

DEVELOPING ADVANCED ACCIDENT INVESTIGATION SKILLS FOR OPERATING IN CAPACITY CONSTRAINED GB RAILWAY

Clifton, Colin

MA, CMIOSH

Southeastern Railway

Watson, Stephen

CEng, CSci, FICChemE, BEng

Arthur D. Little

John Barker

BSc (Hons), MSc, PhD

Arthur D. Little



SUMMARY

Southeastern is a passenger train operator, providing services on lines in the South-East of England, into some of the busiest stations in London on both high speed and conventional services on some of the most congested parts of the rail system in Europe.

Since 2011 Southeastern has been actively developing the competence of its managers to undertake effective investigations. In late 2014, Southeastern identified several opportunities to make a further step-change in its investigation and learning processes. Having created a pool of investigators operating across the organisation, there was an opportunity to create a group of more skilled investigators able to handle the challenges of more serious incidents.

Southeastern worked with Arthur D. Little to develop a bespoke training course to equip selected investigators with the skills to tackle more complex investigations, possibly in the media spotlight, and to set the remit for and manage a wide range of investigations being undertaken by existing managers. In March 2015 two groups of selected Southeastern managers went through this new two day course.

This conference paper presents details Southeastern's training needs and on how the advanced accident and incident investigation course met these needs.

INTRODUCTION

Southeastern operate passenger train services across much of the South-East of England into a number of the principal stations in London, including Charing Cross, London Bridge and St Pancras International, on both high speed and conventional services. Southeastern is committed to delivering excellent passenger service and at the same time providing a safe environment for passengers, staff and all affected by their operations. Learning from incidents and accidents has always been important, but is especially so when combined with a capacity constrained network and annual passenger growth of around 7%.

Southeastern's focus on the development of the accident investigation competence of its line and functional managers began in 2011. Following this, in late 2014, Southeastern identified several opportunities to make a further step-change in its investigation and learning processes. One such opportunity was to create a small group of more skilled investigators able to handle the challenges of more serious incidents. The other opportunity was to use the knowledge and experience of these more skilled investigators to set the terms of reference (remit) of investigations and to enhance coaching and mentoring of the wider pool of investigators as they undertake investigations and write reports.

Southeastern commissioned Arthur D. Little to develop the training given Arthur D. Little's proven track record on delivery of training courses for safety management, safety leadership, risk assessment skills, and accident investigations for a number of high hazard sectors, such as transport, construction and oil and gas. In particular, Arthur D. Little has delivered the Strategic Safety Management Programme (SSMP) to the UK rail industry for more than 15 years and has significant experience in linking safety management to strategic and business needs. The wide range of industries served by Arthur D. Little, such as oil and gas processing, pipelines, construction, shipping of hazardous materials, highways and nuclear power, helps keep them at the leading edge of safety and risk management.

NOTATION

IRSC: International Railway Safety Council

ADL: Arthur D. Little

MTR: MTR Corporation

GB: Great Britain

BACKGROUND

The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) were introduced to implement the requirements of the 2004 European Railway Safety Directive in Great Britain. ROGS strengthened the legal requirement for accident and incident investigation, requiring those responsible for managing safety on the railway to have the appropriate systems in place to carry out thorough investigations and identify the causes of accidents and near misses.

GB's safety regulator - the Office of Rail and Road (ORR) – currently requires infrastructure managers (including Network Rail) and railway undertakings (passenger and freight) operating on the GB mainline network to comply with Railway Group Standards (RGS). An RGS is a standard that defines what must be done to achieve technical compatibility on the GB mainline network. Requirements for accident and incident investigation are set out within RGS GO/RT3199 [1]. These requirements are in addition to the legal, moral and monetary reasons for investigating accidents to prevent them from reoccurring. Whilst prescriptive about the required interfaces between railway entities, GO/RT3119 does not go into significant detail on the requirements of incident training, leaving this instead to each Railway Undertaking to define as part of their own Safety Management System.

Since 2011 Southeastern has been actively developing the competence of its line and functional managers to undertake more effective accident and incident investigations. As part of this process, some 150 managers have now attended a two-day training course delivered by Arthur D. Little, followed by additional coaching and mentoring undertaken by specialists within Southeastern.

Southeastern has noted that this process has significantly improved the quality of investigations undertaken and has enabled Southeastern to accelerate their learning from incidents. One measure of success is that the total annual financial cost of both passenger and staff accident claims over this period has fallen despite increasing passenger numbers.

Having created a pool of investigators operating across the organisation, creating a small group of more skilled investigators able to handle the challenges of more serious incidents was seen as useful step in further enhancing the investigative skills of Southeastern as a whole. These more serious incidents often generate media interest, both locally and nationally, and involve multiple organisations and potentially significant levels of complexity. Additional opportunities to use the knowledge and experience of these more skilled investigators to set the terms of reference (remit) of investigations (rather than relying on one of two senior managers) and to provide enhanced coaching and mentoring of the wider pool of investigators as they undertake these investigations and write their reports were also identified.

Course specification

Southeastern needed a training course that would equip a number of selected investigators with the skills to tackle more complex investigations, possibly in the media spotlight, and to set the remit for and manage a wide range of investigations being undertaken by the existing line and functional managers. The course also needed to provide the senior managers and key safety managers attending the course with the skills and knowledge to be able to effectively review investigation reports as well as lead investigations into the most serious incidents.

Southeastern requested that ADL develop and deliver a bespoke two day training course to two groups of Southeastern managers, drawing on ADL's extensive past experience in both conducting accident investigations and training others in accident investigation techniques.

COURSE PROGRAMME

ADL agreed the main elements to be covered (and the approximate amount of time to be dedicated to each element) on the training course with Southeastern. These high level areas were then refined into the seven main sections of the course:

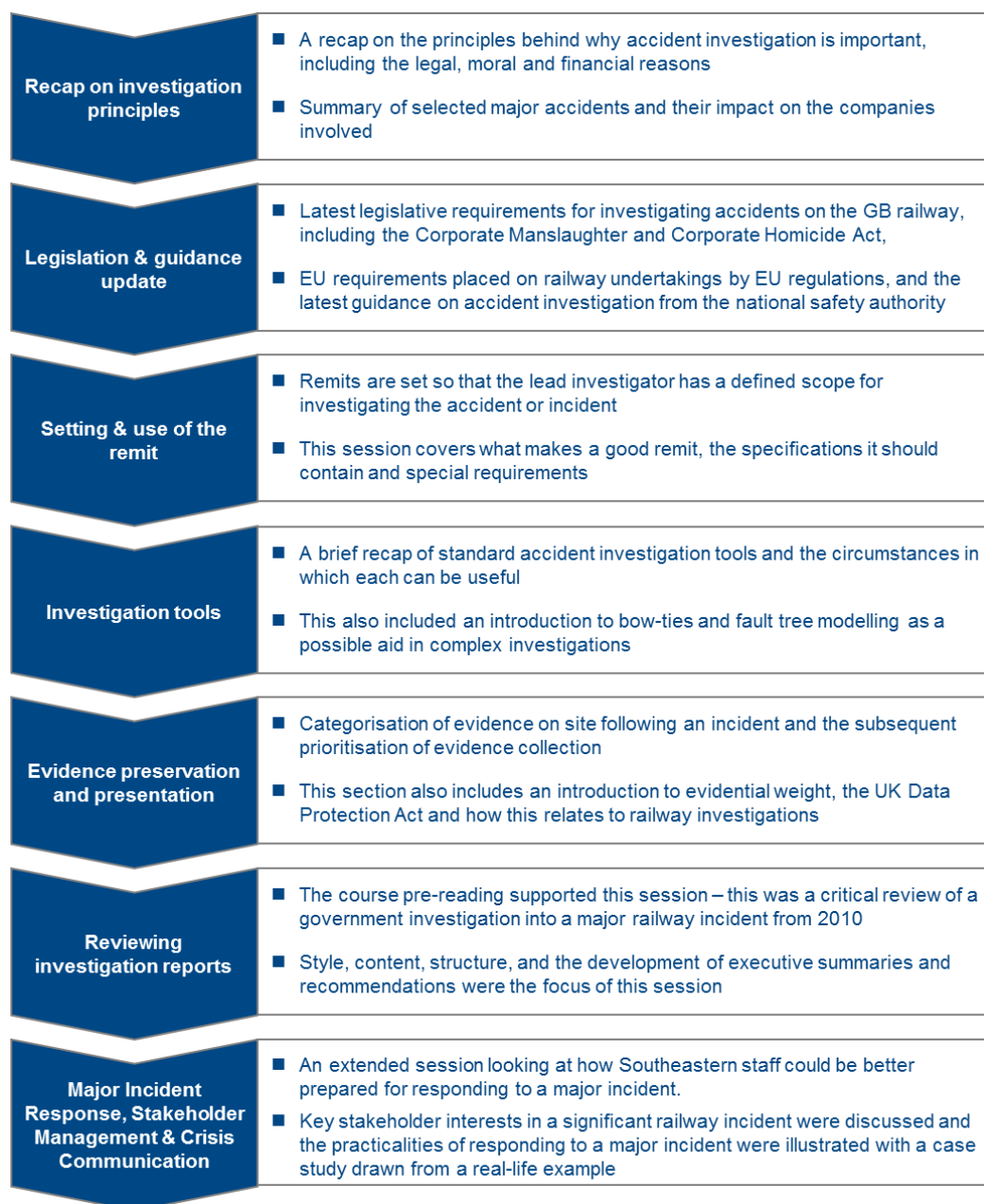


Figure 1: Course structure summary

COURSE FEATURES

The style and method of course delivery shared similarities with that previously and successfully delivered to Southeastern.

Taught course versus interactive discussion

All the sessions are designed to be interactive. Delegates are asked many open style questions, for example, 'what problems do you normally see when reviewing investigation reports? How could these be avoided?'. These questions generate discussions between the delegates from different business functions within Southeastern, enabling knowledge sharing, and sparking new ideas and practical advice in how to enhance accident investigations. Examples include activities from delegates own investigations that can be used to help others within Southeastern in conducting their own investigations.

The need for effective accident and incident investigation is driven by human, economic and legal considerations

Note the conspicuous company logos in media pictures of lorry accidents

The potential consequence of the undesired event is selected by answering the question: What is the credible worst outcome?

Consequence	Negligible	Low	Medium	Major
Injury	No actual or potential for injury	Minor injuries (e.g. sprains)	Major injuries (e.g. broken limbs)	Major injuries (e.g. broken limbs)
Damage (including financial loss)	No damage, no real financial loss other than reporting and recording the event	Minor damage (e.g. £10k)	Major damage (e.g. £100k - £250k)	Significant damage: loss > £250k
Reputation	Issue is resolved quickly, no significant media coverage	Minor stakeholder concerns, local media coverage	Major stakeholder concerns, major endorsement for the company, national or international media coverage	Significant adverse on the reputation of the company, nationally or internationally
	Issue is resolved quickly, no significant media coverage	Possible breach of legislation, fines or claims < £50k	Possible breach of legislation, fines or claims < £50k	Breach of legislation, possible criminal convictions, fines or claims > £250k

The Haffield crash directly led to shareholder loss of confidence in Rail subsequent collapse

- Railtrack legislation
- The Cullen Inquiry into Ladbroke Grove led to the creation of the Rail Safety and Standards Board in 2003 and the Rail Accident Investigation Branch in 2005

procedures in place for resource allocation and response when RAIB attend

```

    graph TD
      A[Two inspectors attend the scene and contact other agencies on site] --> B[Establish ORR Silver & Bronze control]
      B --> C[ORR Silver and Bronze Control to liaise with ORR Gold Control to determine whether any additional resources are required]
      C --> D[ORR Gold Control to liaise with corporate services to provide additional resources identified]
      D --> E[Agree initial form of investigation]
  
```

In the event that RAIB do not attend the scene of a major incident then the response will be determined by ORR management – this would be an unusual occurrence

Figure 2: Sample slides from the advanced accident investigation course

Extensive use of case studies and exercises

The course was supported by a pre-reading document, case studies and exercises. The pre-reading document was an extract from the *Eurostar Independent Review* [2], an investigation conducted jointly by the UK and French governments into the failure of five Eurostar trains in the Channel Tunnel on 18 December 2009, leaving passengers stranded in the tunnel for many hours. This pre-reading formed the basis of the case studies for the Reviewing Investigation Reports and Major Incident Response sections of the course.

This example demonstrates how an operational incident can rapidly escalate into a crisis that threatened to cause permanent reputational damage to Eurostar. Group discussions, guided by the trainers, led to delegates' experiences in dealing with operational incidents being brought out and shared with the group and generated ideas on how Eurostar could have averted the escalation that followed the initial train failure. The discussion was supported by news clips and videos of interviews with railway experts to show the visual impact of the events.

Other briefing sessions in the course were supported by short exercises – a decision taken early in course development to ensure that a high degree of interaction is present throughout the course. Exercises were completed in small groups and followed up with a full group discussion. All exercises and case studies were supported by model answers.

Overall, the wealth of practical and real-life examples (including many from the trainers) are able to contextualise the theoretical concepts, thus bridging the gap between theory and practice, encouraging active learning and developing customised learning outcomes.

Guest speaker from the Rail Safety and Standards Board (RSSB)

An expert in train accidents from RSSB (a publicly funded organisation that facilitates the railway industry's work to achieve continuous improvement in the health and safety performance of the railways in GB) talked through the history of accident investigation. Historic and recent train accidents, illustrated with videos and simulations, were used to illustrate the progress made in railway safety over the last century and to emphasise the role that learning from accident investigations has played in many safety related developments.

Open-book assessment rather than closed book test

The assessment exercise was an open-ended exercise based on a real-life incident from the GB railway that was adapted for the needs of the training course. A deliberate decision was taken at the start of course development to not include a closed-book test and to focus the assessment exercise on being a test of more general accident investigation skills.

The exercise tested delegates' ability to apply the techniques from the course, particularly in the area of report reviewing and recommendation writing as this was one of the main focal points of the course

COURSE OUTCOME

At the end of each of the two courses the delegates were familiar with some of the more advanced techniques in accident investigation, had received an introduction to major incident response and crisis management and were better equipped for reviewing investigation reports written by others.

It is always difficult to directly quantify the benefits of a training programme. However, we believe that by putting managers through the customised training programme that the delegates will be able to use the learnt skills in their day jobs – this is supported by feedback from the course delegates:



Figure 3: Feedback quotes from course delegates

These quotes are supported by the quantitative feedback scores from the two courses – delegates were asked to rate each session of the course, the presenters, course materials and guest speaker on a 1 (poor) to 5 (very good) scale. The average score for the two courses was 4.5 out of 5, an excellent score for a new course. Southeastern concluded that the content, style and level of the course had been appropriate for the course delegates and the guest speaker slot was seen as a particularly interesting use of time.

CONCLUSION

ADL developed the Advanced Accident Investigation Skills course in conjunction with Southeastern to further develop the investigation skills of experienced investigators. The sessions on remit writing and reviewing investigation reports were particularly well received. The skills gained by delegates in remit writing will relieve some of the pressure on the two managers who, at the time, set the remits for all of Southeastern's accident investigations. The section of the course on reviewing investigation skills also conveyed a considerable amount of information that was applicable to delegates' wider jobs, beyond accident investigation.

The other sections of the course met the requirement to equip already experienced accident investigators within Southeastern with the skills to be able to handle more complex investigations, including those where media interest could play a factor.

REFERENCE

[1] *Railway Group Standard GO/RT119, Accident and Incident Investigation, Issue 3*, December 2012

[2] Eurostar Independent Review, February 2010