NTAR

NATIONAL TRAINING
ACADEMY FOR RAIL

The Digital
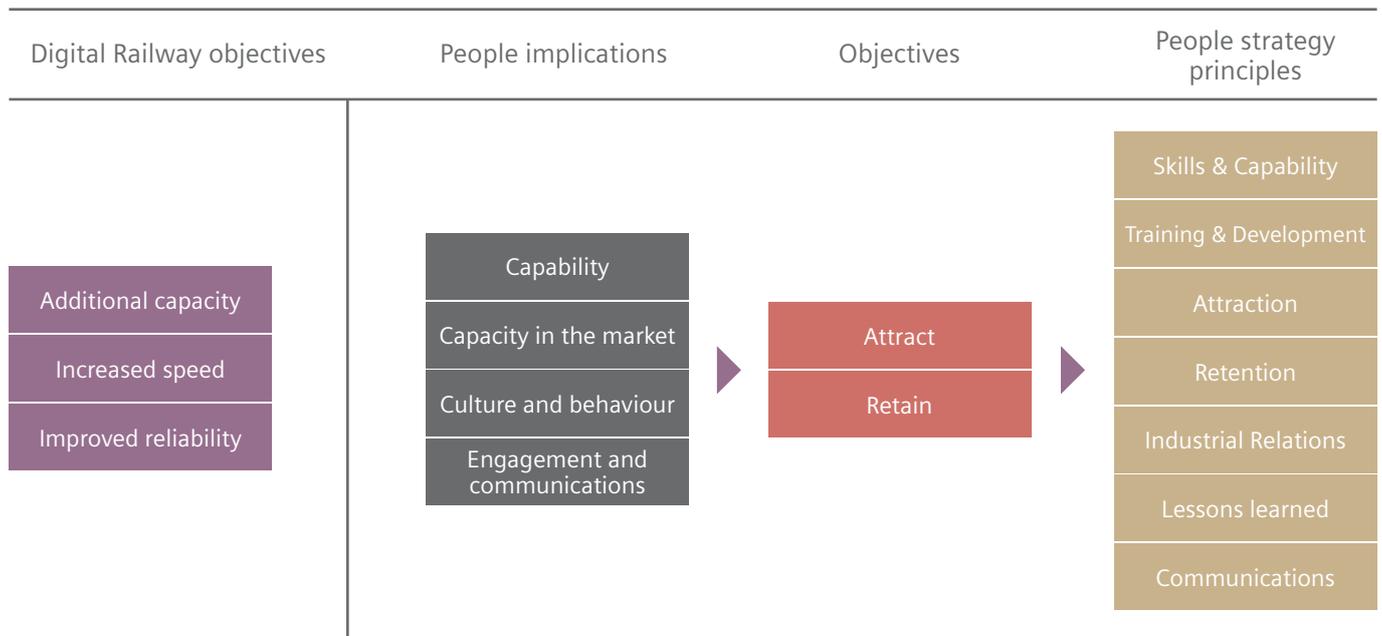# Railway Courses

Contents

Digital Railway is the industry's programme to modernise train signalling, command and control systems over 25 years.

Our railway carries twice as many passengers as it did just two decades ago but demand is set to rise still further in the years ahead. Digital Railway is a key element of the industry's approach to transform capacity, speed and safety of the current network by accelerating the digital modernisation of the railway. More trains will run on existing tracks – safer, faster and more cheaply – helping to increase the impact of vital upgrades like HS2 and Crossrail, ultimately delivering the objectives of more trains, with better connections and greater reliability.

What are the key elements of the Digital Railway Industry People Strategy?

The Digital Railway Industry People Strategy recognises that the Digital Railway programme has a great people impact both in terms of requiring significant volume of new people in addition to re-shaping the skills, relationships and behaviours of those already in the industry. In turn, the strategy defines some key strategic principles in addition to identifying next steps in delivering the people needs the Digital Railway programme requires.

Digital Railway Industry People Strategy summarised

Digital Railway objectives	People implications	Objectives	People strategy principles
Additional capacity	Capability	Attract	Skills & Capability
Increased speed	Capacity in the market	Retain	Training & Development
Improved reliability	Culture and behaviour		Attraction
	Engagement and communications		Retention
			Industrial Relations
			Lessons learned
			Communications

Specialist Apprenticeships and short form courses - how NTAR and its partners can support the needs of Digital Railway.

The National Training Academy for Rail (NTAR) and its specialist Telecoms partner ADComms have worked to respond to the current position of an overall shortfall in current and future skills, an issue often exacerbated by separate silos of skills in survey, installation, electrical and telecoms functions. The range of initiatives and projects attached to the digital agenda are extensive and include upgrades to distribution and access layer networks, high speed on-board connectivity to the train, ERTMS deployment and major infrastructure builds such as HS2. All this drives a requirement for competent digital and telecoms skills.

NTAR and ADComms have therefore developed a catalogue of both short form courses in addition to a longer term specialist apprenticeship scheme, created to develop a generation of telecoms and network infrastructure engineers with skills in fibre, copper and data. This is designed to develop a workforce with joined-up, integrated 'single visit' competencies across all of build, commission, testing, maintenance and integration (including AC competence and panel wiring).

These skills are essential to the wider programme elements of the Digital Railway, in particular providing a strong link to successful ERTMS deployment - covering all of electrical, fibre, data and copper as well as GSM-R replacement. These skills are of value to a broad range of organisations and audiences - new joiners, existing technicians and managers within:

1. TOCs
2. Infrastructure owners
   (such as Network Rail/ TfL)
3. Specialist OEMs
4. Specialist maintainers/ installers
5. Non rail telecoms providers

Our schemes and courses develop expertise in the following systems

1. Networks
2. Passenger Information Systems
3. CCTV
4. PA systems
5. Security
6. Access control
7. High speed wifi to the train
8. Off-grid power

The value of the NTAR and ADComms partnership

The benefits of our partnership are extensive – pooling resources, investment and facilities, bringing together both rail and telecoms with unique expertise and reach.

Together this partnership provides:

- Specialist facilities at Scunthorpe and Northampton
- Strength with the respective parent companies of Siemens and Panasonic
- A significant footprint in rail training with TOCs, manufacturers and Network Rail
- A partner college network with established nationwide reach

Digital Railway Industry People Strategy Next Steps

Next steps identified in the strategy	How we can support
Address operational, contractual or commercial requirements	• Provision of market leading training facilities • Development of apprenticeship schemes that develop vital enabling skills and capacity in data and telecoms, harnessing existing standards and levy funding • Schemes relevant to a wide range of businesses in the industry providing competency in essential digital systems and networks • Development of 'single visit' occupational competency that brings together previously disparate roles • Collaborating to bring together expertise from specialist businesses and colleges
Elaborate detail of industry skills gaps and capability needs	
Develop strategies for future training of staff	
Development of career pathways for Digital Railway people	
Talent management strategies to attract, retain and develop	

About ADComms

ADComms, now a Panasonic company, specialises in delivering next generation technology to the rail industry. With origins in Ericsson, ADComms has forged a reputation for technological excellence, bringing together ideas from multiple telecommunication platforms to create unique innovative solutions. The ADComms manufacturing HQ in the North of England forms a hub for the administration of its regional and transient project offices across the UK as well as housing its technical training academy. With heavy focus on the acquisition of practical engineering skills, ADComms draws on its direct industry links to deliver up-to-date training products that ensure learners are prepared for work in the rail industry by people of the rail industry.

Apprenticeships
Level 3 Rail Telecommunications Apprenticeship

Maintenance & Operation Engineering Technician (MOET) Apprenticeship Standard
Programme Elements

Based on the Electrical System and Process Control Pathway of Maintenance and Operation Engineering Technician Standard, NTAR's Digital Railway apprenticeship programme Is new for 2018.
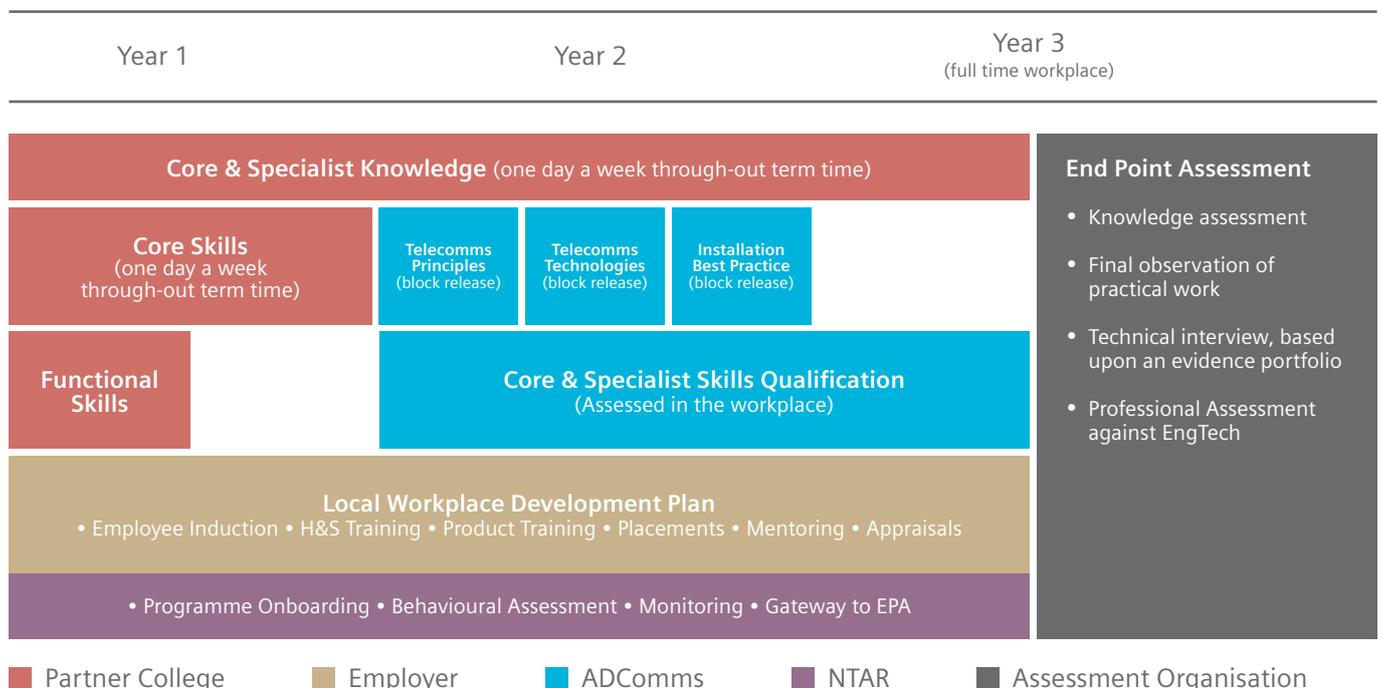
Taking full advantage of our partner network and our telecoms equipment , this new programme will support learners in developing the technical, occupational, and professional competence required for a successful career in rail engineering.

Successful candidates will progress through a sequence of off and on-the-job learning activities, including:

• Working safely in rail engineering
• Electrical wiring and testing of circuits and devices
• Installation Best Practice
• Electrical and electronic principles
• Project management
• Telecommunications Technologies
• and Telecommunications Principles

And achieve a nationally recognized Level 3 engineering and rail-engineering qualifications.

MOET Programme Delivery: day release for three years

Year 1	Year 2	Year 3 (full time workplace)

	End Point Assessment
Core & Specialist Knowledge (one day a week through-out term time)	• Knowledge assessment
Core Skills (one day a week through-out term time) / **Telecomms Principles** (block release) / **Telecomms Technologies** (block release) / **Installation Best Practice** (block release)	• Final observation of practical work
Functional Skills / **Core & Specialist Skills Qualification** (Assessed in the workplace)	• Technical interview, based upon an evidence portfolio
Local Workplace Development Plan • Employee Induction • H&S Training • Product Training • Placements • Mentoring • Appraisals	• Professional Assessment against EngTech
• Programme Onboarding • Behavioural Assessment • Monitoring • Gateway to EPA	

Legend: ■ Partner College   ■ Employer   ■ ADComms   ■ NTAR   ■ Assessment Organisation

NTAR will deliver apprenticeship programmes against both the Maintenance & Operation Engineering Technician (MOET) standard and the Rail Engineering Technician (RET) standard. There is one significant difference between the two programmes: the MOET standard version includes the Installation Best Practice course, but not the ADP, the RET standard version includes the ADP, but not the Installation Best Practice Course.

Element	Delivered by	In Year	Levy Funded?
Programme Management Administration directly linked to the training, education and end-point assessment related to the delivery of the apprenticeship, including: - Learner registration on to Standard - preparation of Training Services Agreement, with Payment Schedule - support with Apprenticeship Agreement - preparation of the Commitment Statement - Apprenticeship Service Account support - government incentive(s) check, and administration - management of funding - management of Apprentice Evidence Pack - Learner login for OneFile (online Competence Qualification Evidence Folder), and Learner training - programme reporting - programme quality assurance and verification - support with the workplace development plan	NTAR	1,2,3 Throughout the programme of study	Yes
Monitoring Review and Behaviour Assessment - Regular Learner monitoring, including full Behaviour Assessment. Records shared with Employer	NTAR	1,2,3 Throughout the programme of study	Yes
Local Workplace Development Plan An agreed plan of development activity aligned to achieving occupational and professional competence, including: - employee onboarding - site induction(s) - placements - business/product training - CSR activity on behalf of the Employer - team building and social activity - workplace supervision - workplace mentoring - alignment to Employer CMS (where applicable)	Employer	1,2,3 (when not at college)	No
College Support Learner care, management, and reporting at college, including: - college induction - regular Learner monitoring, including full Behaviour Assessment. - weekly 'Snap Shot' Behaviour Assessment activity, where requested - termly Learner progress report - absence, sickness, and behaviour reporting Records shared with Employer	Partner College	Throughout the programme of study whilst at college	No
Programme Onboarding Face-to-face programme induction (including enrolment, and briefs on Equality & Diversity, Safeguarding, and Prevent Duty)	Main Provider	1 (start of programme)	No
Supplementary Online Induction Learner access to online Get up to Speed with The Railway	Main Provider	1 (online)	No

Element	Delivered by	In Year	Levy Funded?
Performing Engineering Operations Units Development activities agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing the development of the range of conventional skills and knowledge required to safely and effectively position, assemble, install and dismantle plant and equipment to agreed specifications. - Working safely in an engineering environment - Carrying out engineering activities efficiently and effectively - Using and communicating technical information - Wiring and testing electrical equipment and circuits - Forming and assembling electrical cable enclosure and support systems - Assembling, wiring, and testing electrical panels/components mounted in enclosures	Partner College	1 Throughout the programme of study whilst at college	Yes
Functional Skills qualification in English at Level 2 Where required	Partner College	1 Throughout the programme of study whilst at college	No (but funded separately)
Functional Skills qualification in Mathematics at Level 2 Where required	Partner College	1 Throughout the programme of study whilst at college	No (but funded separately)
Pearson BTEC Level 3 National Diploma in Electrical and Electronic Engineering Knowledge qualification agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing the development of the range of core knowledge described in the standard. Includes registration, certification, and delivery of the following units agreed by the Main Provider and Employer to ensure the outcome delivers depth, breadth and stretch to enable progression: - Engineering Principles - Delivering of Engineering Processes Safely as a Team - Engineering Product Design and Manufacture - Applied Commercial and Quality Principles in Engineering - A specialist engineering project - Electrical Installation of Hardware and Cables - Electrical Machines - Electronic Devices and Circuits - Digital and Analogue Electronic Circuits - Calculus to Solve Engineering Problems	Partner College	1, 2 Throughout the programme of study whilst at college	Yes
Telecommunications Principles Unit Specialist unit agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing the specialist skills and knowledge required to: - carry out planned, unplanned and preventative maintenance procedures on integrated plant and equipment - replace, repair and/or remove components within integrated plant and equipment and ensure its return to operational condition within a rail telecoms context, covering: - FTN Networking and Connectivity for Commissioning Staff - GSM-R Overview - Cyber security	ADC	2	Yes

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| Element	Delivered by	In Year	Levy Funded?
Telecommunications Technologies Specialist unit agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing the specialist skills and knowledge required to: - diagnose and determine the cause of faults within integrated plant and equipment - calibrate and configure integrated electrical apparatus, systems and process control equipment within a rail telecoms context, covering: - Railway FTN/GSM-R Network Overview - Railway IP Systems Commissioning - Networking Fundamentals	ADC	3	Yes
Installation Best Practice (10 Days) Development activity agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing specialist skill in the positioning, assembling, installing and dismantling plant and equipment which will include instrumentation to agreed specifications.	ADC	2 or 3	Yes
Level 3 EAL Diploma in Rail Engineering Technician Competence Competence qualification agreed by the Main Provider and Employer as the mechanism for supporting the Learner in evidencing the development of the range of core and specialist skills described in the standard. Includes registration, certification, and delivery of the following units agreed by the Main Provider and Employer to ensure the outcome delivers depth, breadth and stretch to enable progression: - Complying with Statutory Regulations and Organisational Safety Requirements in the Rail Industry - Using and Interpreting Engineering Data and Documentation - Working Efficiently and Effectively as a Rail Engineering Technician - Determine Requirements for the Safe Access to Work Locations for Telecoms Engineering - Establish Information for Telecoms Engineering Maintenance and or Fault Finding - Establish Information for Telecoms Engineering Installation - Establish information for Telecoms Engineering Testing - Organise Local Telecoms Engineering Activities - Contribute to Technical Leadership of Telecoms Engineering Activities - Allocate and Monitor Resources for Telecoms Engineering Activities - Reinstate the Work Area after Telecoms Engineering Activities - Transfer Responsibility of Telecoms Assets - Conduct Specified Testing of Telecoms Systems - Carry Out Replacement of Components from Telecoms Assets - Carry Out Removal of Components from Telecoms Assets - Adjust Telecoms Components and Equipment to Meet Operational Requirements	ADC	2,3 (delivered in the workplace between September Year 2 and June Year 3)	Yes
Gateway to End Point Assessment Facilitation of End Point Assessment, undertaken by an independent assessment organisation: - Knowledge assessment (weighting 20%). - A final observation of practical work (weighting 40%) - A technical interview, based upon an evidence portfolio which will include all evidence of practical observations, progress reviews and work activities (weighting 40%) - Professional Assessment against EngTech requirements, assessed by the PEI	Main Provider / Assessment Organisation	3 (with elements in the workplace)	Yes

Digital Railway is a key element of the industry's approach to transform capacity, speed and safety of the current network by accelerating the digital modernisation of the railway.

Advanced Telecoms

"Sophisticated telecommunications networks quietly form the technical arteries of the UK rail infrastructure"
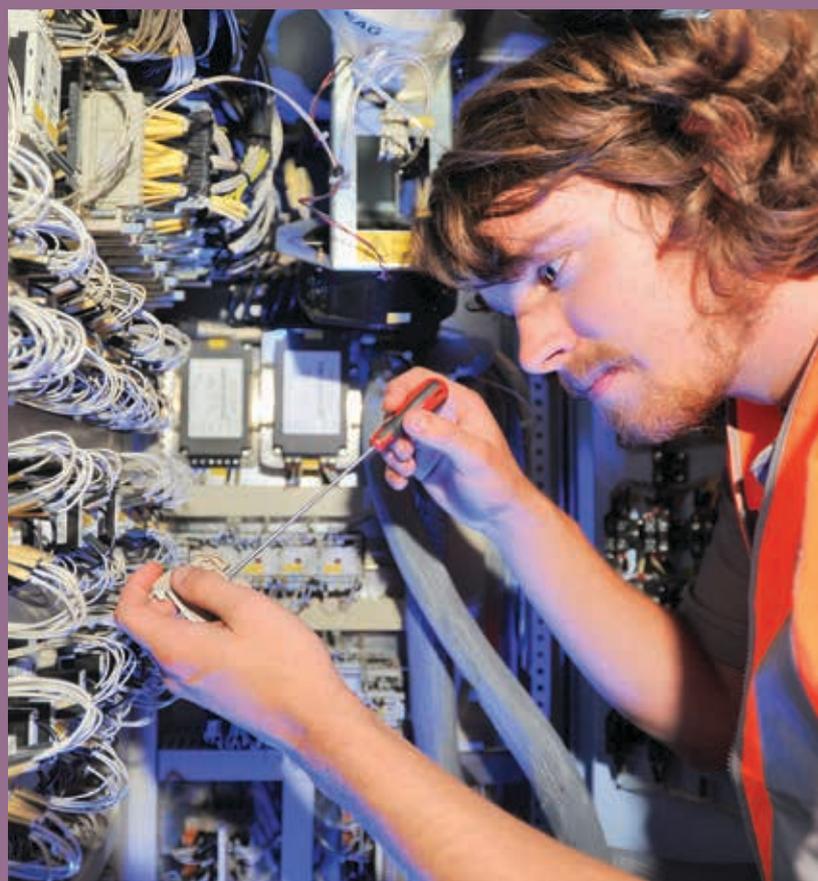
Introduction

When most of us think about telecommunications networks, what we usually have in mind are voice calls, text messaging and internet access. On the railway network however, telecoms technology is far more advanced: it controls the equipment that keeps trains on the tracks and passengers safe. Whenever high speed trains are involved, accuracy matters.

Sophisticated telecommunications networks quietly form the technical arteries of the UK rail infrastructure. Highly skilled telecommunications engineers use ultra-modern processes, techniques and equipment to install, commission and maintain one of Europe's most robust safety-critical telecoms networks. A Railway Telecommunications Engineer needs to be able to draw on an extensive catalogue of skills to deliver engineering projects to the impeccable standards required for high speed rail.

Railway telecommunications systems use three main transmission mediums – copper wiring, optical fibre cable and radio transmission – to carry a whole range of different services, including signalling; on train information systems; station information and dispatch systems; and GSM-R communications: all combining to make the concept of the digital journey a reality.

NTAR will take delegates seeking a career in this field through the whole asset lifecycle: from overview to installation to commissioning and finally maintenance of the installed system.

To start your employees on their digital journey, talk to us about our technical modules set out in this directory.

Overview

| Installation Optical Fibre | Installation Copper | Installation Platform |

Commissioning Networking

Maintenance

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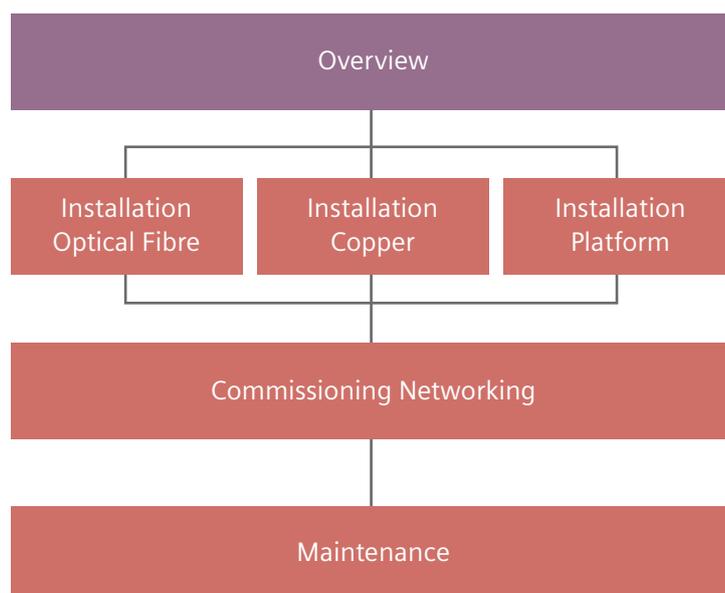
The Digital Railway: Overview Courses

Railway FTN / GSMR Network Overview

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will give the student a high level understanding of how the FTN/GSMR network works and what services it provides within the Rail environment and will include:

- A practical walk round within our indoor rail telecoms environment*
- Entry into real life Railway FTN/GSMR equipment rooms & track side enclosures*
- An explanation of how all components fit into the network and the services it provides
- Reference diagrams of all network components with detailed notes

Key Outcomes
An understanding of the telecoms network for UK railways.

Requirements
There are no specific requirements for this course.

*Includes a fibre splice practical test.

Location
Northampton or In-house

Duration
1/2 Day no practical
1/2 Day with practical*

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:

- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

Developed and delivered in partnership with

ADComms

The Digital Railway: Overview Courses

Railway Telecoms REB DC Power

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton or In-house

Duration
1/2 Day

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when working with DC power
- Health and safety considerations when working with heavy loads
- Health and safety considerations when working with electrical test equipment
- Battery Chemistry and Safety Implications
- Chargers, Power Supplies and Solid Sate Switches
- Circuits breakers, Fuses and Surge Protection
- Operational Testing, Load Testing and Fault Finding

Key Outcomes
An understanding of the power requirements for Fixed Telecoms Network and GSMR networks on UK railways.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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Railway Customer Information Systems

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:
- Health and safety considerations when working at height on platforms
- Health and safety considerations when working with electrical test equipment
- Fire Alarm Links and Implications
- Display Types
- Display Cabling
- Introduction to Structured Cabling
- Introduction to Local Fibre Cabling and Connectors
- Back Office Systems
- Local Control
- Remote Control & PA Links

Key Outcomes
An understanding of the Customer Information Systems operating on UK railways.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Northampton or In-house

Duration
2 Days
To be combined with **NTAR 1056**

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:
- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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ADComms

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Station
PA Systems

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when working with high power amplifiers
- Health and safety considerations when working at height on platforms
- Health and safety considerations when working with electrical test equipment
- Underground or Section 12 Systems
- Fire Alarm Links and Implications
- Local and Long Line PA System
- Amplifiers and Power Ratings
- Local Control Panels and fixed point Microphones
- Wireless Microphones
- Speaker Types and Speaker Wiring
- Recorded Message Machines
- Voice Recorders

Key Outcomes
An understanding of the Stations PA systems currently operating in UK railways.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Northampton or In-house

Duration
2 Days. Combined with **NTAR 1055**

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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The Digital Railway: Overview Courses

Networking Fundamentals

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Ethernet and TCP-IP Introduction
- ADSL, Routers, Switches and IP Addresses
- Introduction to Structured Cabling
- Patch Panels and Connectors
- Testing Structured Cabling
- Fibre Cabling, Patch Panels and Connectors
- Testing Fibre Link Cables

Final Day
Cyber Security Overview.

Key Outcomes
An understanding of the Internet Protocol Systems currently operating on UK railways.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Northampton or In-house

Duration
3 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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The Digital Railway: Installation Courses

Railway Optical Fibre Cable Joint Preparation and Splicing

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton or Specialist Centre

Duration
4 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when working with Optical fibre cables
- Routing of Optical fibre cables in Rail approved containment (both armoured & DISAC)
- Preparation of Optical fibre cables for jointing (using rail approved tyco fist enclosures)
- Bare fibre management within the tyco fist enclosure (including DISAC colour codes)
- Cleaving and splicing techniques for single mode and multi mode optical fibre cable
- Sealing and correct labelling of railway telecoms enclosures

Key Outcomes
An understanding of the techniques employed in Railway Optical Fibre Cable joint preparation and splicing.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Other courses you may be interested in:
- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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The Digital Railway: Installation Courses

Railway Optical Fibre Testing and Result Analysis

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the an office environment with regards to:

- Use of OTDR analysis software for Managers that want to validate optical test results. In this module each student will be taught how to measure losses of optical cables, including units of measurement, jargon busting and FTN/GSMR loss standards.

This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when working with Optical fibre cables
- Optical transmission safety for LASER & LED systems
- Optical test equipment care and cleaning of test equipment & connectors
- Recording of optical loss measurements
- Bi-directional loss measurement analysis (using desktop OTDR software)
- Loss parameters for FTN/GSMR network
- Wavelength and pulse width selection including full OTDR setup procedure
- Fault finding using OTDR distance markers and fault rectification procedure
- Network fibre tracing with visual LASER light using our FTN replica network

Key Outcomes
An understanding of the techniques employed in Railway Optical Fibre Testing result analysis.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Northampton or Specialist Centre

Duration
4 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:
- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

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ADComms

The Digital Railway: Installation Courses

Railway Cable Avoidance Tool (C.A.T & GENE)

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when excavating around buried services
- Use of the Rail approved Radio Detection C.A.T3 & C.A.T4 with GENE
- Cable avoidance techniques when excavating in a Rail environment

Key Outcomes
An understanding of the techniques employed in Railway Cable Avoidance tools.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Northampton or Specialist Centre

Duration
1 Day

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Aerial Rigging for Railway GSMR Structures
- Installation Best Practice

Developed and delivered in partnership with

ADComms

The Digital Railway: Maintenance Courses

Aerial Rigging for Railway GSMR Structures

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when working on a GSMR structures
- RF awareness training for GSMR structures (public & workforce exposure limits)
- Advanced climber initial certification or re-certification
- Tower rescue & casualty care at height
- Aerial rigging of GSMR structures using 29m lattice mast & 15m mono pole
- Lowering of Mono poles using hydraulic ram
- Leaky feeder installation & tunnel repeater installation
- Rapid repeater antenna replacement
- Connectorization of radiating cables & other RF cables used within GSMR
- Testing of feeder & leaky feeder cables

Key Outcomes
An understanding of the techniques employed in Aerial rigging for Railway GSMR Structures.

Requirements
An understanding of rail telecoms and an overview of the telecoms technology on UK railways.

Location
Specialist Centre

Duration
3 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Installation Best Practice

Developed and delivered in partnership with

The Digital Railway: Maintenance Courses

Installation
Best Practice

Qualification
NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton

Duration
10 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
Signalling & Telecoms (S&T) Managers, S&T Engineers, S&T Maintenance Staff, S&T Project staff

Learning Objective/Course Overview
This module will prepare the student for work in the rail environment with regards to:

- Health and safety considerations when manually handling heavy equipment.
- Health and safety considerations when working with batteries
- Locating equipment from site plans
- Installing equipment
- Installing cable management systems
- Installing cables (power Telecoms and fibre)
- Cable preparations
- Fitting cable labels
- Cable testing
- Battery installation
- Completion of 'As Built' information

Key Outcomes
To be able to install equipment in a correct and safe fashion, in accordance with the manufacturer's specification.

Requirements
Telecoms equipment and associated cabling installation best practices, designed for students or engineers participating in telecoms modules.

Other courses you may be interested in:

- Railway FTN / GSMR Network Overview
- Railway Telecoms REB DC Power
- Railway Customer Information Systems
- Station PA Systems
- Networking Fundamentals
- Railway Optical Fibre Cable Joint Preparation and Splicing
- Railway Optical Fibre Testing and Result Analysis
- Railway Cable Avoidance Tool (C.A.T & GENE)
- Aerial Rigging for Railway GSMR Structures

Developed and delivered in partnership with

ADComms

ERTMS

> "Biggest change in the railway in many generations"
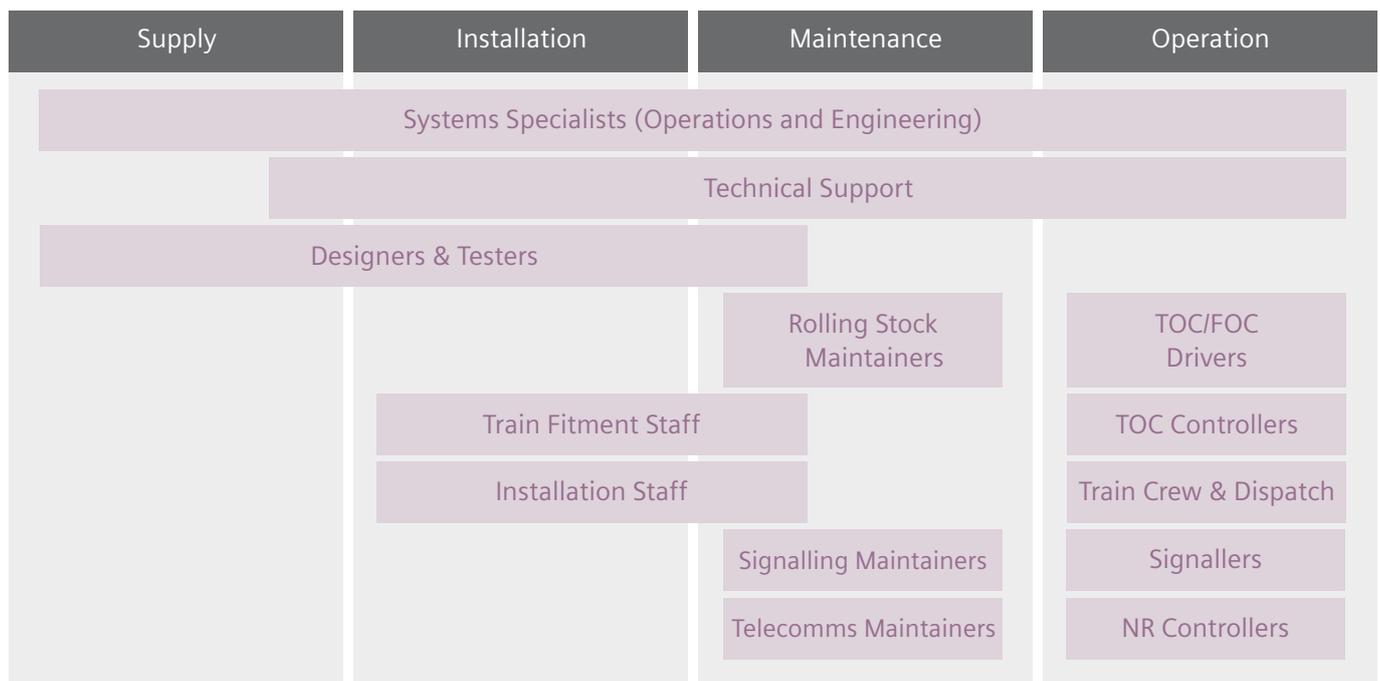>
> Mark Carne,
> CEO, Network Rail

Introduction

The gathering pace of the move toward the 'Digital Railway', including the European Rail Traffic Management System (ERTMS) and advanced train control systems, represents what Network Rail's CEO Mark Carne has called "the biggest change in the railway in many generations." ERTMS will transform Britain's railways at considerable scale and with total reach across the network; delivered through an extended programme that will demand wide-ranging training provision to meet these needs – from general appreciation to in depth design and systems engineering courses.

Thirteen 'job families' have been identified across a working population of some 55,000 people who will require significant training to do their jobs, whilst many thousands more will need a general appreciation of the new technologies and how they work. The diagram below shows the thirteen job families in more detail.

To respond to this demand, NTAR, drawing on advice of industry representatives, has identified key learning requirements associated with the different types of job roles. From this we have developed the following courses, which will be delivered by experts in their field, to support the essential needs of the industry as the ERTMS programme is deployed:

- Basic Introduction to ERTMS
- Introduction to ERTMS
- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch
- Introduction to ERTMS On-board Systems
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

Supply	Installation	Maintenance	Operation
Systems Specialists (Operations and Engineering)			
Technical Support			
Designers & Testers			
		Rolling Stock Maintainers	TOC/FOC Drivers
	Train Fitment Staff		TOC Controllers
	Installation Staff		Train Crew & Dispatch
		Signalling Maintainers	Signallers
		Telecomms Maintainers	NR Controllers

The Digital Railway

Basic Introduction to ERTMS

Qualification
The course is assessed by an on-line knowledge assessment. NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton or In-house

Duration
Half Day

Delivery Channel
Face to face

Maximum Attendees
8

Candidate Profile
This course is applicable to anyone working on the railway that requires an appreciation of ERTMS.

Learning Objective/Course Overview
The use of high technology computer based control systems is currently being deployed throughout the UK and indeed the world, to control safe train movements, and allow additional capacity of the rail infrastructure to be explored by rail operators. These new systems require a step change for all involved in rail operation and maintenance of both on-board and track side systems.

This introductory level course provides an overview of the European Rail Traffic Management System (ERTMS) and the current plans for implementing it across the UK railway. It is designed as an introduction for those with little or no prior knowledge of ERTMS, and takes the delegate on a fast paced journey from the ERTMS concept to the reality that is today modern digital train control.

Key Outcomes
On successful completion of the course the delegate will be able to:
- Understand the concept, history and impact of ERTMS on the UK railway
- Describe the purpose of the ERTMS system
- Outline the different levels of application of ERTMS
- Explain the key components of the system: trackside, on-board and control centre
- Outline the benefits and challenges of ERTMS operating in different modes
- Understand who is responsible for and who is doing what in relation to the introduction of ERTMS across the UK Railway

Requirements
No prior knowledge or experience of ETCS/ERTMS is assumed or required.

Other courses you may be interested in:
- Introduction to ERTMS
- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch
- Introduction to ERTMS On-board Systems
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

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The Digital Railway

Introduction to ERTMS

Qualification
The course is assessed by both knowledge and practical assessment. NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton or In-house

Duration
1 Day

Delivery Channel
Face to face

Maximum Attendees
8

Candidate Profile
This course is applicable to all individuals working on the UK Railway. It is particularly relevant to those who have to manage people, projects and assets and those who have interfaces with different job roles to their own or different stakeholders in their day to day role.

Learning Objective/Course Overview
European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

The course provides a broad introduction to the European Rail Traffic Management System (ERTMS) for any person working or managing on the railway including an appreciation of the impact of the technology across the different stakeholders.

Key Outcomes
On successful completion of the course the delegate will be able to:

- Understand the concept, history and impact of ERTMS on the UK railway
- Describe the purpose of the ERTMS system
- Outline the different levels of application of ERTMS
- Explain the key components of the system: trackside, on-board and external
- Outline the benefits and challenges of ERTMS operating in different modes
- Understand the concept of degraded working and the implications for operation of rolling stock
- Explain the process of rollout of ERTMS on UK railway including the issues surrounding interoperability
- Identify the key stakeholders and explain the impact of ERTMS on different organisations including TOCs/FOCs operation, infrastructure and rolling stock management and maintainers
- Understand how ERTMS has already been applied both in UK and in Europe.

Requirements
No prior knowledge or experience of ETCS/ERTMS is assumed or required.

Other courses you may be interested in:
- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch
- Introduction to ERTMS On-board Systems
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

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ERTMS for Train Controllers

Qualification
The course is assessed by both knowledge and practical assessment. NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton

Duration
2 Days

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
This course is applicable to those people with responsibility for managing train movements in TOCs and FOCs.

Learning Objective/Course Overview
European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

This first level course provides a detailed introduction to ERTMS, with particular emphasis on train control and movement authority.

Key Outcomes
On successful completion of the course the delegate will be able to:
- Understand the concept, history and impact of ERTMS on the UK railway
- Describe the purpose of the ERTMS system
- Explain the different levels of application of ERTMS
- Explain the benefits and challenges/impacts of ERTMS operating in different modes
- Understand the process for train awakening, preparation and data entry
- Locate and identify the on-board ERTMS equipment
- Explain what is meant by 'degraded working' and its implications for train movements
- Understand the data communication involved in ERTMS
- Understand the implications of actions/inactions
- Understand the changes to regulations and apply the local rules and procedures
- Have an appreciation of data interrogation and fault finding diagnostics processes and understand the implications of this information
- Understand the ERTMS rollout plan, which trains are fitted with ETCS, which routes are operational and where trains can and can't go and the process for ensuring this information is kept current

Requirements
Have attended the Introduction to ERTMS module and/or previous experience in a Train Controller or similar role.

Other courses you may be interested in:
- ERTMS for Train Crew and Dispatch
- Introduction to ERTMS On-board Systems
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

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The Digital Railway

Introduction to ERTMS for Train Crew and Dispatch

Qualification
The course is assessed by both knowledge and practical assessment. NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview

European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

This first level course provides a detailed introduction to ERTMS, with particular emphasis for people working as members of train crew or in train dispatch roles within TOC or FOC companies.

Key Outcomes

On successful completion of the course the delegate will:

- Have an appreciation of the concept, history and impact of ERTMS on the UK railway
- Be able to describe the purpose of the ERTMS system
- Be able to outline the different levels of application of ERTMS
- Be able to outline the benefits of ERTMS operating in different modes
- Be able to identify the key components of the ERTMS architecture and briefly explain their functions
- Be able to identify and explain the function of relevant aspects of station infrastructure
- Be able to explain what is meant by 'degraded working' and its implications for train movements
- Understand the process of data communication
- Understand and be able to apply relevant changes to policies and protocols
- Be able to apply the local rules, regulations and procedures in relation to train dispatch (as required by specific TOCs where a course is TOC specific)

Requirements

Have attended the Introduction to ERTMS module and/or previous experience in a Train Crew/Dispatch role or similar.

Location
Northampton

Duration
1 Day

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
This course is applicable to:

- Train drivers and driver instructors/trainers
- Train managers and on-board crew
- Train dispatch crew

Other courses you may be interested in:

- ERTMS for Train Controllers
- Introduction to ERTMS On-board Systems
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

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Introduction to ERTMS On-board Systems

Qualification
The course is assessed by an on-line knowledge assessment. NTAR bespoke qualification in Advanced Digital Technology.

Location
Northampton

Duration
Half Day

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
This course is applicable to:
- Designers (by way of background only)
- Installers
- Rolling stock maintainers
- Train drivers

Learning Objective/Course Overview
European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

This introductory level course to European Train Control System (ETCS)/ERTMS, is particularly suited as an introduction to the on-board systems for drivers, installation and maintenance staff and project managers.

Key Outcomes
On successful completion of the course the delegate will be able to:
- Understand the function of ETCS equipment within the broader ERTMS architecture
- Identify on-board ETCS equipment and what is required for different levels of ETCS application
- Outline the principles for the installation, testing and maintenance of on-board ETCS equipment including interoperability with trackside equipment
- Explain the function of on-board ETCS equipment including interfaces with the vehicle and with GSM-R equipment
- Understand the impact of ETCS on new processes and procedures

Requirements
Have attended the Introduction to ERTMS module and/or have a basic understanding of the European Rail Traffic Management System (ERTMS) and its application to the UK railway.

Other courses you may be interested in:
- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch
- Introduction to Maintenance of On-board ERTMS Systems
- Advanced Maintenance of On-board ERTMS Systems

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Introduction to Maintenance of ERTMS On-board Systems

Qualification
The course is assessed by both knowledge and practical assessment. NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview

European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

This first level course provides a detailed introduction to ERTMS, with particular emphasis on first line preventative and corrective maintenance techniques required for European Train Control System (ETCS) and ERTMS on-board systems.

Key Outcomes

On successful completion of the course the delegate will be able to:

- Identify and describe the function of the various components of ETCS on-board equipment
- Understand specific requirements in relation to installation and maintenance of on-board ETCS equipment e.g. safety regulations
- Understand and follow vehicle maintenance instructions (VMIs) re ETCS equipment and systems
- Access and download information from the on-board systems
- Explain the periodical maintenance requirements and know which tools are used
- Understand the principles of fault finding on ETCS equipment
- Perform post maintenance systems start up procedures and tests

Requirements

The course assumes that delegates have:

- Attended the Introduction to ERTMS module or equivalent
- A basic knowledge of railway signalling principles
- A working knowledge of computer software packages for rail vehicle maintenance and diagnostics
- Prior knowledge and experience of removing and exchanging electronic/electrical equipment on rolling stock

Location
Northampton

Duration
1 Day

Delivery Channel
Face to face

Maximum Attendees
12

Candidate Profile
This course is applicable to rolling stock maintenance personnel and anyone with responsibility for rolling stock maintenance.

Other courses you may be interested in:

- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch
- Introduction to ERTMS On-board Systems
- Advanced Maintenance of On-board ERTMS Systems

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Advanced Maintenance of ERTMS On-board Systems

Qualification
The course is assessed by both knowledge and practical assessment.
NTAR bespoke qualification in Advanced Digital Technology.

Learning Objective/Course Overview

European Rail Traffic Management System (ERTMS) is currently being installed as the first choice of futuristic train control throughout several high profile projects within the UK. The use of this sophisticated modern technology changes the methods of working on the rail network, as in some cases line-side signals will no longer be used. This impacts all involved in operating and maintaining the railway and the rail vehicles that the control system affords safe passage to.

This second level course provides more detailed skills and knowledge to carry out maintenance on European Train Control System (ETCS) on-board equipment. The course is not equipment specific to a single manufacturer as it covers the principles required to maintain ETCS equipment.

However should particular a manufacturer's equipment be required, then we have the flexibility to adapt the training as required, if suitable access to appropriate specific systems can be made available by the client organisation.

Key Outcomes

On successful completion of the course the delegate will be able to:

- Identify and describe the function of the various components of ETCS on-board equipment
- Understand any specific requirements in relation to installation and maintenance of on-board ETCS equipment e.g. safety regulations
- Access and download information from the on-board systems
- Download and configure software on different on-board units
- Use and interpret ETCS drawings
- Explain the periodical maintenance requirements, select correct tools for various tasks
- Understand the principles of fault finding on ETCS equipment
- Carry our practical fault tracing and corrective maintenance
- Identify and correct errors and failures on the on-board system
- Perform post maintenance systems start up procedure and tests
- Undertake preventive maintenance on on-board equipment
- Calibrate the Balise Transmission Unit
- Safely remove ETCS on-board systems and correctly replace

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Requirements

The course assumes that delegates have:

- attended the Introduction to ERTMS module or equivalent
- a basic knowledge of railway signalling principles
- a working knowledge of computer software packages for rail vehicle maintenance and diagnostics
- prior knowledge and experience of removing and exchanging electronic/electrical equipment on rolling stock

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"I'm a passionate believer in the opportunity we have to lay out the blueprint for a technological transformation of rail in this country; a railway where in just 15 years or so we could lead the world in digital train control, delivering more capacity, reliability, speed and safety all at lower cost and with a smaller environmental footprint."

Mark Carne, CEO, Network Rail
George Bradshaw Address (February 2015)

Location
Northampton

Duration
5 Days

Delivery Channel
Face to face

Maximum Attendees
8

Candidate Profile
This course is applicable to:

- Rolling stock maintainers and technicians

Other courses you may be interested in:

- ERTMS for Train Controllers
- ERTMS for Train Crew and Dispatch

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Contact us

We welcome all enquiries.

If you are a business or individual interested in finding out more about NTAR, and the courses and services that we offer, please do not hesitate to contact us at our state-of-the-art facility in Northampton.

We would also be keen to hear from you if you are a training provider or supplier interested in working with NTAR, to further support our curriculum.

We can be contacted through the enquiry form on our website, by email or by calling us on:

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