capturing data we can identify risk trends, or patterns of unsafe behaviour. Identifying these potential incidents in advance allows us to mitigate future risks through training, updated procedures or intervention.

No matter where you work, reporting Close Calls is vital to improving our safety. Even if you are able to resolve a call at the time, it is still important to report into the Close Call system. The more data we receive about Close Calls the smarter we can be in preventing accidents nationally.



Fair Culture Principles

Fair culture is the foundation of a positive safety culture. It's important to remind ourselves of what fair culture means in our organisation and our responsibility to consistently uphold and apply fair culture principles and processes to the decisions we make.

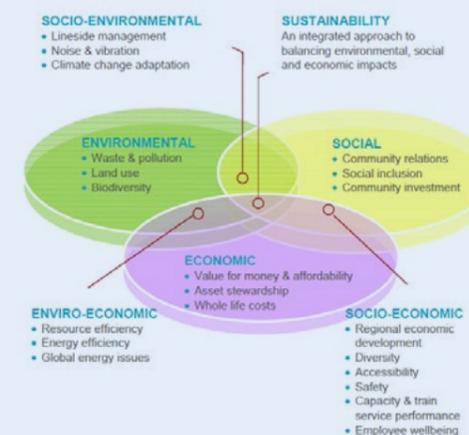
Network Rail's [Principles of Fair Culture](#) were introduced in 2012 and signed by Network Rail and the Trade Unions to provide a clear framework for investigating incidents. The focus is to investigate incidents fairly, identifying what went wrong and to learn from them in a blame-free environment, with a consistent investigation process, so it doesn't happen again. The principles were re-signed in 2014 to show a continued commitment.



Environment Policy

The [Environment Policy](#) was launched in September 2015, the policy sets out the approach to environmental management which is key to achieving our company vision. It outlines expectations for our colleagues in the form of key principles that must be adhered to.

The vision is to improve our environmental performance and leave a sustainable legacy for future generations. Outstanding environmental performance is a central part of being a responsible and successful company and will help us to protect and enhance the UK's environment.



Safety Hour Discussion Packs

Safety Hour is an initiative that is currently adopted in Network Operations – it is where teams take one hour a week out of their working time to hold a safety discussion on any areas of concern, local issues or using centrally produced discussion packs.

The hope is that Safety Hour will be adopted wider within the business, and [Discussion Packs](#) are available as part of a wider [Resource Library](#) on Safety Central to be used as required to host safety discussions.



Safety Bulletins

[Safety Bulletins](#) are sent in the form of an alert, bulletin, advice or shared learning and are often sent in response to an incident that has occurred, or an equipment fault that has been noted, to ensure stakeholders are aware of any potential risks.

A catalogue of all safety bulletins is kept on Safety Central and can be accessed as required.

STE Functions:

In 2014 Network Rail moved to a matrix model to improve collaboration and make clear the accountabilities within the organisation.

The seven functions that make up STE were brought together as part of this design, first and foremost, to create a technical authority and centre of expertise; accountable for setting policy and direction for the rest of the business.

Each team within STE has a clear focus covering health, safety and quality, risk analysis, environment, engineering and much more that, when brought together, enables the operational businesses to succeed.

The seven teams that make up the Safety, Technical and Engineering Directorate are;

1. Health, Safety and Quality
2. Engineering
3. Chief Rail Technology Officer
4. Environment and Sustainable Development
5. Risk, Analysis and Assurance
6. Business Management
7. Finance



1. Health, Safety and Quality





The Health, Safety and Quality (HSQ) team leads on our strategies to embed Network Rail’s safety vision of ‘Everyone Home Safe Every Day’.

The HSQ team’s remit covers health and wellbeing; public and passenger safety, workforce safety, ergonomics, and developing our Integrated Management System, including through quality management and our Business Critical Rules.

The team leads the Home Safe Plan: the 21 prioritised projects that should bring the biggest health and safety benefit for our workforce, passengers and people who live or work near, or have to cross, the railway.

The 21 projects that the team are currently focussing on are;

Fatigue Risk Management 1	Risk Management (WARAs) 2	Management of Occupational Road Risk (MORR) 3	Sentinel 4
Electrical Safety Delivery (ESD) 5	Safer Trackside Working (STW) 6	Planning & Delivery Safer Working (PDSW) 7	Procuring for Safety 8
Safety Hour 9	Community Safety Strategy 10	Level Crossing Risk Reduction (£99m) 11	Reducing Platform Train Interface Risk 12
Prioritised Technologies for Level Crossing Safety 13	Train Accident Risk Reduction 14	Health & Wellbeing Respiratory 15	Health & Wellbeing Medical Standards 16
Health & Wellbeing Resilience 17	Health & Wellbeing First Aid 18	Manual Handling Improvement Programme 19	Business Critical Rules 20
Integrated Management System 21	Projects and programmes can be added to this list following a comprehensive risk ranking exercise. Integrating ergonomics and behavioural change, the team also looks at the efficiency in our working environment and the impact our decisions and actions can have on safety and performance to allow us to learn from this and strive for improvement.		

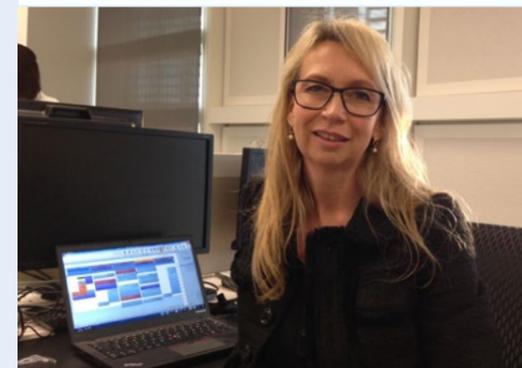


Photo: Lisbeth Frømling, Chief Health, Safety and Quality Officer.

Contact

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and
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The Operations Principles and Standards team provides the technical authority on operations to the Routes and other functional teams within Network Rail. The team leads on operational policy, strategy and the delivery of an operational competence framework.

The team provide technical expertise in many areas and give a focal point for operational matters. The remit for the Operations Principles and Standards team covers international & national operational strategies to help manage the operational risks on the network. These areas include operational rules, the transport of dangerous goods and liaison with Railway Undertakings.

The team have regular liaison with the Route teams to discuss and communicate these strategies. This is supported by the Operational Alerts which target specific technical issue to front end staff and the periodic System Operations Risk Report.

Some of the team's key work streams include operational competence, policy and standards, Operational Security and Continuity Planning strategy, Trade Union liaison and operational leadership.

For further information please contact askoperations@networkrail.co.uk



STE in Action... Case Study Mental Health in the Workplace



As part of our 10 year health and wellbeing strategy mental health is a key focus. By 2024, we aim to achieve the following in relation to employee mental wellbeing:

90 % of people will report not being troubled by their work environment (during 2014/15 77.6 % of employees felt they were not excessively troubled by workplace pressures).

The proportion of our people reporting a high level of positive mental wellbeing will be 10 % better than that of the general working population (In 2014/15 59 % reported positive wellbeing in the general working population).

How are we going to achieve our goals?

- Manage a healthy workplace – improve the way we support those involved in traumatic events at work and assess the impact of primary work-related factors that impact on mental wellbeing.
- Promote wellbeing – we have signed up to the Time to Change campaign to reduce stigma and discrimination related to mental health to publicly show our dedication to employee health and wellbeing and to guide our interventions. We also have an online health and wellbeing presence providing guidance, tools and support.

- Investment - we will invest in resources and offerings to allow our people to better understand their personal health status and ways in which they can optimise their health and wellbeing. The online wellbeing assessment is one of the tools that enables this with specific reference to mental wellbeing.
- Develop a supportive culture - improve awareness and engagement, partnering with relevant organisations and charities such as Time to change to address sensitive health issues and reduce the social stigmas often associated with them.
- Update standards - review and, where necessary, update our broader health and absence-related policies so that they are most effective, fair and reflect our best understanding of successful and contemporary health and wellbeing management.

STE in Action... Case Study Integrated Management System (IMS)



Within Network Rail we currently develop and maintain in excess of 20 different management systems. At the moment we do not have the systems to ensure these are aligned, which creates risks to business and safety performance. A stakeholder review in 2015 identified a need to integrate these systems to create one system to ensure efficient operations and easier management to help us achieve our business objectives.

STE will own the IMS system, which will include policies, processes, technical standards and compliance references.

Based on the devolved nature of our business, and the need to make the system suitable for all, the top part of the framework will be designed to fulfil overall business objectives, while lower levels will be flexible to the Routes to assist them in delivering their own requirements.

The IMS will address the risks identified within the current systems, and support a shared understanding of roles and processes (addressing a current barrier to effective collaboration) and a move towards a compliance culture at all levels in the organisation.

The IMS will be delivered in 3 phases over a period of 4 years:

- Phase 1: Combining the 20+ systems into one system removing duplications and non-value added parts. Carry out GAP analysis against relevant standards including ISO 9001, ISO 14001, OHSAS 18001 and ISO 55000 as well as relevant legislation. Gaps will be closed before moving to Phase 2.
- Phase 2: Transfer all content as-is into a modern process tool providing a user friendly platform for continuous improvement
- Phase 3: Develop Network Rail LEAN methodology for effective process improvement and drive optimisation of selected processes before moving methodology into business as usual (BAU)

STE in Action... Case Study

Safer Trackside Working

As the need to complete work on or near the track (open lines) remains, our track workers are continuing to get struck by trains. Higher volumes of traffic and longer operating hours, along with fewer signallers will increase the need for safer trackside working as the risks grow. As a result, both protection and warning systems are required for the future - these must be of a higher integrity and remove the opportunity for human error, and this is where the Safer Trackside Working project comes in.

This programme has two key phases:

1. Development of tactical solutions tested and approved by the end of 2016
2. Development of longer-term strategic 'line of route' solutions to be designed, tested and approved by the end of CP5

What are the Safer Trackside Working project goals?

- Contribute to the elimination of fatalities and major injuries in accordance with Network Rails Transforming Safety and Wellbeing Strategy
- Modernise safety protection and warning systems used by frontline staff
- Reduce the opportunity for human error
- Provide improved safe access systems in the face of increasing volumes of traffic and operating hours
- Develop and promote trust and belief in new technologies by frontline staff with Trade Union support via the Trust Passport Process

As part of the Safer Trackside Working Programme we will design, test and approve new warning and protection systems for the U.K network that will reduce the risk of our workforce being injured when working on or near open lines. These will be available for Routes to deploy to promote safer working during maintenance, renewal and enhancement works. A national deployment strategy will be prepared to optimise safety benefits.



STE in Action... Case Study

Operational Procedures

The Operations Principles & Standards team are the owners and technical experts of several working manuals for front line operations staff. This includes the Managed Stations Manual, the National Control Instructions, the Operations Manual and the Electrical Control Instructions. These manuals detail the day to day procedures for the management of operational risk on the network. We are working to combine these four manuals into a single set of modular operating practices called the National Operating Procedures. This work is being completed in conjunction with the Route teams with many pieces of work being led by an operations expert in the Routes.

The team are the custodians of the National Operating Instructions which are our single duty holder instructions for signallers. The National Operating Instructions contain the elements of the Rule Book which were removed during the 'New Approach to the Rule Book' project which was run by the RSSB to make the Rule Book more user friendly. The team are continually reviewing the content of the National Operating Instructions in line with Rule Book updates with operational experts from the Routes.

The Operations Principles & Standards team own and manage the updates to all the company Operational Standards. Through the Operations Standards Steering Group the team provide a level of control to enable the review of standards or the introduction of standards to better manage operational risk. Examples of these standards include the national Emergency Plan, Management of Spoken Safety Communications and Weather - Managing the Operational Risks. These standards are regularly reviewed with close engagement with the Routes and other functions to make sure the content better manages the operational risks.

National Operating Instructions

NR/NOI-004 – December 2015



2. Engineering



Engineering brings together all of the company's engineering disciplines to provide engineering leadership, technical authority and manage the network's engineering capabilities to deliver a world-class railway.

The team set the engineering and technical vision, strategy, research and development requirements, policy, controls, frameworks and assurance across the technical disciplines.

We exist to use our engineering expertise to make today's railway better for tomorrow. We create the framework for the management and development of assets, technology and people; to provide engineering expertise and leadership to continually improve asset safety, performance and costs.

Engineering Vision

We will be a trusted engineering leader to the rail industry. We will know we are successful when:

Our Peers

- Recognise us as technical leaders in our industry
- Choose to work with us
- Consistently value the output of our activities

We Are

- Known to deliver
- High on the list of Top 100 employers of choice for engineering graduates
- Hosting or founding technical forums relevant to the rail industry
- Seen to be innovative
- Winning awards that demonstrate our technical knowhow
- Sought after to collaborate on industry-wide initiatives

Our Employees

- Are proud of the things that they deliver
- Act with mutual respect between our teams
- Celebrate our achievements as a team

Engineering Objectives

The core objectives of the Chief Engineer's organisation are to:

- Set the overall direction and corporate strategy for engineering and asset management in Network Rail;
- Create and assure the national framework (including optimised policies, standards, processes and tools) for the management and development of assets, technology and engineering capability;
- Provide engineering expertise and leadership as the Technical Authority;
- Provide leadership and governance of national improvement programmes for asset management and engineering;
- Lead the forecasting and benchmarking across asset management and engineering to uphold safety, performance, drive continuous improvement and the sharing of best practice and lessons learned.



Photo: Jon Shaw, Chief Engineer.

Contact

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STE in Action... Case Study

Buildings, Architecture and Civils



We are primarily accountable for the robustness of our asset policies across a range of disciplines.

From lineside buildings to stations, assets also include bridges, tunnels, and viaducts. Architecture is part of the built environment and a key part of this team.

The teams remit also includes landslide management, and prevention is a focus of the geotechnical group within our team, who set the management processes for embankment and cutting slopes. We also have specialists who deal with the legacy / active mining risks in the UK and the interaction of drainage across parent assets such as track and earthworks.

Finally completing the mixture of skills is the abnormal loads team who safely facilitate the interface of third party movements.

We are a diverse team of skilled engineers protecting the interest of our many assets and working to ensure a railway fit for the future.

STE in Action... Case Study

M&EE's New Approach To Improving Safety In Ageing Signalling Power Systems



Committed to engineering excellence, Mechanical & Electrical Engineering (M&EE) have an extensive remit, with responsibility for developing and maintaining engineering best practice for Network Rail across plant, traction and electrification systems. This also includes being custodians of the associated standards, specifications and design authority, as well as providing quality assurance for compliance and safety.

M&EE work with a wide range of stakeholders, who include Network Operations, in particular the Routes; Infrastructure Projects (IP) and the National Supply Chain (NSC). Externally, M&EE engage with the Train Operating Companies (TOCs) and Freight Operating Companies (FOCs), the Rail Accident and Investigation Branch (RAIB), the regulators; Office of Rail Road (ORR), and the Department for Transport (DfT), as well as a number of suppliers.

Working safely with an infrastructure that has been in place for decades presents challenges, and M&EE is committed to delivering safer yet innovative solutions that will improve the efficiency of the railway as well as decreasing risk both to the workforce and general public alike.

In particular, M&EE have been working closely with the Routes, IP and NSC, as well as collaborating with a number of suppliers to introduce a new approach to improving safety around signalling power systems. This new approach will improve electrical safety around the railway's extensive signalling power supply network, which could affect both the workforce and people on station platforms.

By retro-fitting compact Class II switchgear, lightweight aluminium transformers, better-designed power cables, leading-edge monitoring equipment and cable management accessories, this new approach will improve the protective and insulative qualities of location cases and other installations that house power supply and signalling equipment, enhancing electrical safety.

As part of this project, M&EE have been instrumental in driving both business and process change by introducing new standards, product specifications, calculation tools, test methods, work instructions and new technologies. The team have also been supporting asset managers and IP by providing expert guidance and advice for workforce training.

This new solution is now set to be rolled out across Network Rail's thousands of signalling power supply installations across the country.

STE in Action... Case Study

P&AM Peer Group – Signalling Wrong Sig Failure Management (SINCS)



SINCS (Signalling INCIDENT System) is our system of reporting and reviewing all Signalling Safety Related failure events and incidents (WSF's) to ensure they are classified according to level of risk and potential danger, and that they are monitored up to and including company executive level.

Within the Policy & Asset Management (P&AM) team this is accountability for the National Review of Sincs. The role of the reviewer provides independent assurance on behalf of the head of Signalling and checks the work of the Maintainer level for the most serious failures.

The most important part of the sincs process is to check the adequacy of the investigations for those most serious failures and where necessary, have the Maintainer level of investigator re-open inadequate investigations at the local route level. This process provides corporate assurance across Network Rail that the WSF's are being adequately and effectively investigated and managed to conclusion and ultimate closure of each individual incident. Key skills required include extensive knowledge of railway undertakings, supported by comprehensive technical skills and understanding of signalling principles, equipment and technology.

STE in Action... Case Study

European Train Control System (ETCS)



STE is leading the GB industry in developing the application rules and supporting operational rules for ETCS. The standard European product contains specifications of how the on-board systems will respond to stimuli from the trackside but not when (and if) those commands should be sent. Identifying the trackside principles and design rules will enable the operational and safety targets of the GB industry to be met.

The STE team contains experts in the technical specifications of ETCS, the operation of the GB network, the implantation of on-board systems and communications. Through a systems engineering approach the user requirements have been established through close collaboration with stakeholders throughout the industry and a series of reference designs produced. The team has derived the system and sub-system requirements and is now engaged on drafting compatibility tests to demonstrate that the train and track systems will work together.

3. Chief Rail Technology Officer



The Chief Rail Technology Officer does not have a direct team, but is supported closely by the Research, Development and Technology team who work within Buasiness Management and the Engineering team who lead on the standards work within Europe.

Andy Doherty is the Chief Rail Technology Officer for Network Rail, providing the vision and leadership to Network Rail's technology strategy, and leading Engineering interaction with the UK railway industry and within the European railway sphere.

In a climate when Great Britain have voted to leave the European Union, a consideration to the impact it may have on standards, funding and future programmes is a top priority, and one that sits within the remit of the Chief Rail Technology Officer.



Photo: Andy Doherty;
Chief Rail Technology Officer.

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STE in Action... Case Study Shift2Rail

Network Rail is a founding member of 'Shift2Rail', with the ability to influence the scope of the programme plan to ensure it is aligned to Network Rail's strategy and objectives.

Shift2Rail is a €1B European railway research and innovation programme that closely follows Network Rail's technical strategy covering all the near and radical long term track, switches and crossing, sub structure, bridge needs (indeed Network Rail leads this whole area), together developing the European Train Control System (ETCS) Level 3 system that we need for the Digital Railway, and which is a focus of the Engineering team.

The collaboration with industry partners, including the Office of Rail and Road (ORR), European Railways Agency (ERA) and our European infrastructure management equivalents, is essential to allow the success of ongoing strategies and programmes, and this is where the role of the Chief Rail Technology Officer is vital. Providing the link between our industry partners and the delivering teams within Safety, Technical and Engineering.



4. Environment and Sustainable Development



For us, sustainable development means making sure that everything we build, manage, service or develop today leaves a lasting positive legacy for future generations with the impact on the environment and society at the forefront of all decisions.

We believe that good management of our economic, social and environmental impacts is key to maintaining a strong and prosperous business. We will drive efficiency, build trust and create long term value for our stakeholders.

The team are focussing on helping the business realise the benefits of sustainable development which are aligned with driving performance improvement of the railway and improving our reputation as a business.

These include;

- Better environmental management e.g. reduced costs of waste, reduced delays to work through better management of protected species and invasive weeds
- Positive social performance e.g. improved relationships with communities
- Energy and carbon reduction
- Improved weather resilience and adaption to change e.g. fewer delays from extreme weather events



Photo: Samantha Hoe-Richardson, Head of Environment and Sustainable Development.

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STE in Action... Case Study

Energy and Carbon Management



Reduction in energy use and carbon emissions is a major part of the environment and sustainable development strategy. The efficient use of energy is critical to the running of today's railway and we must therefore work to minimise energy use where possible, reducing energy waste and improving the efficiency of our operations, whilst looking for opportunities to generate or own electricity, decentralising supplies and exploring power storage options.

Understanding and managing energy use in the UK rail industry is a difficult task. The nature of the infrastructure is complex – ranging from old Victorian equipment to modern-day electrification technology, all of which is shared between the many organisations that make up the rail network for Britain. There are many stakeholders who all play an integral part in moving towards a low-carbon rail network, not least within our own organisation. Each Route now has responsibility for meeting its' own targets on operational non-traction energy use and carbon emissions.

The Energy Management Team sits within Environment and Sustainable Development, and provide advice and guidance to business units on how to understand and reduce their energy use, costs and carbon emissions. The team also manage the vast amounts of billing process and data that our energy use generates. A key programme of the team is to work with each Route to identify opportunities to reduce energy consumption – from simple behavioural actions to more complex technical projects, with the overall aim of reducing carbon emissions by 11 % by the end of CP5 and saving £15.8m in the process.

To date, 7 out of 8 Routes have started on the programme, and savings opportunities of 15 % of total energy consumption have been identified through a series of workshops and action plans. These opportunities will now be developed into projects on the ground, and if fully implemented would save in the region of £6.5m each year.

If you would like to know more about our work on the work of the Energy Management Team, visit <http://sandsdhub.co.uk/sustainable-development/energy-and-carbon/>

STE in Action... Case Study

Positive social performance in local communities



A key part of the environment and sustainable development strategy is driving positive social performance locally. To support this we work with charity partners, including our employee selected charity of choice, and manage the Network Rail volunteer programme.

Up to five days of paid leave per year is available to employees volunteering with a UK registered charity or Network Rail led community engagement activity. At Network Rail, social performance is an integral part of our commitment to sustainability. The social performance strategy focuses our work in to two key themes: Caring for Communities and Improving the Passenger Experience and our volunteering programme is managed in the same way.

There are a lot of ways to get involved with the local communities and deliver positive social performance and the STE team is here to give you the tools and guidance to help you do that.

The team also manages our ongoing partnership with our charity of choice including facilitating employee fundraising, organising key sponsorship events, promoting payroll giving and delivering on our communications strategy to drive awareness of the charities work. We also organise 'gifts in kind' support including use of promotional space at our managed stations .

Our previous relationship with CLIC Sargent was valued at over £2million, well above the target value. If you want to know more about our work with charities and volunteering at Network Rail visit <http://connect/communities/charities/> or <http://connect/communities/charities/Volunteering/Default.aspx> (links accessible by Network Rail employees only).

STE in Action... Case Study

Environmental Support



The railway and its various structures consumes large quantities of limited natural resources during both construction and operation. Whether it's in the form of concrete for a structure, or consuming fossil fuels to provide electricity, environmental aspects play an important part in all railway investments. Network Rail is also the country's fourth largest land owner and it is expected by stakeholders to manage its estate responsibly.

One of the roles of the STE environment team is to understand the environmental risks and opportunities that affect Network Rail and to introduce innovative ways of working to ensure that environmental damage is limited and opportunities to enhance or restore the natural environment are taken advantage of.

Some examples of the support we provide include:

- Working closely with the various functions to deliver excellent environmental outcomes
- Developing and implementing new tools and techniques that support sustainable decision making
- Developing meaningful KPIs, reporting and environmental targets
- Providing support to specific projects to demonstrate the business value of good environmental management
- Support the development of the environment & sustainable development strategy

We provide support and guidance to the business on all areas of environmental management, including Network Rail's sustainability priority areas which are:

1. Materials and Waste Minimisation
2. Ecological Planning
3. Capital (embodied) Carbon



5.

Risk, Analysis and Assurance



As an organisation we are exposed to short and long-term risks across all areas of the business. We need to be effective with the management of these risks to make sure that we are able to deliver our organisational aims and objectives.

The Risk, Analysis & Assurance team provides an essential role in providing a deeper understanding of risk relating to safety, health, environmental and engineering performance. It also provides essential feedback on the implementation and effectiveness of our policies and control frameworks, through a combination of analysis, investigation and assurance activities.

The team are committed to developing improved ways to harness intelligence from our data, to enable more informed decision making and improve business performance.



Photo: Brian Tomlinson,
Director of Risk, Analysis and
Assurance.

Contact
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networkrail.co.uk](mailto:riskanalysisandassurance@networkrail.co.uk)



There are five teams that work together to meet this objective:

1. Investigation and Assurance

This team manages the accident and incident investigation and recommendation management processes as well as the SHE risk control framework, audit programme, engineering verification programme and supplier assurance and licencing framework. The team provide assurance for compliance with Network Rail's systems and controls for safety, health and environment and assesses our risk profile to ensure we are performing against our STE accountabilities.

2. Systems Analysis

This team provides technical leadership and delivery of formal capability studies of the whole railway system including: journey time and line speed assessments, scheme performance and capacity utilisation assessments, asset and our whole railway system reliability analysis and whole lifecycle cost assessments.

3. Advanced Analytics

This team develops and applies analytical methods, tools and models to optimise and evidence decisions on maintaining, renewing and enhancing the railway infrastructure. We provide the technical authority for Whole Life Costing and lead the modelling of Weather Resilience and Climate Change initiatives. We provide analytical support to key business activities, such as the development of asset policies, the preparation for regulatory funding reviews, the selection of assets for enhancement projects and the valuation of Network Rail's asset base.

4. Asset Management Analysis

This team analyses capabilities and competencies – specifically electrification and plant assets, and provide assurance to improve knowledge relating to the assets. The team also support our specific projects as required by STE stakeholders and other customers, providing insight to the business, central teams and routes, to help make informed asset management decisions through effective project based and continuous analysis, delivery of periodic asset and engineering level assurance within STE and the setting and monitoring of infrastructure key performance indicators.

5. Safety, Health & Environment Analysis & Reporting

This team manages the input of accidents and incidents into the Safety Management Information System (SMIS) and make sure our categorisation, reporting and investigations are completed inline with legislation and corporate standards.

STE in Action... Case Study Investigating Fairly

If we are to achieve our vision of 'Everyone Home Safe Everyday' then it is crucial that our investigations are completed consistently and fairly, upholding the Fair Culture principles we agreed to alongside our union colleagues in 2012 and again in 2014. Investigations should seek to understand why the incident happened and why people acted as they did, reaching the same conclusion regardless of where in the organisation they are being completed - the team are working to continuously improve guidance and support to ensure this happens.

We have an 'Establishing a cause' flowchart which shows investigators how we assess any unsafe acts identified during investigation, establish the cause and motivation for the action and respond fairly. The flowchart is supported by a 'consequences matrix' which can be used to determine appropriate consequences for any breaches based on the investigation findings. Normally consequences are supportive such as coaching or training but may, in some circumstances, involve a disciplinary investigation.

STE in Action... Case Study Managing our Risks

We have recently begun using a risk visualisation tool called the Common Risk Scoring Matrix for Safety (CRSM4S). The tool enhances our understanding of safety risk through comparison/visualisation and thereby enables better investment and decision making.

The objective is to ultimately replace the various scoring schemes currently being used – promoting a common safety risk language across the company and rail industry.

The STE re-organisation has centralised the accountability for key Network Rail risk tools. The vision is to establish a single risk platform that simplifies input, output and access for users for all Network Rail risk tools, utilising single models where appropriate and ensuring a consistent assessment of operational risks.

STE in Action... Case Study ERTMS – Whole Railway System Analysis

The European Rail Traffic Management System (ERTMS), mandated through the Technical Specification for Interoperability (TSI), is being deployed on the UK railway network through a national cross-industry programme. The systems analysis team have been supporting this programme since its launch: the design, development and commissioning of the ERTMS pilot application on the Cambrian Lines. Notably, our team have developed the UK national reliability specification for ETCS which is being used by cross-industry stakeholders deploying the system applications.

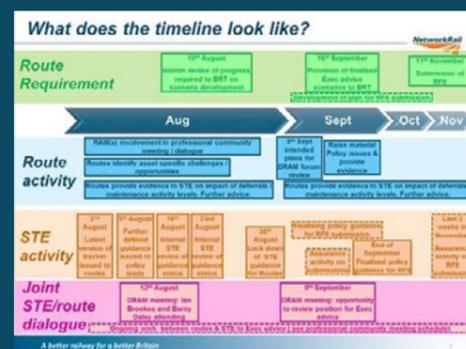


As part of our involvement with the ERTMS national programme we provide performance benchmarking and identification of performance drivers at railway system level. We also deliver product level and sub-system level Failure Modes, Effects and Criticality Analysis (FMECA) studies for both lineside and trainborne ETCS. We use VISION modelling to assess headways, scheme performance and capacity utilisation at route level in preparation for ETCS deployment.

The whole railway system reliability prior and post ETCS deployment is analysed through the development and application of our TRAIL model.

STE in Action... Case Study

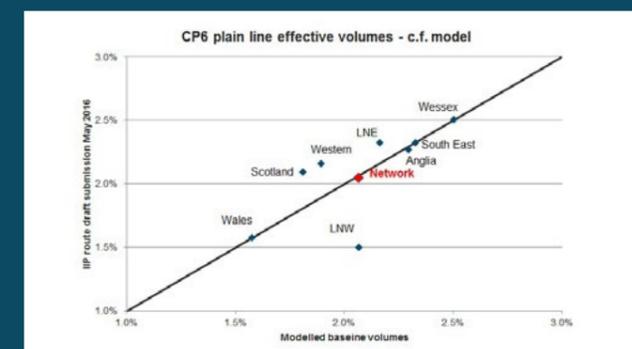
Electrical Power Policy Development



Leading the development and improvement of the Electrical and Power (E&P) Asset Policy. This involves, coordinating the Policy Governance Group (M&E Heads), leading communications with the Route Asset Management teams, policy workshops, technical review meetings, Policy SharePoint site, business planning, assuring Route submissions, facilitating cross discipline issue resolutions, updating the Policy document and liaising with the central Policy Programme, all to agreed programme milestones.

STE in Action... Case Study

Support to Strategic Route Asset Management Plans (SRAMPs)



In the devolved organization, the Routes produce bottom up asset renewal forecasts for the next control period (CP6). At each iteration of the Route plans, we have modelled the proposed renewal workbank for CP6 and projected forward by 35 years to CP12 in order to demonstrate that continued application of the asset policies will deliver the required level of infrastructure performance without the creation of renewal backlogs i.e. decisions taken now are sustainable in the long term. The modelled forecasts are a critical source of evidence assessed by ORR in reaching the determination of Network Rail’s funding requirements.

6. Business Management



Business Management provides programme management capability to drive the successful delivery of STE projects and programmes and is led by Simon Warner; Head of Business Operational Programmes.

There are three Programme Management teams within Business Management:

Research, Development and Technology

The team specialises in research, development and technology for Network Rail. This includes leading the development and operation of the Rail Innovation and Development Centres which provides test track facilities to the rail industry. This team is managed by Alison Smith.

Maintenance Effectiveness

The Maintenance Effectiveness (ME) programme delivers national projects that support safe, efficient and sustainable train performance. Each project within ME helps to contribute to improving train performance (PPM), through reducing infrastructure delay causing incidents, improving how we maintain our assets, improving asset reliability, increasing productivity, reducing safety risk and identifying potential faults – enabling proactive instead of reactive maintenance. The ME projects work together in a continuous cycle to find, predict, plan and do (maintenance activities) safely and sustainably. The team is managed by Justin Davis.

STE Projects

This team provides Project Management support, where required, for the rest of STE's projects. This team is managed by Steve Longden.

The Programme Management provision to STE includes support from project planning and commercial management experts. Other capabilities in Business Management include:

Resource Management

Management of the STE workbank and forecasting of all STE resources, providing recommendations on resource management solutions, based on work priority, to alleviate critical resource constraints.

Reporting

Production of management reports that provide visibility of; project performance, key milestones, cost forecasting, baseline management, resource requirements, timecard compliance. All reporting is brought together in a periodic issue of the STE Project Book document.

Communications

The team owns the STE communications strategy and provides a central communications service to all of STE.

Governance

Own a robust suite of “Ways of Working” documentation that contains consistent processes and procedures for the way STE delivers its work.



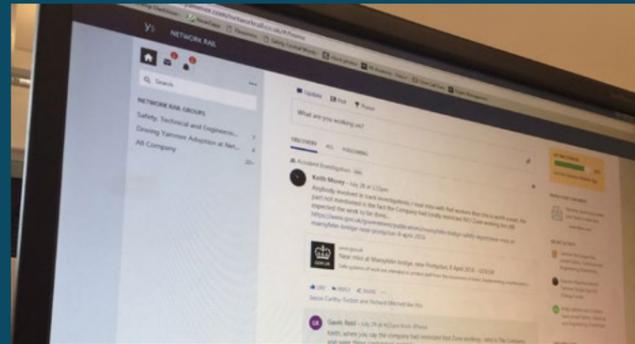
Photo: Simon Warner;
Head of Business Operational
Programmes

Contact

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STE in Action... Case Study Communication is Key

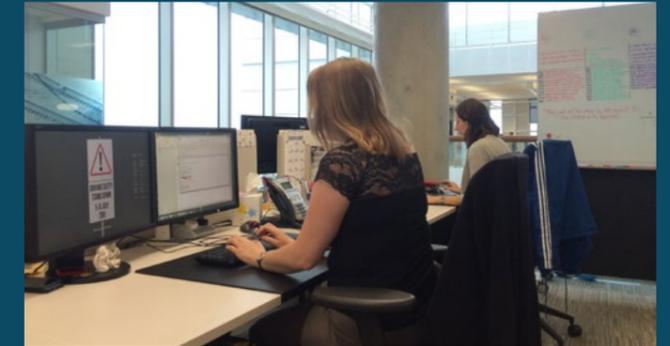


The STE communications team share information within the STE function, as well as communicating our key national campaigns, projects and programmes out to the wider organisation. Recent campaigns have included Close Calls, Lifesaving Rules refresh and winter safety.

We have a wealth of channels available to help us share information with our audiences based on the resources they have available to them and the information they need to receive. These channels include; STE newsletter, Safety Hour Discussion Packs and the Safety Change Network.

The team has a strategy in place to ensure we cater for the needs of our colleagues in STE and to allow us to plan effectively, future-proofing our channels and achieving innovation in delivery.

STE in Action... Case Study Business Planning Team



The Business Planning Team is a small team of four that services the entire STE community.

The role of the Business Plan Team within STE is to provide planning & governance support across all functions, ensuring that an accurate, prioritised workbank is maintained. The workbank contains all projects and business as usual activities that STE resources are assigned to.

We are aligned as business partners to each area of STE providing resource level information to intelligently identify resourcing shortfalls and offer flexible solutions to support temporary or permanent recruitment needs.

A key aspect of the Business Planning Team is to chair the periodic Change Management Panels. These are capability-specific forums that act as stage gates in accepting new work into the STE workbank. We provide visibility to all stakeholders of project priorities, resource requirements, funding decisions, delivery methods and project schedule in order for decisions to be made on accepting proposed new works into the workbank. The Panels also review change control to existing items in the workbank.

Additionally, we provide the governance around a compliant timecard process for STE. The data produced from timecard submissions drives reports on productivity, recoverability of costs and understanding the effect required to deliver projects.

STE in Action... Case Study Hitachi Rail Europe aerodynamic testing at RIDC Melton



The Rail Innovation & Development Centre (RIDC) team manages RIDC Melton and RIDC Tuxford – the two test facilities owned and operated by STE on behalf of Network Rail and the rail industry. The RIDC's provide a safe operating environment for the testing and validation of new and modified rolling stock, plant, on track machines, infrastructure, equipment and technology. By testing at either site it helps to remove the risks of new trains, plant, infrastructure and products and ensures they are safe and reliable before they are put into service/use on the mainline railway.

The role of the RIDC team within STE is to lead, manage and operate the two sites safely and efficiently whilst delivering for our customers on site which include train manufacturers, train, freight and plant operators and companies, suppliers, academia, and other Network Rail teams including Route Services, Telecoms and Digital Railway.

Hitachi Rail Europe came to RIDC Melton in March 2015 to undertake testing and validation of the new Class 800 Super Express Train which will be put into service on both the East Coast and Great Western mainline – see picture above.

One of the most recent tests completed during their final testing phase was the aerodynamic slipstream effects on track, and pressure pulses measurement in the train crew area and passenger saloon undertaken through Stanton Tunnel, one of the four tunnels on site, to ensure that the train is compliant to legislation, standards and contractual requirements before it is released for service. The purpose of the full scale test is to collect data from measurements on open track and in tunnels. In order to carry out the above, the Technical Specification for Interoperability (TSI) requires a tunnel without air shafts being present for the test. There are three shafts in Stanton Tunnel and these had to be closed to allow testing to commence. The innovative solution was to fit a rubber balloon into each of the shafts which allowed the successful completion of the test. The aerodynamic loading depends on the following parameters:

- running speed of the train with max speed of 200 km/h
- distance between the object and the train(s)
- geometry of the train(s)
- geometry of the object
- ambient wind effects

For further information about the RIDC's, please visit www.networkrail.co.uk/ridc

STE in Action... Case Study Load vs. Capacity Resource Graphs



The Business Information team supports STE with the management of their workload and resources, and one of their most prominent outputs is the 'Load vs. Capacity' resource graphs.

These graphs plot the planned workload of teams within STE against the number of people they have available to work on them. Using this information, STE managers are able to identify bottlenecks or shortfalls in scheduled work and make decisions accordingly – for example, to move work forward or back in time depending on when resource is available, or to prioritise certain pieces of work during congested periods. Another use of the graphs has been to provide evidence of future resource requirements when applying for new recruitment actions.

Creation of the graphs involves the combination of several disparate data sources, including the STE organisational structure, individual employees' availability information (how many hours they can spend on project/managed service work each period), the STE workbank of current and planned work items, and the timecard bookings of STE employees in recent periods (to compare with future plans).

Over 80 sets of the Load vs. Capacity graphs are updated periodically for different teams around STE. These are currently distributed via email only, but are available upon request from the Business Information team.

7.

Finance



The finance team review, report on and challenge all expenditure throughout STE; it is essential teams and projects keep to budget enabling us to fulfil our commitments to both the delivery of agreed works and achieving efficient spending.

Responsible for financial control and governance and assurance and audit of network-wide cost and volume, the team also play a key role overseeing reporting and assurance of volume delivery to ORR.

The team support the assessment of financial efficiency, longer-term business planning and regulatory guidance for research, development and innovation throughout the organisation and wider industry.

The team plan for the future, considering innovative ways to increase our return on investment.



Photo: Adrian Golumbina,
Director of STE Finance.

Contact

STE in Action... Case Study

STE Finance Governance and Operations Team



The team provides support and governance in relation to both operating and capital expenditure.

Working with the Exec team and across all STE business areas and projects we ensure that robust financial process and governance is embedded in the STE organisation helping to guide and shape business decisions by identifying financial impacts.

Governance

- Facilitate forecast and business plan submissions to group
- Monitor and track performance against forecast and budget
- Provide exception reporting and breach of governance reports and actions
- Review investment papers and attend programme boards
- Ensure financial regulations are adhered to across the STE organisation
- Embed best practice financial processes

Operations

- Provide advice and guidance to business partners; Investment, forecasting and budgeting
- Understand each business area to appreciate context and maximise the impact of our support
- Maintain a strong network of support with the wider finance community to leverage wider experience and expertise
- Challenge the status quo to drive efficiencies and improvements to deliver the right outcome for NR
- Lead and support business cases and investment decisions for STE

STE in Action... Case Study

STE Finance Development Team



The STE Finance Development Team seeks to find innovative ways of working in the STE directorate and beyond via various means:

- Working with the executive team to analyse the strategic direction of STE and finance benefits sitting behind them
- Working with the business management team to analyse the productivity and capability of the function
- Supporting the research, development and technology team on incremental and step-change solutions for the business - including the test track facilities

- Supporting Shift2Rail and Strategic Research Partnerships on seeking innovative funding models for NR
- Facilitating and costing the STE functional Initial Industry Plan (IIP) submission
- Facilitating and costing the technical element IIP submission
- Developing the Finance function for the future by managing the graduate scheme and sponsoring the Finance internship, industry placement and apprenticeship schemes; and developing training and performance management guidance

STE in Action... Case Study

STE Business Performance Team

The Business Performance team, within STE Finance, occupy the space between finance and asset management; aiming to bring the two closer together to drive long-term improvements in business planning and reporting across Network Rail through our three core deliverables;

- Supporting our Asset Heads and Chief Engineers through the provision of Cost and Volume information and analysis to underpin STE's collective assurance activity
- Managing the interface with the route asset management and finance communities to drive robust, high quality, compliant reporting to fulfil our internal/external obligations.
- Providing insight on delivery, variances to plan, and any associated impact on long-term sustainability, to both NR's exec and ORR on a regular basis.

Acting as Finance's asset management experts, we also work closely with Group Finance and the Business Review Team to ensure that interlinked definitions, financial efficiency declarations and reforecast processes are independently evaluated and agreed. By authoring and latterly owning the Cost and Volume Handbook, we provide unified guidance to every route and deliverer to drive better understanding across Network Rail as a whole.

Another important activity undertaken within the team is regularised audit of Cost and Volume; a programme which was developed in response to a Regulatory Escalator item, but, long-term, aims to remove the need for independent reporter work in this area. The rolling audit programme, instigated in 2015/16, has been developed in conjunction with ORR and has already highlighted gaps in process or knowledge which will be addressed.

Lastly, looking forward to CP6, the team are set to play an important role in setting our CP6 reporting frameworks and assuring our Initial Industry Plan (and later Strategic Business Plan) submissions for Cost and Volume. As a team we strive to support the business and have developed a strong network of business partners within STE, our routes and delivery organisations.

In short, we aim to promote long-term, sustainable improvements in reporting and aspire to provide high quality narrative to either aid effective decision making or underpin Network Rail's credibility with external parties. We have developed good, strong relationships with a plethora of stakeholders across the business, but we are always striving to grow our network and offer better, more widespread, support across the board.





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Working for you.