Abbott Risk Consulting Ltd

Rail Consultancy

Managing Risk
Improving Performance
About Abbott Risk Consulting (ARC)

Abbott Risk Consulting (ARC) has established a strong international reputation for safety, engineering and risk management both at home and around the world.

The company was established in 2002 and has quickly grown to become a successful consultancy with a loyal customer base. Today we have an extensive pool of highly qualified and experienced safety engineering and risk management consultants, supporting clients in both the private and public sectors in the transportation, nuclear power, defence, oil and gas, and renewable industries. We are committed to expanding our knowledge and our skills base through continuous professional development and alliances with other industry experts.

Our growth has been made possible by the enthusiasm of our people, their flexibility and commitment to delivering quality solutions to time and budget. Our clients recognise these qualities and many have established long-term framework agreements with us.
High Quality Technical Resource

- We value practical experience and a number of our consultants are drawn from operational roles in high hazard industries.

- Most of our consultants have first degrees in engineering or the sciences and a number have further degrees such as an MSc, PhD or MBA.

- Many are registered with the UK Engineering Council as Chartered Engineers.

- Most are Members or Fellows of various professional institutes.

- Our staff development is through funded training programmes, including post-graduate degrees, and through working on a wide range of interesting and challenging projects.

- We maintain close links with academic and professional institutions to ensure continued development.

- We are accustomed to the demands of working internationally, embracing different cultures and working with different nationalities.

- We are proud of our high staff retention rate which is normally around 90%.
Skills and Capability

Project Safety

Planning
• Project safety strategy and planning
• Engineering safety management processes
• Software assurance
• Verification and validation strategy

Legislation and Standards
• Developing approvals strategies for
  − European Directives and UK Regulations
  − Product acceptance
  − Cross acceptance
• Compliance with current regulations and standards
  − CSM on risk assessment and evaluation
  − CENELEC 5012X standards

Safety Engineering
• Hazard identification and assessment using
  − HAZID, HAZOP, FME(C)A
  − Fault and event tree analysis
• Safety Integrity Levels (SIL) determination
• Quantitative Risk Assessment
  − Cost Benefit Analysis (CBA)
  − ALARP demonstration
• Safety justifications and safety case development
• Integration with reliability, availability and maintainability (RAM) studies

Assurance and Verification
• Independent audit, review and assessment
• Design review
• Expert Witness

Safety Performance

Safety Management
• Safety management system development and improvement
• Best practice and regulatory requirements advice
• Hazard Log management
• Safety issues management
• Change management and assurance
• Safety and risk targets definition and benchmarking

Process assurance
• Process review and audit
• Safety culture assessment
Business performance

Risk Management
- Enterprise Risk Management (ERM) systems development
- Risk register development and maintenance
- Risk management process review
- Risk Management Maturity Model (RM³) assessment

Performance Improvement
- Safety and operational Key Performance Indicators (KPI) development
- Management system, process and procedure review, development and improvement
- Performance management, reporting and improvement
- Issue management and action tracking
- Organisational design and business change

Specialist Services

Human Factors
- Human Factors management and integration
- Equipment, control centre and workstation interface design
- Human error identification and risk reduction
- Human reliability analysis
- Workload assessment and job design
- Procedure design and assessment
- Training needs analysis
- Training design and evaluation

Engineering Support
- EMC/EMI studies
- Passenger flow modelling
- Fire consequence modelling
- Explosion modelling

Abbott Risk Consulting > Rail Consultancy

Photo courtesy of Docklands Light Railway Ltd
Managing Risk, Improving Performance
Docklands Light Railway Limited (DLRL)

In the build up to the London 2012 Olympics and their busiest period ever, ARC worked alongside DLRL on a series of initiatives for improving their management of the safety, risk and operational performance of the DLR network.

Docklands Light Railway (DLR) is London’s innovative, driverless railway, serving parts of East and South East London. The DLR was pivotal during the London Olympics and Paralympics, connecting key event venues, including the Olympic Park, ExCeL, Greenwich Park and Royal Artillery Barracks. During the Olympics, 7.2 million passengers used the DLR, double the normal levels.

“We have worked closely with DLRL to deliver some innovative and novel solutions for managing and improving their safety and operational performance. It has been very rewarding to see our work in daily use in DLRL and making a real contribution to their business.”

Steven Hughes, Director
Abbott Risk Consulting Ltd

Some of the projects that ARC worked with DLRL on include:

- Developing and maintaining an Enterprise Risk Management (ERM) system for capturing, assessing and managing all types of risk to the DLR, particularly Olympic-related ones
- Developing a framework and mechanisms for monthly reporting across DLR, including the Emirates Air Line, the new cable car across the Thames
- Implementing a novel Safety Performance Index for assessing the effectiveness of safety management through a combination of leading and lagging performance indicators
- Implementing a KPI dashboard to track DLR’s performance against their operational goals for the Olympics
- Reviewing the maturity of the DLR safety risk management processes against the ORR Risk Management Maturity Model (RM³). This was the first RM³ assessment not carried out by the ORR in the UK
A new railway for the United Arab Emirates

Etihad Rail

ARC was appointed with US partner Good Harbor Consulting (GHC) to assist Etihad Rail in developing an integrated Safety and Security Management System (SSMS) and to provide safety, security and risk services in support of the first phase of a planned 1,500 km network of integrated railway across the UAE.

The Etihad Rail project includes the construction of a freight and passenger rail network within the UAE which will form part of a crucial hub in the proposed Gulf rail network linking the six Gulf Cooperation Council countries - UAE, Qatar, Saudi Arabia, Bahrain, Kuwait and Oman.

The first stage of the project is the construction of the Shah Habshan Ruwais (SHR) Line which will transport granulated sulphur from the Gas Wells at Shah and Habshan to the Port at Ruwais using American heavy freight trains.

“Good Harbor Consulting LLC/Abbott Risk Consulting Ltd assisted us in ensuring that our approach to Safety and Security is to an extremely high standard and meets best practice benchmarks when compared to any railway in the world.”

Richard Bowker, CEO
Etihad Rail

ARC has been working with GHC, drawing on our experience of good practice worldwide, to:

- Establish a regulatory framework for the safety of the railway
- Develop an integrated safety and security management system for Etihad Rail
- Prepare a safety case for the preliminary design of the SHR Line

Some of the unusual issues faced by the project include integrating US and Chinese designs with European technology, crossing major pipelines, and protecting racing camels which can be worth up to $13 million.
A new Common Safety Method (CSM) for Europe

The CSM for risk evaluation and assessment sets out the framework for how risks from significant changes to a railway operation are to be assessed and managed.

The CSM is an EU Regulation and is mandatory for all mainline railways. It provides a consistent approach for assessing the safety implications of a change, and demonstrating that safety requirements are met and safety targets are achieved. Compliance with the CSM supports the cross-acceptance of risk assessments across the EU, so a risk assessment will not need to be repeated in different countries.

The principles of the CSM will be familiar to people who use EN 51026 and the “Yellow Book” for traditional rail engineering projects. However, the scope of the CSM is slightly wider as it also applies to changes to operating and maintenance processes, and to organisational changes where there is a safety implication.

**ARC’s experience of using the CSM includes:**

- Development of training material for the European Railway Agency
- Bid support on a range of projects ensuring compliance with the CSM for a major railway systems supplier
- Reviewing and updating DLR processes to ensure compliance with the CSM
- Provision of training on the CSM and other railway regulations for a train operator

Overview of the CSM process
Other typical projects

**Bid support**
Supported a number of major signalling bids, working closely with the client as part of the bid team. Our support included developing safety assurance plans, approvals strategies, RAM plans and costing the proposed scope of the work.

**Axle Counter Risk Assessment**
Formal review of the safety risks associated with a potential wrong side failure of axle counters following a manufacturing error. The review identified the potential accident scenarios, and assessed the operational safety risk.

**System Safety Support**
Supported the Safety and Railway Authority in reviewing, advising and accepting project safety and RAM deliverables in accordance with the CENELEC EN5012x standards. This included developing procedures to adequately undertake the role of safety authority in accordance with their accreditation, and the development of safety targets and a safety risk profile for the Rio Tinto railway in the Pilbarra.

Passenger flow modelling to identify areas of congestion on a station
Safety assurance culture review
Assessed the engineering safety culture of a major railway supplier. This involved interviewing staff throughout the organisation and a review of the company procedures and processes. The review identified strengths and weaknesses in the current culture, organisation structure and management system, and recommended actions to improve these.

Safety assurance process improvement
A major railway systems supplier engaged ARC to review its safety assurance processes as these were not being applied consistently and each project had its own “house style”. ARC developed a framework for the safety and system assurance processes, drawing on current project practices, the requirements of CENELEC EN5012x standards and good practice. The framework set out the key processes and how they fitted together, defined the key inputs, outputs, roles and responsibilities for each process, and developing common formal procedures to document the processes and activities.

Safety Risk Model update
Reviewed and updated an existing fault-tree based safety risk model for the DLR to reflect the current operation of the network, the safety accident and incident data, and good practice in modelling. A suite of reporting tools was also developed to take the results from the model and to generate the overall risk profile for the railway and the control measures in place.
**Expert Witness**

In a dispute over the Safety Integrity Level (SIL) required for key software systems for a new train, ARC provided expert witness testimony during the arbitration process as to whether the SIL assigned to the software was appropriate to satisfy the engineering and operational safety requirements for the new train.

**Review of the engineering assurance and commissioning processes associated with major rail projects**

Major rail projects were being delivered late, over budget and with major issues delaying the acceptance of the works into service. ARC carried out a high-level independent review of the engineering assurance and commissioning processes associated with these projects and compared these with good practice found in railways and high hazard industries around the world.

The recommendations from the review provided a roadmap to how the delivery, assurance, commissioning and acceptance of major projects should be restructured.
Proven capability

ARC has wide experience of working in high hazard and highly regulated industries; including railway, onshore and offshore oil and gas, petrochemical, civil nuclear, defence, renewable energy and marine sectors.

We are accustomed to the demands of working within various UK, European and international regulatory regimes and helping our clients comply with new, changing and complex requirements.

Our rail clients include railway agencies, infrastructure managers, train operators and suppliers, such as:

**UK**
- Transport for Scotland
- Network Rail
- First ScotRail
- Docklands Light Railway
- Tube Lines
- Highlands & Islands Enterprise
- Thales Rail Signalling Solutions
- Invensys Rail
- Hitachi Rail
- Siemens

**Europe and Middle East**
- European Rail Agency
- Etihad Rail, Abu Dhabi
- Turkish State Railways

**Australia**
- Transport for New South Wales
- RailCorp
- Downer EDI Rail
- Scott Wilson Railways

Accreditations and Registrations

- Certified compliant with ISO 9001
- Affiliate member
- Registered supplier to the rail industry
- Approved vendor to TfL
- Registered consultancy
What our clients say

“My review indicates this is money well spent. No revisions required. An excellent job.”
Safety Manager
Rolling Stock Client

“ARC should be proud of the report delivered, especially considering the varying scope and limited time allowed. This is without a doubt, the best value for money project I have ever worked on.”
Project Manager
Government Agency Client

“Overall, service has been excellent. Mainly deal with Steven Hughes, who has been flexible, helpful, and always on the end of the phone. We have a good working relationship, and it is a pleasure to have Steven around.”
Systems Manager
UK Light Rail Client

“ARC delivered an excellent Safety Management and Risk Assessment Training course tailored to our requirements and delivered it in an engaging, informative and interesting way.”
Engineering Director
UK Rail Client
ARC is proud to be recognised as one of the Sunday Times 100 Best Small Companies to Work For. In all six years ARC has participated in the scheme we have achieved a top 100 placing. We were the highest placed engineering consultancy and achieved the top “3 star” accreditation in 2012, 2013 and 2014.

“This is all about our people. They make this a great place to work and I never cease to be impressed by their talent and dedication. They are all prepared to go that extra mile to ensure our clients are satisfied and this is reflected in high levels of repeat business. We have always known that we have created a good environment for people to develop and work and it’s great to have this recognition.”

John Abbott
Managing Director
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