Arthur D Little

A review of railway safety and of the role and function of the Railway Safety Commission

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Executive Summary

Introduction

After decades of under investment, the Iarnród Éireann (IÉ) network is in a period of significant investment and growth. Following a strategic safety review of the network and operations in 1998, the Minister of Public Enterprise established a High Level Task Force to prepare prioritised recommendations to address the issues identified in the strategic safety review. A five-year Safety Programme for 1999-2003 was prepared which provided for approximately €660m of investment. This first five-year period of investment has now been completed with significant renewals of permanent way, structures, fencing, safety critical buildings and level crossings.

A second phase of investment has been prepared for 2004-2008; the "Railway Safety Programme 2004-2008" builds on the work done in the first five years, and aims to provide further significant safety benefits to a level that is As Low As Reasonably Practicable (ALARP). The Programme is projected to cost €512m and is divided into three main areas; Safety Management System (€30m), Infrastructure (€444m), and Human Performance (€38m).

Whilst the majority of the investment is for continued infrastructure upgrades and renewals, this second phase of the Programme increases the emphasis on the 'softer' aspects of managing safety – the processes, systems and culture.

The Railway Safety Act 2005 provides a new regulatory framework for railway safety which applies to all railways that are public carriers or otherwise interface with the public, including IÉ. Under the framework, the Railway Safety Commission have wide-ranging powers of inspection and enforcement, and are to provide a functionally independent Rail Incident Investigation Unit.

A key component of the new regulatory framework is that duty holders (including IÉ) must prepare a safety case for submission to the RSC. IÉ are in the process of preparing their safety case (at the time of this study) for submission in September 2006.

The Railway Safety Commission (the RSC) has commissioned this further independent safety review of IÉ's network and operations, the role and function of the Railway Safety Commission, and the oversight provided by the Department of Transport (DoT). The study makes recommendations for improvements in processes, management systems, organisation and resources to allow the railway to continue to operate safely now and in the future.

It is important to note that the findings, conclusions and recommendations provided in this report have been established, in part, by the opinions of those interviewed in each of the three organisations (RSC, DoT, IÉ). In particular, the review included a reporting on the status of 'softer' more cultural aspects, meaning that understanding the views and opinions of key staff, as well as a factual reporting on progress, was required.

The review was not a classic audit, rather a broader review of the process of regulatory oversight, and the progress on all aspects of safety management at IÉ. In interpreting the results, it is important to bear in mind that the review is a "snapshot" in time. It is recognised that in many areas where inadequacies are highlighted, IÉ is already aware of these.

Conclusions

Overall, we conclude that:

- With the exception of **one concern relating to apparent failures in consistently providing lookout protection, no risks have been identified which give rise to 'intolerable' risk** that require urgent remedial action
- As a result of the significant investment under the Railway Safety Programme, **safety issues relating directly to infrastructure and engineering assets have and are being addressed satisfactorily in line with good practices**
- Significant efforts have been put into **developing the 'softer side' of safety; management systems and culture.** Particular examples are some of the initiatives in Operations that appear to have made good progress in tackling key risk areas, (for example shunting, signalling and SPADs). Recent progress within the Monitoring Standards is also encouraging
- However, there remain some **significant issues that have not progressed as well or as quickly as might be expected**, which will require a concerted and continued effort if they are to be dealt with appropriately. Most of the issues are systems related:
  - Shortfalls in **compliance and commitment to the Company Standards** (which are mandatory and provide, with the Rule Book, the core of the Safety Management System)
  - **Lack of progress in developing new, and issuing final versions of, large numbers of technical standards**. The concern is that development, implementation and control of such a large number of standards is not realistic
- Another key area that needs to be addressed is **compliance with standards and rules** 'at the sharp end'. Despite the core of the management system being in place for several years, there remains a heavy reliance on local knowledge and years of experience that is held by IÉ staff. Effective implementation of a competence

management system will be critical to success (currently being developed under the Railway Safety Programme)

- **IÉ appear to have a decision-making process that is essentially robust**, primarily based around a complex hierarchical meeting structure, including the Safety Review Group, and regular meetings with the Chief Executive in which safety issues are discussed. The Network Risk Model has been useful in helping to underpin the investment within the Railway Safety Programme (RSP), and there are plans for further development. However, we have recommended below that IÉ should consider whether **simpler and more specific risk tools** would serve their needs more appropriately and cost effectively
- The RSC has had **significant difficulties in recruiting senior posts**, and will need to resolve this if it is to deliver its role effectively
- There is also a concern that **current staffing levels in the RSC may not provide for sufficient time 'on the ground'**, particularly in light of the plan to relocate the RSC out of Dublin. Now out of interim mode, the RSC need to ensure that it takes a more leading role, setting out clearly its expectations to IÉ
- **Progress on most projects** within the Railway Safety Programme **appears reasonable.** However, there is significant concern that **progress reporting** of projects in the areas of safety management and human performance **lacks rigour, and the project scope and objectives are not clearly defined in many cases**
- There are no railway professionals within DoT, and so reliance has been made on the RSC and external support. We have recommended below that a **senior railway professional** would increase technical understanding and provide greater scrutiny of investment on the railway

Recommendations

A total of 67 recommendations have been developed to address the identified shortfalls, ranked in terms of priority as follows:

- 1 urgent recommendation
- 26 high priority recommendations
- 32 medium priority recommendations
- 8 low priority recommendations

Overall, no significant financial investment will be required to deliver the recommendations. Most recommendations on IÉ could be contained within the budgets provided in the Railway Safety Programme.

The recommendations include the following key areas (urgent and high priorities are indicated):

- **Workplace safety:** urgently address apparent failures in providing lookout protection *(urgent)*; review, monitor and audit Track Safety Coordinator role *(high)*; strengthen safety briefings across all departments *(high)*; log first aid use
- **Process of regulatory oversight**:
  - **RSC:** fill senior vacancies in the RSC as soon as possible *(high)*; provide sufficient time for inspectors in the field and develop an infrastructure access protocol *(high)*; review implications of relocation of the RSC (high); RSC increase proactivity and set expectations to IÉ *(high)*; update and reissue Safety Case Guidelines *(high)*; field work to include focus on ground level compliance issues identified in this report *(high)*
- **DoT:** improve understanding of Network Risk Model; consider recruiting railway professional to provide greater capability for promoting railway safety, and for increasing scrutiny of railway investment projects
- **Railway Safety Programme management and delivery**: IÉ to review allocated budgets for projects in the Railway Safety Programme and for projects in progress, produce a clearly defined scope, timescale and resource requirement. The results should be reported to DoT and the RSC *(high)*; maintain progress on the Railway Safety Programme by carrying out more formal monthly reporting on progress *(high)*
- **Safety management and standards**: review and update Company Standards to ensure that they are fully implemented *(high)*; in the absence of Job Descriptions for some posts, clarify safety responsibilities for all safety related staff *(high)*; specify communication requirements for employment of contractors on railway sites *(high)*; review and monitor Method Statements guidance; implement the drug and alcohol policy *(high)*; improve briefing of standards across all departments
- **Infrastructure Department**: reconsider plans for large numbers of technical infrastructure standards *(high)*; complete and roll-out key standards in draft; commence programme of thorough inspections (structures) *(high)*; develop flood scour management system (structures) *(high)*; review and prepare for outside party works risks; develop formal fault system for signalling; implement inspection and maintenance records system (Signalling and Telecomms), provide safe access to Fairview sidings; introduce earthing equipment management system (Electrification); implement OCS Standards; looking ahead, develop formal processes to ensure safety relating to contractors and third parties (Electrification)
- **Mechanical Engineering Department**: review methodology for approvals *(high)*; develop process for safety related defect reporting; align safety management system of Mechanical Engineering with Company Standards; prepare for EU Directives;

develop training strategy; brief depot staff on local instructions for managing maintenance and safety instructions and drawing; clarify meeting structure and remits across department; formalise protocol for depot safety meetings and register attendance; review processes for managing change and brief staff of requirements

- **Operations Department**: address consequential vacancies *(high)*; review mobile phone usage; improve Safety Statements to make them locally specific; reassess number of trainers at Inchicore; secure training attendance
- **Other processes:**
  - **Decision-making and Network Risk Model**: review end requirements of Network Risk Model to prevent over complexity and focus on developing fit-for-purpose risk tools that can be used for day-to-day decisions *(high)*; develop in-house competence in risk model; review asset rating guidance system and application
  - **Monitoring:** continue to implement Monitoring Standard across all departments (particularly Infrastructure and Mechanical Engineering) *(high)*; workshop to review outputs of Monitoring
  - **Audit:** strengthen audit team and process including appointment of a lead auditor and development of an audit strategy *(high)*
  - **Accident investigation**: update the Accident Investigation Standard *(high)*; better define the future accident investigation process; provide training and coaching in investigation skills
- **Safety culture:** improve awareness of CARA; re-emphasise importance of near miss reporting

Many of the recommendations across all categories address the underlying causes of shortfalls in **safety culture**, such as:

- Implementation of the Monitoring Standard
- Strengthened audit
- Improved safety briefings

Most importantly, continued improvement of IÉ's safety culture will require **leadership and commitment from the most senior levels**, through the line. More generally, to strengthen safety culture, IÉ must become less tolerant of current routine violations of the rules or deviations from good practice. This highlights the importance of implementing highly effective monitoring, audit, safety briefings, and delivery of the competence management system which is a key part of the Railway Safety Programme.

Action plan

A six-step ‘action plan’ is proposed, which initially requires that the recommendations of the report are accepted by the RSC, DoT and IÉ.

1. Introduction

1.1 Background

Recent history of the railway

After a long period of under investment, the railway is now in a period of significant investment and growth. A five-year Railway Safety Programme was instigated following the Knockcroghery derailment in 1997. The then Minister for Public Enterprise commissioned a strategic safety review of the Iarnród Éireann (IÉ) network and operations to determine whether the risk posed to passengers, staff and the public were acceptable, and to highlight where action and investment was required to address shortfalls. This original study was completed by IRMS in 1998, and there have been a number of subsequent reviews to monitor progress and update recommendations.

Following the review, the Minister of Public Enterprise established a High Level Task Force to prepare prioritised recommendations to address the issues identified in the Strategic Safety Review. IÉ prepared a five-year Safety Programme for 1999-2003 that provided for approximately €660m of investment:

- Significant infrastructure renewals
- Improved standards and maintenance programmes
- Strengthened safety culture
- Use of risk assessment within an ALARP framework to assist with prioritising investment

This first five-year period of investment has now been completed with significant renewals of permanent way, structures, fencing, safety critical building and level crossings.

A second phase of investment has been prepared for 2004-2008. The "Railway Safety Programme 2004-2008" also takes into account a number of other studies that have been completed since the original Strategic Safety Review:

- Independent Review of Infrastructure, 1998 conducted by Arthur D. Little
- Safety Review of Level Crossings, 1999 conducted by Arthur D. Little
- The National Development Plan 2000-2006 which committed to the improvement of safety and network capacity and quality, providing €635m
- The Way Forward, 2001 commissioned by the Minister to examine concerns relating to industrial relations difficulties and the structure of the CIE group

- Agreed Programme for Government 2002 committing to a second five-year Safety Programme starting in 2004
- Strategic Rail Review 2003 conducted by Booz Allen Hamilton to provide a basis for establishing a strategic policy framework for future development of rail in Ireland

The "Railway Safety Programme 2004-2008" builds on the work done in the first five years, and aims to provide further significant safety benefits to a level that is As Low As Reasonably Practicable (ALARP). The Programme is projected to cost €512m and is divided into three main areas:

- Part A – Safety Management System (€30m)
- Part B – Infrastructure Programme (€444m)
- Part C – Human Performance Programme (€38m)

Whilst the majority of the investment is for continued infrastructure upgrades and renewals (Part B), this second phase of the Programme increases the emphasis on the 'softer' aspects of managing safety – the processes, systems and culture. Prioritisation of investment is again being underpinned by a safety risk model.

About the Railway Safety Commission and Iarnród Éireann

Railway Safety Commission: IRMS recommended, in its original report, that relevant railway safety regulatory legislation be reviewed and updated. In response Government published the Railway Safety Bill 2001 (RSB). The RSB adopts the concept of duty-holder responsibility for safety and provides for the introduction of a safety case framework incorporating new works approval procedures. The RSB passed into law in 2005 and became the Railway Safety Act 2005, and put in place a new regulatory framework for railway safety which applies to all railways to which the public have access, including the IÉ network, light rail, metro and heritage railways. It also provides for the establishment of the Railway Inspectorate as an independent agency, the Railway Safety Commission, with wide ranging powers of inspection and enforcement and incorporating a functionally independent Railway Incident Investigation Unit (RIIU).

Iarnród Éireann: IÉ is the primary duty holder responsible for controlling railway infrastructure and operations in the Republic of Ireland, and the owner and operator of most of the railway infrastructure and trains. IÉ is responsible for managing the design, installation, testing, maintenance and renewal of its physical assets such as track, structures, signalling, telecommunications, electrification, level crossings and rolling stock.

The IÉ network comprises some 2288 route kilometres covering main line, suburban, commuter and cross country services, as well as freight services which run on both mixed traffic lines and dedicated freight routes. In 2005, there were some 37.7 million passenger journeys and 1.7 billion passenger kilometres travelled. Iarnród Éireann employs over 5,500 personnel, approximately 3,800 with safety critical posts, and the remainder in safety related or support roles.

This study

The Railway Safety Commission (at the time of commencing the work – the Interim Railway Safety Commission, then a part of the DoT) commissioned this independent safety review of IÉ's operations and the role and function of the RSC.

1.2 Objectives and scope

The scope of the review focuses on the development of safety management systems, culture and implementation, but also considers the condition of infrastructure and rolling-stock assets and the effectiveness of the process of regulatory oversight.

The detailed scope of work includes:

- The adequacy of IÉ's safety policy, systems, rules and procedures (including the methods for the assessment of risk and the prioritisation of safety related expenditure i.e. the delivery, usage and funding of the IÉ safety risk model)
- The adequacy of IÉ's on the ground implementation of safety rules and procedures, considering safety culture and working relationships
- IÉ's development of Standards, implementation of Job Descriptions and Safety Responsibility Statements and its training, supervision, assessment and peer review processes
- IÉ's process for asset procurement
- In the context of delivering a safe railway, the Railway Safety Investment Programme including procedures for prioritising investment and as a vehicle for implementing the IRMS recommendations and any recommendations arising from the review
- The implementation of the proposed regulatory framework outlined in the RSB as amended, in a national, European Union and international context
- The process of regulatory oversight as currently employed by the IRSC

- Clear, precise, quantified and objective advice on whether the overall level of railway safety is adequate in particular:
  - Identify any matters, whether asset or safety management system based, which give rise to an intolerable risk and require urgent remedial action
  - Identify any matters, whether asset or safety management system based, which will give rise to an intolerable risk in the medium term (up to 5 years) and in the longer term (between 5 and 10 years) and require remedial action in that timeframe
  - Identify the principal options for addressing any urgent, medium and longer term intolerable risks
  - If necessary make strategic recommendations as to the form and structure of IÉ's Safety Management System and the programme for its development
  - Make recommendations as appropriate with a view to improving the effectiveness of the implementation of the Railway Safety Investment Programme and the the RSC's process of regulatory oversight

1.3 Study approach and methodology

An overview of the approach is provided in Figure 1 (details are provided in Appendix 1).

Figure 1: Overview of study approach

Source: Arthur D Little

In overview, the approach made best use of three main activities:

- A review of relevant **documentation** including previous reviews and audits, Iarnród Éireann standards and procedures, meeting minutes, and documentation specifically relating to the Network Risk Model and processes for investment planning

- **Interviews** with staff from the RSC, DoT and IÉ. The aim was threefold:
  - To confirm the level of understanding and usage of systems identified from the document review
  - To reconfirm or identify any new underlying causes of weaknesses in delivering effective safety management
  - To establish management's understanding of the key risks and the actions required to mitigate them

A series of focused **site inspections** conducted as an integral part of the interview programme. The primary aim here was not to conduct yet another independent review of asset condition, but to give an independent view on the adequacy of response to the previous recommendations, as well as looking for any new or emerging safety issues.

At an interim stage, a report of emerging issues was presented and discussed with all main parties (RSC, DoT and IÉ).

Following the document review, interviews and site inspections, the project team carried out a synthesis of the draft findings to establish key 'cause and effects' and developed recommendations to address these causes.

It is important to note that the findings, conclusions and recommendations provided in this report have been established in part by the opinions of those interviewed in each of the three organisations (RSC, DoT, IÉ). In particular, the review included a reporting on the status of 'softer' more cultural aspects, meaning that understanding the views and opinions of key staff, as well as a factual reporting on progress, was required.

1.4 Report structure

This report provides the detailed findings of the review, and is structured in the following sections:

- **1. Introduction:** this chapter, giving background to the study, objectives, scope and an outline of approach
- **2. Review of the process of regulatory oversight:** role and function of Railway Safety Commission, Department of Transport
- **3. Review of railway safety:** Iarnród Éireann safety management systems, infrastructure, operations, engineering and culture. In each section, recommendations are provided for addressing specific findings
- **4. Summary of recommendations and action plan:** summary of recommendations and suggested 'action plan'

- **Appendices:** containing supporting information

67 recommendations are made for addressing specific safety related findings. For each recommendation, the following is provided:

Linked to	Links to other related recommendations or sections of the report
Priority	Urgent – action needed immediately to reduce unacceptable risk High – action needed as high priority to control a safety risk (commence within one month) Medium – action needed to control risk (commence within three to six months) Low – action suggested to support longer term improvement in safety management (within 12 months)
Timescale	Suggested duration of project or delivery of recommendation
Cost	Estimate of the cost of delivering the recommendation, if relevant. 'N/A' is used to denote no expected cost other than within normal internal resource levels

2. Review of the process of regulatory oversight

2.1 Review of role and function of the RSC

2.1.1 Background

The Interim Railway Safety Commission (IRSC) was established in 2001, following the publication of the Railway Safety Bill, taking over from the Railway Inspectorate. The IRSC operated with the existing (limited) powers of the Railway Inspectorate as it prepared to become the Railway Safety Commission (RSC).

Although the IRSC could prepare for its new role as the RSC, it could not act as the RSC until the Railway Safety Bill completed the legislative process in late 2005, and became The Railway Safety Act 2005. Under the Act the Railway Safety Commission began operation on 1st January 2006, with a phased introduction of its powers.

Minister for Transport, Martin Cullen TD 'officially' launched the RSC on 8th February 2006. The proposed timetable for introduction of three of the sections in the 2005 Act that require Commencement Orders are:

- Section 39 (Safety management system and safety case) 1st May 2006
- Section 42 (Safety assessment of new works) 1st May 2006
- Section 43 (Safety assessment of new rolling stock) 1st September 2006

This means, for example, that the six-month period for preparation and submission by IÉ (and the other Railway Undertakings) of their Safety Case begins on 1st May. The RSC have stated that once a Railway Undertaking has an assessed and accepted Safety Case, then the RSC will then begin its monitoring and enforcement activities. This replaces the previous regime operated by the Railway Inspectorate.

This review was commissioned by the IRSC, and commenced in November 2005 before the IRSC became the RSC. The review has included interviews with all the members of the RSC, with the Commissioner and Principal Inspector both interviewed before and after the RSC came into being. Hence this review has only covered the first two months of actual operation as the RSC out of interim mode. From these interviews, a document review and the wider review (including IÉ and DoT) we are able to draw conclusions and make recommendations on the process of regulatory oversight.

The Railway Incident Investigation Unit is covered in Section 2.2 under the Department of Transport.

2.1.2 Functions and duties of the RSC

The RSC has three principal functions (as set-out in Section 10 of The Railway Safety Act 2005):

- To foster and encourage railway safety
- To enforce the Railway Safety Act 2005 and other legislation relating to railway safety
- To investigate and report on railway incidents

The second function relating to the Railway Safety Act 2005 is expanded further into six main duties:

- To assess the Safety Cases of railway operators and issue safety certificates
- To carry out safety assessments of new works
- To carry out safety assessments of new rolling stock
- To make regulations in relation to specified aspects of railway safety
- To carry out inspections of railway infrastructure, operations and management systems
- To take enforcement proceedings where necessary, including the use of mandatory prohibition and improvement notices and High Court injunctions

2.1.3 Planning and monitoring delivery

The RSC develop an annual Business Plan that covers the specific actions to be taken, currently under 11 activity headings. These activity headings relate to the functions and duties of the RSC. Alongside each action in the Business Plan is a Key Performance Indicator, as well as assignment of the action to one or more members of the Commission. This is an explicit method for ensuring that the RSC discharges it responsibilities effectively.

In the 2006 Business Plan the following activities are planned:

- Safety Auditing and Monitoring
- Safety adequacy assurance of new infrastructure and rolling stock
- Accident monitoring, response and investigation
- Safety Case development and approval
- 3rd Party Interface
- Continuing Professional Development
- Provision of technical support (to the Department of Transport)

- EU
- Administration
- Corporate Governance
- Management

The EU, Corporate Governance and Management activities have been broken out as new groups of activities in the 2006 plan compared to the 2005. This demonstrates that the demands on and functions of the RSC are being considered and these are reflected in the planning and delivery processes.

Corporate Governance reflects the need of the RSC to operate its own systems such as finance and human resources, whereas previously these functions have been undertaken by the Department of Transport (DoT). The EU activity is designed to capture the participation by RSC staff in the activities of the European Rail Agency (Administrative Board, working groups on Common Safety Targets and Common Safety Indicators, participation in the 'safety authority' and 'investigator' networks) and the time spent providing support to the DoT technically for DG-TREN Interoperability and Safety Committee meetings.

From the Business Plan, a detailed breakdown of expected effort by every member of the Commission against each of the specific action under the 11 activities is developed. This detailed breakdown is then used to monitor how the Commission staff spends their time, based on weekly recording and reporting.

The Department of Transport have expressed that the RSC's role in the process of regulatory oversight can only be effective if the RSC know and understand activities and performance at the 'sharp-end' of railway operations by spending sufficient time in the field. Several Commission staff interviewed felt that during 2005 they had not yet been able to spend sufficient time on 'field based' activities for several reasons:

- Limited powers while the Commission was still 'interim'
- Increasing approvals workload that required more 'office time'
- Shortage of staff (staff numbers were increased in 2005 – see section 2.1.5 for more information)
- Limited information from IÉ on accidents and incidents
- Inability of the Commission to 'self-protect' when on IÉ infrastructure requiring protection to be arranged with IÉ. Track safety training was undertaken in 2005 but this did not lead to RSC staff being able to exercise 'self-protection'

The issue of protection whilst on the infrastructure has yet to be resolved, and requires a protocol to be finalised and committed to paper. As a point of reference, in GB, HMRI Inspectors 'Warrants' give them the authority to access Network Rail's Controlled Infrastructure (without the need for Personal Track Safety). However, Inspectors are trained and certified in Personal Track Safety (and have SENTINEL Cards showing the relevant competence).

Additionally, Inspectors are trained by a Network Rail recognised trainer to the Controller of Site Safety (COSS) standard and undergo the usual tests/exams. At the completion of this process, HMRI provide the individual with COSS certification, not via SENTINEL. HMRI then provide the required mentoring (as is required for COSS).

The usual process for Inspectors accessing infrastructure, is for the Inspector to arrive at the Network Rail 'control' and to 'commandeer' a COSS and protection staff from Network Rail. This obviously takes a short time, but is essentially a 'turn-up and go' approach, enabling Inspectors to gain relatively quick access to infrastructure.

In exceptional circumstances, an Inspector can use his COSS competence to self-protect, but this requires explicit approval from his or her Principal Inspector and all the necessary planning/risk assessments to be undertaken. This is designed to cover instances where unsafe situations are reported to HMRI where immediate attendance is required - the number of times this is used is very small (if any at all).

Consideration of these arrangements used in GB could provide a useful basis for finalising a protocol for the RSC accessing IÉ infrastructure, considering unplanned or 'emergency' access, as well as more routine access (see RSC1 below).

Recommendations

RSC1	**Staff field time**: The RSC need to ensure that their staff spend sufficient 'field time' to allow them to exercise their role effectively To facilitate efficient access, the RSC should develop, with IÉ, a protocol for inspectors accessing railway infrastructure. This should cover both planned visits and unplanned emergency visits (for example where unsafe situations are reported)	
	Linked to	CL1 (focus of activity of RSC field time)
	Priority	High
	Timescale	6 months
	Cost	N/A

Based on the findings of this review (see Chapter 3), suggestions are made for how the RSC could most effectively focus their 'field time' (see recommendation CL1). This

includes, IÉ safety audit programme, asset rating, competence management, safety briefings and provision of lookouts and Track Safety Coordinators

2.1.4 Vision for the RSC at end of 2006

As part of this review process the Commissioner (who heads the RSC) described three specific goals, as part of his vision for the RSC at the end of 2006, reflecting that the RSC is a 'new' organisation:

- To have the RSC fully staffed
- To have all the operational processes fully established and relationships on a 'stable basis', recognising common goal of 'safety' while also recognising the RSC's role as the regulator
- To have the capacity to undertake the core functions while maintaining involvement in Europe (particularly the European Rail Agency) and international groups (for example the International Liaison Group of Railway Inspectors)

In our view, these three vision elements are realistic and set a reasonable degree of challenge for the remainder of 2006.

2.1.5 Human resources

The current manpower allocation of the RSC (seven technical and two support staff) is based on a consulting study conducted in 2000 (by IRMS and PA Consulting). The analysis that formed the basis of the report is to be re-run shortly to reflect the increase in the RSC'w workload generally, and in particular the increased approvals work currently being undertaken (compared to that envisaged in 2000). The approvals work is expect to grow further (described as a 'step-change' in workload) as the Transport 21 agenda moves forward. In addition, the participation by the RSC in activities of the European Rail Agency (which is important to influence European policy and develop and maintain networks) is higher than was originally anticipated.

Since 1999 the Railway Inspectorate (and then IRSC) has grown but the recruitment of suitable technical staff has been difficult. The RSC report that three open competitions have thus far been held, in September 2004 for Inspector and Senior Inspector grades, in October 2005 for Senior Inspector, Chief Investigator and Office Manager grades, and in March 2006 for the Chief Investigator and Inspector positions. The September 2004 competition failed to attract any suitable candidates for Senior Inspector and the October 2005 competition failed to attract any suitable candidates for the post of Chief Investigator. The March 2006 competition was again unsuccessful for both posts, despite advertising in the UK national press.

The RSC currently has two key vacancies; Chief Investigator of the Railway Incident Investigation Unit and an Inspector for the RSC. Neither post has yet been successfully

filled despite advertising widely, including several UK rail publications and the UK national press. The lack of success in attracting and recruiting senior staff to the RSC is a serious concern which needs to be addressed, particularly considering that even when the full complement of seven staff have been appointed, there is concern over whether this will be sufficient.

In our opinion, even if the pending analysis of the RSC workload shows that the RSC need additional staff, it will not be a rapid process to fill these positions. Therefore the RSC will need to prioritise its activities, and either delay or outsource those activities that it cannot fully resource.

In November 2003 the Government published plans to decentralise 12,000 civil servants and state agency staff to a number of provincial locations. A number of European governments have followed similar programmes, designed to boost provincial economies and lower the overall cost of providing government services (as provincial locations do not attract the premiums that capital cities do). Within this plan, it is proposed to relocate the RSC to Ballinasloe, about 100 miles from Dublin (2 hours by train).

The plan for decentralisation will mean that to become a highly effective regulator RSC will have to overcome additional challenges:

- The majority of work undertaken by the RSC relates to the Greater Dublin Area, reflecting the core activities and distribution of passenger movements of the railway[1]. Rapid response to railway accidents or incidents will also be more challenging since approximately 75% of rail passengers are carried on suburban and DART services in the Greater Dublin Area
- A move of the RSC from Dublin is likely to reduce 'face-time' with IÉ, Connex and the Department of Transport who are all Dublin based. Experience from elsewhere (including GB) suggests that effective regulatory oversight is facilitated by good relationships between those being regulated and the responsible Government department, so a reduction in face-time will make this more of a challenge
- Recruitment into the RSC has already proved difficult and the challenge of successful recruiting may increased further since Ballinasloe is likely to be perceived as less attractive as a location than Blackrock, Dublin. Retention of existing staff may also be an issue if the RSC is relocated to Ballinasloe

[1] Analysis undertaken by the RSC shows that in the 2002/03 financial year 75% of the activities undertaken related to the Greater Dublin Area, in part because IÉ, Connex and Department of Transport are all Dublin based. It is estimated that 75% of approvals work, particularly relating to Transport 21, will relate to Greater Dublin Area projects. The safety monitoring activities will also need to be focused on the Greater Dublin Area, consistent with the proportion of rail passengers carried on suburban and DART services.

- Increased average staff travel times will mean that more of the working week is spent away from carrying out core regulatory activities

It is possible that additional recruitment of RSC staff could help to overcome some of these issues, although relocation itself may mean recruitment is even more of a challenge. In our view, therefore, there is the need for a review of the implications of relocation and resources.

Recommendations

RSC2	**Fill senior vacancies:** The RSC and Department of Transport should fill senior RSC vacancies as a matter of high priority, which may include a review of the attractiveness of the compensation packages to ensure high quality candidates are attracted. Until the Chief Investigator is appointed the Department will need to make temporary arrangements to ensure the requirements of European Railway Safety Directive (2004/49/EC) are met and that Ireland is effectively represented in railway accident investigation matters in Europe	
	Linked to	RSC3
	Priority	High
	Timescale	3 months
	Cost	Within current staffing plan

RSC3	**Review implications of relocation:** The RSC should review the implications of the proposed relocation to Ballinasloe, considering the potentially adverse impact on the effectiveness of the process of regulatory oversight. The review should balance the potential cost savings of relocating staff out of Dublin, against the potentially increased difficulty of recruitment, and the impact on the efficiency and effectiveness of the core RSC role. This needs to be considered alongside recruitment (and retention plans)	
	Linked to	RSC2, RSC1
	Priority	High
	Timescale	6 months
	Cost	N/A

2.1.6 Interfaces and working relationships

The RSC appears to have effective working relationships with DoT and the other regulatory bodies it interfaces with. These relationships have not been explicitly tested, however, since through the course of discussions there was no indication of any major weaknesses in this area.

The relationship between the RSC and IÉ is, however, more complex. On a positive note, based on observations during this review, and from the opinion of those interviewed, the relationship is regarded as productive and a number of meetings take place periodically and appear to work reasonably well. However, there are a number of

examples where IÉ has apparently failed to provide information to the Commission. In one example, a particular accident investigation report was apparently promised to the RSC by IÉ but was never delivered – (this report has been reviewed for this study, so it does exist). This 'cautious' approach adopted by IÉ in providing information to the RSC has also been observed by the Department of Transport.

It is clear that if a truly cooperative and open relationship is to exist, then both the RSC and IÉ will need to formulate a protocol for the way of working together, specifically to manage the flow of information between parties, and more broadly how the new regime of regulatory oversight will work in practice. This applies to both parties; the RSC need to be clear about what information is requested (and what type of information is likely to be requested to ease the burden on IÉ), and IÉ need to make reasonable effort to provide information in a timely and efficient manner. Indeed, one purpose of the Railway Safety Case is to provide a high-level summary of safety management information that the RSC can use as a 'roadmap' to seek more detailed information, carry out inspections etc.

In some interviews with IÉ, the role and function of the RSC did not appear to be well understood, or at least, expectations of the role were not clear. This is not a surprise, as IÉ has not previously been subject to the current level of external scrutiny on safety as is being applied now following the enactment of The Railway Safety Act 2005.

Currently IÉ collects and publishes internal details on accident and incidents – data on numbers as well as the investigation reports. IÉ has stopped its historical practice of providing these reports routinely to the Railway Inspectorate (now the RSC) apparently because of concerns about the reports being published under Freedom Of Information (FOI) Act requests. The criteria currently used by the RSC to compile accident and incident data are not fully aligned with the criteria used with IÉ. Members of the Commission are participating in setting Common Safety Targets and Indicators through the European Rail Agency working groups but these targets and indicators are not expected to be agreed in the short term. These different criteria do not present a safety or regulatory problem, but are difficult to understand and justify.

IÉ have developed a Network Risk Model (which is described in section 3.6). The model has been used to drive the risk-based safety investment in the IÉ network under the Railway Safety Programme 2004-2008 and will form an important part of the arguments of the IÉ Safety Case (to be assessed by the RSC later in 2006). To date members of the Commission, as well as members of the Department of Transport, have attended briefing sessions run by IÉ's model development contractor, mainly to help raise awareness of the basic model capabilities and purpose. Moving forward the RSC will need to decide what level of understanding it requires of the IÉ Network Risk Model in order to be able to assess the Safety Case and provide effective challenge and regulatory oversight of IÉ. This does not necessarily imply that the RSC needs a detailed understanding of the workings of the Model, but it would, for example, be beneficial to be able to effectively challenge the assumptions underpinning the model, and validation and calibration activities.

Recommendations

RSC4	**Increase proactivity:** The Railway Safety Commission should move towards a more proactive and leading role, setting out clearly to IÉ how their core functions will work in practice. This will help to bring about a greater clarity to both parties regarding what the role will entail, and so allow IÉ to prepare for providing additional information as requested	
	Linked to	
	Priority	High
	Timescale	6 months
	Cost	N/A

RSC5	**Agree criteria for reporting:** The Railway Safety Commission should agree criteria with IÉ for the reporting of accident and incident data and investigation reports in advance of agreed criteria being published by the European Rail Agency	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

RSC6	**Effective challenge of Network Risk Model:** The Railway Safety Commission should decide what level of understanding it requires of the IÉ Network Risk Model to provide an effective challenge on the core risk assessments carried out by IÉ	
	Linked to	Section 3.6 (Network Risk Model), NRM1, DT1
	Priority	Medium
	Timescale	< 6 months
	Cost	N/A

2.1.6 Provision of guidelines

To help discharge its first two functions (to foster and encourage railway safety and to enforce the Railway Safety Act 2005 and other legislation relating to railway safety) the Railway Safety Commission is planning to publish three sets of guidelines in 2006. Draft versions of these guidelines are already available on the Commission section of the Department of Transport website (www.transport.ie) so that IÉ and other Railway Undertakings can use them. The guidelines and their current status is as follows:

- Guidelines for the Safety Assessment of New Infrastructure Works and New Rolling Stock are due to be sent out to Railway Undertakings for comment shortly
- Guidelines for the Design of Railway Infrastructure and Rolling Stock have been commented on by Railway Undertakings and are now being finalised
- Safety Case Guidelines have been available in draft since 2001 and are expected to be finalised without any changes in content as IÉ and the other Railway Undertakings are using them to prepare their Safety Cases for submission this year

Most relevant to this review are the Draft Guidelines for Railway Safety Cases, as published on the Department for Transport website:

- The Background Note at the start of the guidelines is dated July 2001 and talks about the Railway Safety Authority and intention of having the Railway Safety Bill 'enacted by the end of 2001' – although these are not material safety issues, as publicly available document these do not necessarily create the impression of a modern regulatory regime
- The guidelines say 'subject to adoption by Railway Safety Authority' so need to be formally adopted by the RSC
- In our opinion the guidelines may benefit from the following, all of which are considered to be minor, but should be considered at the next revision:
  - Splitting 'Organising, Planning and Implementing' into 'Organising' and 'Planning and Implementing' to provide greater focus in line with the safety management system model in the UK published by the Health and Safety Executive (HSE). In the HSE model 'competence, cooperation, control and communication' all sit within 'Organising'
  - Annual Safety Plans might be better located under 'Planning and Implementing' rather than within 'Performance Review' and
  - 'Co-operation with Others' within 'Accident and Incident Investigation' appears to duplicate the 'Co-operation' requirements currently within 'Organising, Planning and Implementing'

- Annexes A2 New Works Assessment and A3 Rolling Stock Assessment appear to duplicate requirements with the Railway Safety Act 2005 and separate guidance in these areas are already available in draft from the Railway Safety Commission (as described above)

In GB the Railways (Safety Case) Regulations 2000, including 2001 and 2003 amendments, are being replaced by the Railways and Other Guided Transport Systems (Safety) Regulations to meet the requirements of the European Railway Safety Directive (2004/49/EC). This will mean a transition from the existing Safety Cases to safety certification and authorisation instead. The RSC will need to review the requirements of the Directive to see if any changes are required to the Safety Case Guidelines.

Recommendations

RSC7	**Reissue safety case guidelines:** The Railway Safety Commission should update and re-issue the Guidelines for Railway Safety Cases: • All references to the Railway Safety Bill 2001 and Railway Safety Authority should be updated to Railway Safety Act 2005 and Railway Safety Commission • The structure of the guidelines must remain logical • Ensure that the guidelines meet the requirements of the European Railway Safety Directive (2004/49/EC) • Including Northern Ireland Railways as a Duty Holder • Implement minor structural improvements as suggested in this report In the meantime, all railway undertakings should continue to progress their safety cases for submission using the existing safety case guidelines	
	Linked to	
	Priority	High
	Timescale	1 month
	Cost	N/A

From experience in GB, the process of developing a Safety Case has been found to be of as much if not more value than the actual document produced.

2.2 Department of Transport

2.2.1 Background

The Department of Transport has a number of roles relating to the railway network, several of which relate to the process of regulatory oversight.

Since 1st January 2006, the Railway Safety Commission has been independent of the Department of Transport. The Department still retains a corporate governance role, but is not involved in the regulatory processes managed by the RSC.

The Department has a key role in promoting railway safety. This includes participation in the Railway Safety Task Force, that has set the budget for the safety investment in the periods1999-2004 (1st phase) and 2004-2008 (2nd phase). The 2004-2008 programme involves a spend of €512m, of which €444m is on infrastructure. The financial monitoring of the budget spending under the programme is overseen by the NDP Monitoring Committee, with day to day monitoring undertaken by the Railway Safety Division and the Investment Monitoring Division within DoT. In addition the Department is involved in bi-monthly meetings with IÉ, involving the RSC, alternating on high level safety and high level development issues.

2.2.2 Risk-based investment

The development of the 2004-2008 phase of the programme involved targeting the investment on further reductions in railway risk, thus demonstrating value for money. Engineering judgement within IÉ was therefore supported by analysis of results from the Network Risk Model, which was developed by IÉ although 'driven' largely by the needs of the Department. (A review of the Network Risk Model as a decision-making tool is contained in section 3.6 of this report).

One issue for the Department is that it lacks any expertise in the modelling of railway safety risk, and so relies on IÉ to provide advice on the model functionality and results. While responsibility for the model must of course remain with IÉ, in our view it would be beneficial for the Department to have the capability of providing an effective challenge of the model development process and the results produced. This would help to provide reassurance that the cost of model development, and any decisions made on the results are justified.

DT1	**Improve understanding of risk model:** Department of Transport should obtain independent advice on the IÉ Network Risk Model development process and results to ensure it can provide effective challenge	
	Linked to	RSC6, NRM1
	Priority	Medium
	Timescale	6 months
	Cost	Approx €30k per year for external consultant

2.2.3 Technical advice

The Department uses the RSC to provide some technical advice (for example assisting/participating in the European Union DG-TREN Interoperability and Safety

Committee meetings), as within the Department, there is no group of railway professionals that can provide technical advice. This is explicitly recognised in the RSC Business Plan. A former GB HM Railway Inspector provides further advice to the Department when required.

Given that one of the roles of the Department is to promote railway safety, we consider there may be value in the Department recruiting a senior railway professional to provide in-house technical advice and where necessary to co-ordinate the sourcing of this advice from outside the Department. One of the key roles of this new post would be to ensure that the safety investment meets and demonstrates 'value for money'; in our view the current budget of €512m in the 2004-2008 period would justify additional technical scrutiny to ensure that investment is focused on reducing the highest safety risks, consistent with ALARP, and good practice from elsewhere. After periods of sustained investment in other European railways, questions have been asked about whether the investment was justified. This new post would provide further demonstration of good corporate governance, particularly to outside stakeholders.

DT2	**Recruit railway professional:** Department of Transport should consider recruiting a senior railway professional to increase the capability of the Department in promoting railway safety, and in checking that investment proposals are 'value for money'	
	Linked to	RSC2 (senior vacancies at the RSC)
	Priority	Medium
	Timescale	12 months
	Cost	Salary plus fringes per year

2.2.4 Railway Incident Investigation Unit

Under the new regulatory regime the Railway Safety Act 2005 creates a Railway Incident Investigation Unit (RIIU) with a Chief Investigator. The Chief Investigator is expected to be located with the RSC for 'pay and rations'. The Unit will 'carry out its functions independent from the other functions of the Commission' [Railway Safety Act 2005 Section 55 (1)]. This independence from the safety regulator is necessary to fulfil the requirements of the European Railway Safety Directive (2004/49/EC).

The Chief Investigator was not in-post (nor recruited) at the time of the study and so it has only been possible to review the function of the Railway Incident Investigation Unit to a very limited extent.

We are concerned that this important position remains unfilled despite recruitment efforts, as it is unclear how the duties of the Unit will be effectively discharged. We are aware that the DoT has plans to ensure the requirements of the EU Directive are met on a temporary basis from April 2006. We also understand that in the absence of a Chief

Inspector, the Commissioner has been attending the European Rail Agency discussions on accident investigation, but this situation remains problematic. (See recommendation RSC2).

3. Review of railway safety

3.1 Background

This chapter covers a review of IÉ's safety management arrangements, structured as follows:

- **Railway Safety Programme progress:** provides an overview of the progress of specific areas of the Programme, and a review of the progress reporting arrangements
- **Safety Management Systems:** covers Company Standards, implementation of SMS, specific areas such as monitoring, competence and audit, decision-making and culture
- **Network Risk Model:** provides a review of the process surrounding the development and use of the Model
- **Operations:** covers safety issues relating to the Operations Department
- **Permanent way:** covers safety issues relating to permanent way (Infrastructure Department)
- **Structures:** covers safety issues relating to structures (Infrastructure Department)
- **Signalling, Electrical and Telecommunications:** covers safety issues relating to Signalling, Electrical and Telecommunications (Infrastructure Department)
- **Traction and rolling stock:** covers safety issues relating to traction and rolling stock (Mechanical Engineering Department)
- **Electrification:** covers safety issues relating to Electrification and Power (Infrastructure Department)

It should be noted that some issues were identified in specific departments that relate to general IÉ management systems, and so these have been consolidated. Extensive cross-referencing is provided to provide traceability on the source of issues raised.

3.2 Railway Safety Programme progress

IÉ are in the third year of the second phase of the Railway Safety Programme:

- Part A: Safety Management System (€30m)
- Part B: Infrastructure Programme (€444m)
- Part C: Human Performance (€38m)

The document 'Railway Safety Programme 2004-2008' provides a list of all items across the three parts, and also defines how the Programme is to be delivered. It states that an independent senior manager, reporting directly to the Managing Director, will have specific responsibility for coordinating the Programme. IÉ have outlined the principle that delivery of all projects will be aligned with the relevant senior line responsibilities; for example delivery of Part B of the Programme is the responsibility of the Chief Engineer Infrastructure or Chief Mechanical Engineer, and Part A is the responsibility of the Chief Safety and Security Officer.

In practice, IÉ have not formally appointed a Programme Coordinator, although the Strategy and Finance Manager provides oversight and reporting of the financial status of all items within the Programme. However, there is no single person allocated to 'drive' the Programme forward. This is less of an issue for Part B of the Programme, since project arrangements are necessarily more formalised and driven through the relevant Infrastructure managers. For Parts A and C, the Safety Performance Manager conducts regular checks of project status, through discussions with those managing them, and summarises the status in a brief tabulated progress report. Projects making slow progress are specifically highlighted. A bi-monthly meeting is normally held by the DoT, with the RSC also attending, where IÉ report on specific Key Performance Indicators (which were previously agreed), although apparently the most recent meetings have not gone ahead.

Of 51 projects within Parts A and C the latest report[2] gives the following status:

- 23 are 'in place'
- 27 are 'in hand'
- 1 has 'no progress'

Having reviewed the latest progress report and associated documentation we have three concerns:

- The allocation of project status for some projects appears to be potentially misleading, for example:
  - SMS1 (developing personal performance contracts) is reported as 'in place', although there is over €2m budget outlined in the remainder of the Programme, and the report states that the plan for 2006 is 'ongoing application'
  - SMS2 (Infrastructure Asset Management System) is also reported as being 'in place', although again there is over €0.5m outlined in the remainder of the budget, and an extensive plan of training marked for 2006

[2] At the time of this study

- We have been unable to identify a clearly defined scope, objectives and success criteria for each project within Parts A and C of the Programme. Such parameters are widely recognised as being a key requirement of successful project management, and it is surprising that they have apparently not been defined given the overall size of the budget.
- The tracking of progress lacks detail (although financial tracking of projects is reported separately, the concern here relates to the work being delivered)
- For certain projects, budgets appear to be high compared with the work that is being reported:
  - SMS1 (developing personal performance contracts) has an allocated budget of nearly €800k per year, but it is not clear what this is for
  - SMS8.1 (culture Survey). The project provides for an annual survey of safety culture with a budget of over €100k. Our understanding is that the most recent culture survey was carried out internally by IÉ and involved reissuing a previously prepared questionnaire across the company. On this basis it would seem that the budget is excessive, as €100k would be sufficient for appointing an external consultant to carry out a full culture review

Although the progress report is only intended to be an overview of status project-by-project it would seem that, given the size of Parts A and C of the Programme, more formal and detailed progress reporting (both internally and in meetings with the DoT and the RSC) would be justified. The budgets that were originally estimated during the preparation of the Railway Safety Programme appear not to have been subsequently reviewed, and in some cases may be higher than is now required.

Recommendations

SMS1	**Review budgets for Part A and Part C projects:** IÉ should review the allocated budgets across all 51 projects within Parts A and C of the Railway Safety Programme, and define more clearly project scope and objectives for projects which have not been fully completed. The revised budgets and project scopes should then be clearly reported to the DoT at a formal meeting, with the overall aim of increasing the level of understanding of progress and ensuring clear demonstration of 'value for money' Depending on the outcome of the review, DoT could conduct an audit fo spend on Parts A and C of the Programme	
	Linked to	DT2, SMS2
	Priority	High
	Timescale	1 month
	Cost	N/A

SMS2	**Maintain progress on Railway Safety Programme:** In the absence of a dedicated Programme Coordinator, IÉ should strengthen and formalise regular reporting on projects under Parts A and C Railway Safety Programme, to help maintain progress and ensure projects deliver against defined scope and objectives. This could be achieved by the Chief Safety and Security Officer (who is responsible for delivery of the Safety Management component for the Programme) reporting at the Safety Review Group	
	Linked to	SMS1
	Priority	Medium
	Timescale	Ongoing to 2008 for current phase of the Programme
	Cost	N/A

3.3 Safety Management System (SMS)

3.3.1 Company Standards

IÉ's Safety Management System provides a structure for the delivery of the Company Safety and Loss Control Policy, which sets out IÉ's commitment to the safety of its customers, employees and members of the public. The Safety Management System is based around ten Company Standards, 34 Railway Standards, a wide range of Departmental Standards and a Rule Book. The areas covered by the ten Company Standards are set out in Table 1.

Table 1: Company standards

No.	Standard for:
1	Production of Safety Standards and Procedures
2	Safety Monitoring
3	Safety Validation of Organisational Change
4	Reporting and Investigation of Accidents and Incidents
5	Management of Risk
6	Safety Validation of Changes in Plant, Equipment, Infrastructure or Operations (PEIO)
7	Training and Competence
8	Procurement and Contractors
9	Document Control
10	Emergency Response

The purpose of the ten Company Standards is to provide a framework for translating the IÉ Company Safety and Loss Control Policy into practice. Additionally, the Standards are intended to ensure cross-business safety management, and provide a framework for each part of the business to manage safety according to their own specific operations and associated risks. The Company Standards are owned by the Safety Department, but responsibility for delivering against their requirements sits with the Professional Heads (for Infrastructure, Operations, Mechanical Engineering, Signalling and Power, and Telecoms).

Content and coverage: The ten Company Standards provide reasonable coverage of the elements that would be expected at this top level of a Safety Management System. The Railway Standards and Departmental Standards were not extensively reviewed for this assignment.

Company Standard 1 ("Standard For Production Of Safety Standards and Procedures" states that "[standards] be reviewed within 3 years of date of issue or as required". Nine of the Company Standards were last reviewed in December 2002, so are now overdue for review. The exception is Standard 6 ("Safety Validation of Changes in Plant, Equipment, Infrastructure or Operations") that is dated June 2003. Standard 5 (Management of Risk) is currently undergoing a comprehensive review based on feedback received from throughout the organisation. The standards do not include a log of changes, so it has not been possible to determine the nature and extent of changes made during the last review.

There is currently considerable overlap and repetition between Company Standard 1 (Production of Safety Standards and Procedures) and Company Standard 9 (Document control). Areas of repetition include document ownership, the system for numbering and references, the process for issuing and distributing Standards, and the process for review and revision of the Standards. Whilst not a particular safety concern, good practice in safety related documentation is to avoid overlap as it can cause confusion and creates unnecessary volume.

We have seen evidence of the implementation of Standard 3 (Safety Validation of Organisational Change), and we understand it has been applied to several recent changes:

- Centralising Management and Outsourcing of Mechanical Maintenance, Permanent Way
- Proposed realignment of Fleet Managers within the CME Department
- Changes to Infrastructure
- COO Organisation (introduction of the General Managers)

The Standard appears to be thorough, and encourages consideration of a wide range of potential safety impacts of organisational change. With the recent promotion of the COO to Chief Executive (leaving no COO in place), and the implications on reporting lines on safety issues, we expect that the process will be required for this organisational change.

Review of standards: We understand that IÉ decided in mid-2005 not to re-issue the Company Safety Standards until the content of Railway Safety Act was finalised, and the Act was in force. However, we understand the intention is to complete the re-issue of the Company Standards before submission of the Safety Case on 1st November 2006. This appears to be a sensible decision given that the Safety Case provides an overview to the whole Safety Management System, and therefore it will be important to ensure the SMS is up to date at the time of submission.

Under the current system, nine of the ten Company Standards are due for review simultaneously every three years. Concern was expressed during the interviews that this resulted in a high workload over a short period, requiring considerable resource from within the Safety Department and potentially diverting attention away from ongoing activities. It was also suggested that this may have been a contributory factor to the fact that the review of most of the Standards is now overdue. A related issue is that some interviewed consider the Safety Management System documentation to be too complex (refer to below); in this context making the process of updating the standards more time consuming.

Compliance: A number of interviewees revealed that a key area for improvement is alignment of actual practices on the ground with those set out in several of the Standards (e.g. Standard 4 Investigation of Accidents and Incidents, Standard 10, Emergency Response). For example:

- The Safety Department usually either Chairs or is involved in the investigation of those accidents/incidents with the highest potential, which contradicts Standard 4 which states that Safety Department 'will not lead investigations, except in certain circumstances at the wish of Managing Director'
- No training has been delivered for more than one year and therefore not all involved in leading/participating in investigations are 'authorised investigators'
- Not all of the local Emergency Response Plans showed evidence of being updated annually, as required by Standard 10
- Standard 10 also states that the Manager Safety (now the Chief Safety and Security Officer) will "arrange exercises (full-scale or table-top) and other training as necessary" – in some locations there was no evidence that the emergency response

procedures had been tested, even as desk top exercises, and this was confirmed by the IÉ internal audit findings from a recent PAL audit

It cannot be inferred from this that actual practices are unsafe, but a misalignment between intended (and mandatory) processes, and actual practice undermines the value of the documented system, and makes it difficult to provide the required assurance that safety is being robustly managed. This is particularly relevant given the new regulatory arrangements, in which IÉ will need to present a robust case for safety to satisfy the RSC.

Specific comments on the Company Standard for Safety Monitoring (Standard 2), and the Company Standard for Investigation of Accidents and Incidents (Standard 4) can be found in later sections of the report.

Recommendations

SMS3	**Review and update Company Standards:** IÉ should review and update the Company Standards to include the following: • Clarification and communication of exactly which aspects of the SMS are mandatory, and which are recommended good practice - where actual practices do not match the Standards, IÉ should either update the Standard, or put measures in place to improve compliance • Reflect changes in the overall safety management arrangements, organisation, and regulatory system • Consider the integration of Standards 1 and 9 to remove repetition and overlap The review could usefully form a phased plan for implementation with specific milestones and deadlines (which could be referenced in the Safety Case) IÉ should develop an implement a specific strategy for the Safety Management System in the Mechanical Engineering Department, to either align it with Company Standards, or define core requirements which must be followed and acceptable differences from the Company systems	
	Linked to	SMS14 (audit)
	Priority	High
	Timescale	Before Safety Case is issued
	Cost	N/A

SMS4	**Review management of Company Standards:** IÉ should review the process for managing and updating the ten Company Standards, to ensure it is practical to maintain. Specifically: • Review of the Standards should be staggered over the three year review cycle, to manage the workload involved in review and update • Changes made to the Standards during the review process should be logged in each Standard so there is a clear record of what has been updated • An issues log should be maintained for each Standard to ensure required changes are not missed during the periodic review. In addition, should an issues log reach a certain size, this should be a trigger for a review of the Standard, even if this occurs before the next periodic review is due	
	Linked to	SMS3
	Priority	Low
	Timescale	12 months
	Cost	N/A

SMS5	**Document Control:** IÉ should finalise introduction of an electronic Controlled Documents System and ensure that all appropriate documents are either reissued or existing documents are endorsed accordingly. Where controlled documents are held on the company intranet but are likely to require hard copies, for example, to be used 'in the field', consideration will need to be given to how these are controlled A comprehensive schedule of current standards, procedures and working instructions should be prepared and briefed to all staff to clearly identify their correct revision/issue and status	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

3.3.2 SMS awareness and implementation

The IÉ safety management system (SMS) has been in place for a number of years. The earliest Company Standards date from February 1998 and the most recent addition, Standard 6, has been in place since 2000, reviewed in 2003. In addition, much of the SMS represents a hierarchical structure which was put in place around existing documentation, such as the Rule Book and the Railway Standards.

Understanding of Standards: Overall, awareness of the main aspects of the Company Standards is reasonable amongst senior staff, including General Managers, Chief Engineers and Divisional Engineers, although some lack a detailed understanding of the contents. At District Manager level, awareness of the Company Standards is weaker (and variable across districts), but this is probably because many of the Standards are not used, nor are intended to be used, in day-to-day activities and operations. Awareness of Standard 2, Safety Monitoring, and Standard 6 Safety Validation of Changes in Plant, Equipment, Infrastructure or Operations, the most commonly used Standards, was generally good.

Ground level compliance: Understanding of the SMS "on the ground" is felt by many interviewed to still be a major area for improvement, with some way to go to increase knowledge, understanding and compliance. While safe practices may generally be followed, this is mainly acknowledged to be on a largely "informal" basis. (See section 3.5 Safety Culture for more detail). New hires are generally perceived to be more willing to adopt the correct procedures for working compared with those with many years experience. This may mean that over time, levels of compliance improve (29% of the workforce have less than 5 years experience), although this will only be possible with rigorous training, briefing of standards, audit, monitoring, and longer term competence management. IÉ are aware that all of these areas are key to improved safety management, and have made progress to varying degrees in each (see sections 3.7 to 3.12 for details).

Some interviewed commented that the volume and complexity of the documents that comprise the SMS is one of the reasons for the low levels of compliance on the ground. The complexity means that it is not 'user-friendly' to those trying to implement it in their everyday activities. Some feel that reducing the complexity of the SMS would facilitate better understanding and greater compliance. In addition, briefing of standards is seen by many as a weakness across IÉ, which will also contribute to low levels of compliance (see recommendation SMS6).

The Safety Department acknowledge that the Company Safety Standards themselves are not expected to be 'working documents' at the ground level. Several of the Standards are intended to be used as the basis for preparing supporting Divisional Standards, which become the high level working documents in each Division, with little need to refer to the Company Standards unless there is a change. In a number of areas initiatives have been put in place to translate the requirements of the SMS into useful working documents. For example, the creation of "Work Instructions" for infrastructure is seen as a positive step towards improving understanding and implementation of safe working practices at ground level.

The level of implementation of the SMS also varies across departments. Operations appear to be generally furthest ahead with implementation. In particular they have made the most progress in implementing Standard 2 (although the extent and quality of implementation is somewhat variable by location). Infrastructure are some way behind Operations in implementation, and specifically are only starting now to implement Standard 2, after development in 2005.

Mechanical Engineering: The safety management arrangements of the Mechanical Engineering Department are not formally aligned with the company-wide SMS, despite the 10 Company Standards being mandatory. There is no apparent strategy defining if or how Mechanical Engineering intend to develop their SMS further, by for example, linking the current, essentially ISRS based system, to the Company SMS. In addition, few Divisional Standards exist yet for Mechanical Engineering. Again, this is not to be taken as meaning that activities in the Mechanical Engineering Division are necessarily unsafe, but fundamental misalignment with supposedly mandatory Company Standards, can only be seen as a significant failure in IÉ's safety management arrangements as a whole. (See also recommendation RS1).

Recent audits carried out by the central Audit Team highlight areas where SMS compliance is poor. For example, initial (at time of writing unconfirmed) findings from an audit of Drogheda Depot (Mechanical Engineering) highlighted a number of issues:

- Standard 2 (Monitoring Standard) is not being implemented, particularly in relation to monitoring of human behaviour, as opposed to physical conditions
- The Safety Statement is not location specific, and there is no evidence that appropriate risk assessments and briefings of the Statement have occurred
- Safety diaries were not being used
- Incorrect recording of 'C' and 'D' rated incidents and accidents (not recorded on forms or logged in database)

All of the above audit findings independently confirm weaknesses that were raised in the interviews carried out for this review, suggesting that there is some understanding of which areas need most attention.

Infrastructure: The Railway Safety Programme 2004-2008 sets out the intention to develop a suite of Technical Standards for Infrastructure covering the specification, installation, maintenance, inspection and repair of infrastructure equipment. It was noted that there was currently a reliance on staff to use judgement rather than specific technical documentation, and this was leading to inconsistent installation, maintenance, inspection and repair of equipment. Items I3.1, I3.2, I3.3 and I3.4 of the Railway Safety Programme 2004-2008 allocate just over €2m for the development of a suite of Technical Standards for Infrastructure. The funding includes provision of a Systems Manager, a Document Control Manager, three technical specialists to support the development of the standards, and additional external expertise to assist in the development of Infrastructure Standards. The progress report on parts A and C of the Railway Safety Programme 2004-8 indicates that this has been translated into a target for IÉ of creating 250-300 Technical Standards for Infrastructure over the next 5 years.

Based on a review of the progress report on parts A and C of the Railway Safety Programme 2004-2008, it is not evident that this target of 250-300 standards is achievable. The report states that in 2004, 17 standards were developed, and in 2005, 40 were developed. The target stated in this report is to develop 25 per year for the next three years, which would lead to a total of 132 being developed over the five year period. Nonetheless, budget appears to have been allocated on the basis that 250-300 standards would be developed. If only half this number are to be developed, IÉ and DoT should review the implications on the allocated budget and modify it accordingly.

Given the issues raised previously regarding the maintenance, update and briefing of the ten Company Standards, we are concerned as to whether there will be sufficient resources available for the briefing, implementation, monitoring and updating of these 300 Technical Standards going forward. In addition, setting targets based on the number of Standards produced may not be the best strategy; adopting a risk-based prioritisation may be more appropriate, to ensure that the most important Standards are developed first, with Standards for practices in areas of lower risk developed later.

Briefing changes in Standards: the issue of the process of briefing out new and revised standards was raised in a number of areas (p-way, structures). Given the number of standards which comprise the SMS, at various different levels, a clear process for briefing out changes to relevant members of staff is important if compliance is to be improved.

Together with the lack of any system to log changes made to standards (see SMS4 above) it was not clear during this review how changes to standards were communicated. This includes changes to the high level Company Standards, and to Railway Standards and Departmental Standards (see recommendations PW4 and S1).

Safety briefings: the issue of safety briefings was also noted particularly in p-way. Staff at all levels recognise the importance of safety, and are positive in their approach to and attitude towards track side safety. The Safety Investigation Executive was consistently reported as providing useful support, with regular meetings and briefings to staff via the various safety representatives. Those interviewed in p-way reported that management and technical teams are represented at safety meetings and briefings and that the outputs are conveyed to the wider audience through the various safety representatives. However, no records were available to confirm briefings or attendance, and no formal process is evident for ensuring all staff are briefed, for example, capturing those that were not present.

Whilst the attitude to safety seems to have improved, one of the p-way interviews suggested that there is a belief by some senior managers that "safety is a given". For example, safety briefings and detailed planning are not always regarded as necessary, as staff will always 'work safely' without being told to.

Progress in implementation: in our view IÉ have been slow to implement the SMS, particularly given that most of the standards have been in existence for over five years. Although there has been recent progress, the rate of implementation can only be described as slow, given the length of time that the Company Standards have been in place.

Culturally, low levels of compliance with supposed mandatory systems can undermine the value of the system overall. Non-compliances which have become routine or embedded, mean that the system is likely to be disregarded, and create perception that other non-compliances are acceptable. Rolling out and successfully implementing of Safety Management Systems is always a challenge, but can be facilitated by focusing on key mandatory areas, and specifying which areas are targets (e.g. for compliance) at some specified time.

There is some acknowledgement within IÉ that progress with implementation has been slow, and so the plan is to tackle specific items. We consider that IÉ's plan to focus on key areas (e.g. monitoring, competence, risk assessment) is a sensible way forward and is improving understanding and implementation.

Recommendations

SMS6	**Clarify briefing process for new/updated standards:** IÉ should clarify the process for briefing out new standards, and briefing out revisions to existing standards, to all those to whom they apply. This should include a process for recording attendance at briefing sessions, and should be linked to the document management process (including logging changes to standards), to ensure all relevant staff receive copies of the new/revised standards	
	Linked to	SMS5 (document control), PW4 (completion and roll out of standards), S1 (training on standards)
	Priority	Medium
	Timescale	3 months
	Cost	N/A

SMS7	**Improve Safety Briefings:** IÉ should improve the quality, rigour and consistency of safety briefings across all departments, including depots. To be effective, this will need to be led from Senior Management downwards through the hierarchy of briefings. A formal system for recording attendance to safety briefings should be introduced, in order that absent staff can be identified and briefed separately	
	Linked to	SMS14 (audit)
	Priority	High
	Timescale	1 month and ongoing
	Cost	N/A

SMS8	**Development of Technical Standards (Infrastructure):** IÉ should review the strategy for developing 250-300 Technical Standards in Infrastructure (recommendation 1.3.1 in Raiwlay Safety Programme 2004-8) to ensure that there will be sufficient resources for preparation, briefing, implementation, monitoring and updating. Note that the specialist supporting standards development for signalling is not yet in place, which may have further impact, and that current progress and future targets suggest the goal of 250-300 targets will not be achieved. IÉ and DoT should review the implications on the allocated budget if only half of these standards are to be produced, and modify it accordingly The current target is based on the number of standards produced per annum - we would suggest that risk-based prioritisation would be more appropriate to plan the development of any Technical Standards	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

3.3.3 Monitoring

Under Company Standard 2 on Safety Monitoring, monitoring must be carried out at all levels of the organisation on a systematic basis. A monitoring programme should be based on a number of key principles:

- Pro-active monitoring is a mandatory task of all Managers and Supervisors in safety-related posts
- Appropriate time and resources must be allocated to it
- Records must be kept, so that the monitoring arrangements themselves can be audited
- Frequency of monitoring should be related to risk. The absence of accidents in an area of work does not mean however, that risks do not exist
- An interlocking hierarchy of monitoring must exist throughout each Department and across Departments, to form a comprehensive system for Iarnród Éireann as an entity
- Monitoring does not stop with observation and recording. There must be a formal follow-up procedure. Moreover, monitoring naturally involves verifying that follow-up is organised and effective

Under Standard 2, Professional Heads, Senior Managers, Managers and Supervisors are required to undertake a certain number of inspections, checks and safety tours each year. The frequency and nature of these duties must be specified on the Safety Responsibility Statements held by Managers. There is also a requirement for safety tour and inspection results to be discussed with the manager of area, recorded on an appropriate form and actions agreed with completion dates. In addition, Managers should carry an Iarnród Éireann Safety Diary/Notebook at all times to assist them with noting random good and bad safety observations and with capturing thoughts and inspiration.

As discussed above, the Operations department is generally furthest ahead with implementation of Standard 2. All locations visited had a programme for the safety tours to be undertaken by the District Manager, and all except one could show the completed monitoring programme against the plan for the previous year, 2005. In all cases, the level of monitoring and the frequency of safety tours and cab rides by the District Manager and District Traction/Traffic Executives significantly exceeded the required minimum level. The number of DTEs had also increased over the last two years in all districts visited, which has allowed the increase in frequency of monitoring and more broadly, supervision. We consider this good practice, and the evidence suggests that a strong culture of monitoring to improve safety is developing in the department.

The Infrastructure department is some way behind Operations in the implementation of Standard 2. An infrastructure standard for Safety Monitoring (I-SMS-9020) has been developed (in 2005) and appears to be a suitable translation of the Company Standard into a department specific document. However, implementation is still at an early stage. Monitoring plans were in evidence at all of the Divisional Engineers interviewed for 2006 onwards. In some places, at the time of interviewing (January 2006) some training of Inspectors in the correct application of Standard 2 and the use of new checklists was still outstanding.

The Mechanical Engineering department is further behind on implementation of Standard 2. No divisional standard for safety monitoring yet exists, and as such, we found no evidence that a programme of safety monitoring based on this standard is in place.

Review of various Safety Responsibility Statements showed that monitoring is specifically referenced. However, the exact frequency of monitoring to be undertaken by the individual was not indicated in those reviewed for this assignment.

The Standard states that the frequency of monitoring should be related to risk. All Divisional Engineers and District Managers interviewed did not specifically use outputs from the risk model for this purpose so it seems that, prioritisation of monitoring is largely based on professional judgement of the key risks in a given area of work.

Standard 2 also states that the Manager, Safety should arrange an audit of departmental monitoring systems annually, the results of which are reviewed in meeting chaired by Managing Director. We have been unable to find any evidence that these audits have occurred.

The monitoring programme is producing a large amount of valuable information on current practices which will continue, for example as implementation progresses in Infrastructure. IÉ could make more use of this information, and therefore gain more value out of the monitoring process overall, by sharing findings from monitoring activities across all departments.

Recommendations

SMS9	**Implement Standard 2 (Safety Monitoring) across all departments:** IÉ should implement Standard 2 fully across the Infrastructure and Mechanical Engineering departments over the next twelve months, and appropriate resources should be provided (if necessary) to facilitate this. In accordance with the requirements of the Standard, monitoring should be risk-based As part of the review of Standard 2, IÉ could consider reducing the bulk of the required paperwork, to ensure that the forms and checklists are appropriate for the activity being monitored The implementation of the Standard should be appropriately audited	
	Linked to	SMS10 (workshop), SMS14 (auditing), O3 (Safety Diaries)
	Priority	High
	Timescale	12 months
	Cost	N/A

SMS10	**Workshop to discuss trends emerging from implementation of Monitoring Standard:** IÉ should hold a cross-departmental workshop periodically (e.g. annually) to discuss key themes and trends emerging from the monitoring process, and look at ways to improve common weaknesses. These could be integrated with the existing system of cross-functional safety seminars These workshops should also include the audit team, both to input their findings based on the audit programme, and to help identify areas requiring a greater audit focus to bring up standards of implementation	
	Linked to	SMS9 (implementation of Standard 2), SMS14 (auditing)
	Priority	Medium
	Timescale	1 month
	Cost	N/A

3.3.4 Accident investigation

Effective investigation of railway incidents and accidents is an important element of the safety management system, providing information of the design and implantation of the system, rules and culture. Effective investigation is characterised by 'no blame', robust identification of underlying causes, timely and thorough reporting and implementation of changes to address identified causes.

IÉ is making effort to improve quality of its accident investigation and reports. Item SMS10.12 in 2004/8 Railway Safety Programme lists the funding requirement as 'improve quality of investigations and the communication of lessons learnt'. The measure planned is 'creation of central cadre of investigators' with a budget allocation of Euro 263,000. To date IÉ have appointed a Chief Investigator (a new post created in 2005) and are currently planning one additional investigator (in manpower plan) for 2006. The Chief Investigator has not yet been fully released from his previous position in IÉ, but he is already participating in, and leading some investigations, to help to improve their quality.

Standard 4, the "Standard for reporting and Investigation of Accidents and Incidents" contains many aspects that we consider to be good practice. Examples include:

- Identification of 'authorised investigators'
- Independence of investigator from department/work-group involved
- Training in accident investigation techniques for 'authorised investigators'
- Investigation depth on basis of incident potential rather than actual consequences
- Review of draft investigation reports by responsible managers before publication

In addition the Chief Investigator gives responsible managers two weeks to comment on draft reports before they are formally issued. We regard this additional step as good practice and should be incorporated into the standard at the next revision.

The Standard is at Issue 2 (December 2002) and has not been updated to refer to the Railway Safety Act 2005, the Railway Safety Commission, the Railway Incident Investigation Unit or the IÉ Safety Case. There are also no references to European accident investigation requirements that are currently being developed by the European Rail Agency.

When the Standard is revised there are a number of areas that require improvement:

- Currently there is no definition of Key terms (such as basic causes)
- There is insufficient definition of the treatment of non-IÉ parties (e.g. Enterprise services)
- There is no definition of the training/competence requirements for 'Issuing Officers'

IÉ appears to have a working accident and incident investigation process, although this is not fully aligned with the standard. Anecdotal evidence suggests that incident reporting is good, however there is recognition within IÉ that what actually happens on accident investigation is not as described in the standard. An example is that the Safety Department either Chairs or is involved in the investigation of those accidents/incidents with the highest potential, which contradicts the standard which states that Safety Department 'will not lead investigations, except in certain circumstances at the wish of Managing Director'. Apparently this has changed over past two years under the previous and current Safety Managers and therefore practice and the paper system have become misaligned.

Other examples of deviation from the Standard include:

- No training has been delivered for more than one year and therefore not all involved in leading/participating in investigations (for example the General Managers) are 'authorised investigators'. In the past, a two-day training course was delivered by a consultant who has now retired. It is also not clear if this training course had been validated as required by the standard
- Independence of investigation Chairman from activities is not always achieved

Based on a review of accident and incident reports held in the Connolly offices of the Safety and Operations Department, we consider that reports produced by the Safety Department are of an acceptable quality, but there is more room for improvement in the reports produced by Operations Division through more focus on robust identification of underlying causes.

We have the following further comments from our review, many of which are based on comparison of the IÉ reports with those prepared in Great Britain following Railway Group Standard GO/RT3473:

- Neither reports nor remits are allocated unique reference indicators/numbers
- Actual investigation remits are not always included in report
- The remit questions/headings do not drive the structure of the 'Factors for Consideration' section (an aspect that is considered to be good practice)
- Report conclusions are too conversational and need to be tightened – they would benefit from following the SMART structure
- The reports would benefit from an improved structure, such as immediate cause, underlying cases and other safety-related causes which would help to ensure greater consistency and help robust identification of underlying causes
- It is not clear that the recommendations meet the Railway Group Standard requirement (although not applicable in Ireland, may be considered good practice) 'if implemented will deliver demonstrable safety benefit

We have already arranged with Network Rail in Great Britain to provide the Chief Investigator with a copy of their Lead Investigators' Manual. Given the efforts made in Great Britain in the last 10 years to improve and professionalise railway accident investigation, there are opportunities for IÉ to share and improve its practices.

Recommendations

SMS11	**Update and implement Standard 4:** IÉ should either update the Accident Investigation Standard to reflect current practice or put measures in place to ensure current practice is aligned with the requirements of the standard During the routine review of the Accident Investigation Standard, several specific items should be improved: • References to the Railway Safety Act (2005), the Railway Safety Commission, the Railway Incident Investigation Unit and the IÉ Safety Case should be added as appropriate • The Standard should reflect European accident investigation requirements, and references added where appropriate • Key terms (such as basic causes) should be defined in the Standard rather than via a reference to another standard • The treatment of non-IÉ parties (e.g. Enterprise Services) should be defined in more detail • Training and competence requirements for "Issuing Officers" should be defined • The process for approval, implementation and tracking/monitoring of investigation recommendations should be clarified	
	Linked to	SMS3 (review Company Standards)
	Priority	High
	Timescale	Before Safety Case is issued
	Cost	N/A

SMS12	**Better define the future accident and incident investigation process:** IÉ should more clearly define the 2007 and 2008 objectives of Item SMS10.2 of the Railway Safety Programme, giving the number of investigators and investigations required against the allocated budget, and should implement this accordingly	
	Linked to	SMS13 (training)
	Priority	Medium
	Timescale	6 months
	Cost	Funded within Railway Safety Programme 2004/2008

SMS13	**Provide systematic training and coaching in investigation skills:** IÉ should provide systematic training and coaching in investigation skills and report writing (dependant on organisational structure decided for investigations and specified in revised Company Safety Standard) for all involved in the investigation process (Issuing Officers, authorised investigators, members of Safety review Group that review reports)	
	Linked to	SMS12 (defining accident investigation process)
	Priority	Medium
	Timescale	12 months
	Cost	Funded within Railway Safety Programme

3.3.5 Audit

A strong and effective audit function is a vital part of any Safety Management System, as it enables implementation at ground level to be independently checked, and areas for improvement to be identified and followed through.

For IÉ, there is widespread appreciation amongst those interviewed that audit is a key area for improvement, and that it has, and will have, an important role in further improving safety management, particularly with regard to compliance. In our view, many of the findings of this review are issues that could have been identified by IÉ, had a more effective and more comprehensive audit programme been in place.

IÉ is aware of the need to strengthen audit, and is currently in the process of doing so. Item SMS3.2 within the 2004-8 Railway Safety Programme allocates €738k over the five-year period for creation of an internal audit unit, consisting of one Lead Auditor and two other Auditors. The funding aims to develop and implement the company's existing audit capabilities. The unit will be separate from all other operational functions of the company and will report directly to the Chief Safety and Security Officer and the Managing Director. The role of the unit will be twofold:

- To audit the safety of IÉ's operations and the adequacy of their safety management systems
- To provide assurance to the company's management, the Department of Transport and the Railway Safety Commission, that the company's processes and procedures in relation to the management of safety within the company are being fully complied with

At the time of this review, an audit team is in place, but both the team and process still need strengthening. The Lead Auditor post has unfortunately been vacant since last summer and we understand that a replacement for the post has not yet been advertised. No "acting Lead Auditor" was appointed in the interim period, and as such there is a perceived lack of direction and clarity in the process of audit, and in the overall audit programme. The audit team themselves acknowledge that there is a long way to go improve the implementation and effectiveness of audit. One of the two auditors has been informally assuming the role of Lead Auditor, and a truncated programme of audits has continued in the interim period.

Despite the lack of a Lead Auditor, the audit process has recently been overhauled to try to improve effectiveness and relevance at the 'frontline'. Both auditors completed an audit training course in September 2005, run by SEQM Ltd. Following on from that training, the previous SMART (Safety Management Audit Railway Tool) audit protocol has been supplemented with an improved PAL (Personnel and Locations) audit

protocol, which is to be used for general SMS implementation audits at specific locations.

In addition, the audit process itself has apparently been strengthened, with the introduction of the principle of "Completing the Audit Circle". The process now specifically sets out findings, and categorises them according to:

- Serious non-compliance
- Minor non-compliance
- Opportunities for improvement

For each category of findings, a "Course of Action" is developed and agreed with the appropriate manager. Under the revised audit process, a system has also been put in place to track progress on each "Course of Action", and sign it off once it is complete. It is too early to see the benefits of the new process, as only a small number of audits using the new system have been completed.

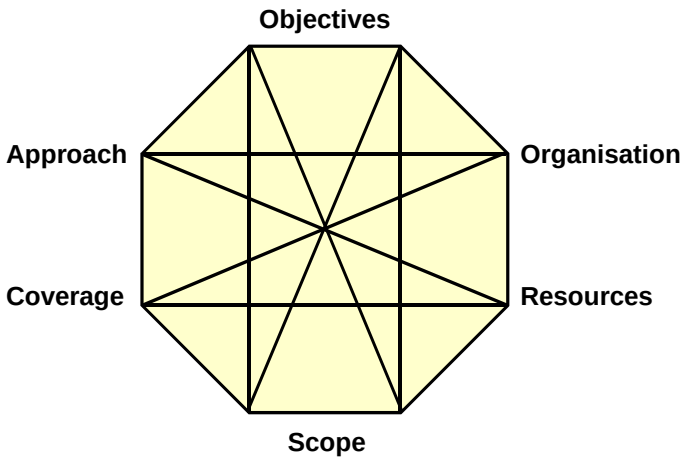
The audit programme is currently created based on a combination of specific requests from the Chief Safety and Security Officer, which relate to areas of known risk, and a regular series of location-specific general SMS implementation audits. There is a plan to move towards 'risk-based' auditing directed by the Safety Department, but it is unclear how much progress has yet been made on this, or whether the intention is to use the Network Risk Model to prioritise audit activities. A clearer audit strategy would help to address the current lack of direction.

Recommendations

SMS14	**Strengthen the audit team and process:** IÉ should strengthen the audit team and process as a matter of highest priority. Specifically, they should: • Appoint a Lead Auditor as soon as possible • Put in place a structured audit programme for the coming year, based on a sound audit strategy (which should include consideration of the key audit elements shown in Figure 2) • Move towards risk-based auditing • Ensure recommendations are tracked and signed off	
	Linked to	
	Priority	High
	Timescale	6 months
	Cost	Included within Railway Safety Programme 2004/2008

This recommendation should be considered together with SMS10, as the workshops on findings from the monitoring programme will be an important input into the planning of the audit programme.

Figure 2: Audit programme elements



Source: Strategic Safety Management Programme, Arthur D. Little

3.3.6 Competence and resources

Job Descriptions (JDs) and Safety Responsibility Statements (SRSs): Review of a number of JDs and SRSs, which clarify each individual's roles and responsibilities, including specific safety responsibilities, indicated a number of inconsistencies. It was not clear in all cases from the SRS whether a role is safety related and safety critical. In addition, the level of detail of the JDs and SRSs varied considerably, and several were not specific enough, referring to compliance with "relevant standards" without specifying to which standards it was referring, or stating that the individual "must meet the requirements of the Chief Medical Officer" without stating where those requirements were set out. The JDs and SRSs lacked evidence of a document control system, meaning it was not possible to determine which version we held, or when it was created and signed off. There was also not always a cross-reference between the JD and SRS for a particular post.

At this stage, JDs and SRSs have only been rolled out to some key staff, including the Divisional Engineers. It is understood from the interviews that JDs and SRSs have not been issued to Chief Inspectors, p-way inspectors and below, nor to all levels of operations staff with safety responsibilities. It was also noted that some HQ staff also had not received their JD/SRSs. This is not necessarily an issue, indeed in GB SRSs are not issued to all safety-critical staff. However, in the absence of a SRS, it is important that there is a robust process for competence management and assurance for all safety

critical and safety related staff, including making individuals formally aware of their safety responsibilities.

Competence management and training: At present there is no formal Competence Management system in place to identify and record competence levels or establish training requirements, although one is currently being put in place; under the Railway Safety Programme 2004-2008 a total of €771k is provided for the creation, population and implementation of a competence management database, and for the introduction of a system of personal cards which indicate an individual's competencies. In the meantime competence is generally managed less formally, with the exception of the Operations division (in which there are formal processes place for assessing and maintaining the competencies for drivers, shunters signalmen and guards), and relies largely on the knowledge and judgement of line managers when allocating work and tasks. This could become a significant risk if turnover of staff increases, or key personnel leave/retire.

The competence management system should be progressed as soon as possible, to compensate for the lack of SRSs for staff engaged in all safety critical and safety related tasks.

Communications: It was noted during the Contractors Safety Induction Course attended by the engineers supporting this review that two members of the course could not speak English and had limited comprehension of the English language, although this was the language in which the course was delivered. However, this did not prevent a certificate from being issued to them.

We consider that there should be minimum communication requirements for all IÉ staff and contractors who have to communicate with others to ensure their own, and others', safety. Without this basic standard of communication, there are serious concerns over whether they can ensure their own safety whilst on the infrastructure, as well as whether they may be placing additional risks on their colleagues, IÉ staff, the infrastructure and the travelling public.

Method Statements and Guidance Notes: Interviewees across several areas commented that there was a lack of clarity on when Method Statements were required. In P-way and in Structures, interviewees advised that safety Method Statements and risk assessments only appear to be prepared for "bigger jobs" and not for everyday activities.

In the Signalling and Telecomms area, Method Statements were found to be in place for track renewals activities where multi-disciplinary input and coordination was required. However, these Method Statements have been prepared by the Track team for their

work and do not specifically deal with SET activities. No evidence was found of inter-disciplinary consultation in developing the document or for subsequent briefings.

Method Statements appear to vary significantly in the level of detail provided. Some tend to detail the sequence of work and not deal directly with the safety issues, whilst others did address how the work would be done safely with risk assessments attached. Whilst not a key safety risk, it would help those who make use of Method Statements for them to be consistently, and appropriately, detailed.

The review was unable to find guidance on the format, requirements and approval process for Method Statements on IÉ infrastructure. Lack of control of Method Statements with respect to external parties is a particular concern, both in terms of protecting them from the railway and protecting the railway from their activities.

Recommendations

SMS15	**Clarify safety responsibilities:** IÉ should ensure that all staff who carry out safety critical and safety related tasks, are aware of their safety responsibilities. This should be delivered either through appropriate Job Descriptions/Safety Responsibility Statements (currently provided only for more senior positions), or for example through training and assessment against relevant sections of the Rule Book as part of a development of the broader Competence Management system (included in the Railway Safety Programme)	
	Linked to	
	Priority	High
	Timescale	6 months
	Cost	N/A

SMS16	**Specify communication requirements:** Specify communication requirements with respect to employment of contractors on railway sites. Specifically, the review should address communication requirements for safety courses, and for key safety personnel with respect to site safety briefings	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

SMS17	**Develop guidance notes and monitor use of Method Statements:** Develop standards and guidance notes pertaining to the use and preparation of method statements to give clear guidance on when they are required, their content and format Monitor and audit the use of Method Statements to check for compliance with standards and procedures	
	Linked to	SMS9 (monitoring), SMS14 (audit)
	Priority	Medium
	Timescale	6 months
	Cost	N/A

3.3.7 Decision making

The meeting structure (downwards from the Board and SAG, through SRG to steering groups and local meetings), although complex and time consuming, is seen by many to be a highly effective means of facilitating good safety decision-making. The minutes generally show that safety issues are discussed and dealt with as high priority and cascade through the layers of meetings.

When asked, many people perceive that decision-making is based on professional judgement, and that increasing the extent to which decisions are risk-based is some way off. There are examples, however, of where risk-based safety management activities are being carried out. For example, at the highest level the Network Risk Model was used in helping to support development of the 2004-2008 Railway Safety Programme, in particular identifying intolerable risks on three lines of route, which have since been rectified. The same Model has had some application in cost-benefit analyses, although to date this has been limited. IÉ have had a quantitative level crossing risk model since 1997, which has been used to risk assess all level crossings on the network, and to bid for investment for closures and upgrades to the highest risk crossings.

IÉ are planning for the Network Risk Model to be enhanced to facilitate more risk-based decision-making by providing an improved user front end and programmes of training, although we have some reservations about whether simpler and more specific tools might serve this need at lower cost, and more effectively (see section 3.6 and recommendation NRM1).

IÉ's overall risk management framework is to ensure that risks are managed to a level that is ALARP. However, when asked, many managers were not sure how all safety issues were considered against ALARP criteria, other than applying professional judgement. This is an aspect that should be an underpinning component of the Safety Case, and may require enhancing the competence of managers through suitable risk assessment training (see recommendation NRM2).

Recommendations

No additional recommendations – refer to section 3.6.5 recommendations NRM1 and NRM2.

3.4 Safety case preparation

Under the Railway Safety Act, which came into force on 1 January 2006, IÉ are required to:

> "…implement safety management systems and to describe, in a document called the "safety case", how they manage safety in all of their activities, including the identification of risks arising from such activities and the measures in place to mitigate and manage those risks."

The Act also lists the minimum components of the safety case as:

- A description of the operations of the railway undertaking
- A statement of its safety objectives
- Identification of risks arising from the operation of the railway and the means by which they are being mitigated
- The management and organisational arrangements in place for the management of safety
- Arrangements for monitoring, auditing and reviewing the safety case

The Act specifically states that in preparing a safety case, "a railway undertaking is required to consult with its staff and staff representatives." The Safety Case must be submitted within 6 months of Part 4 of the Act coming into force (March 2006).

The IÉ safety case is currently being drafted. The approach has been to keep the document very high level (consistent in principle with the direction from the Interim Railway Safety Commission), referencing standards, the Rule Book, various safety plans, and other aspects of the safety management system.

The safety case has been developed centrally by the Safety Case Manager in the Safety Department and is said to be "80% complete". The IÉ Safety Case Manager has set out a programme of activities taking the Case from its current draft, through to submission in September 2006. This will involve activities such as briefing to Senior Management, internal approval from all departments, and independent assessment.

It is considered to be good practice to prepare a safety case with significant input from those line managers and workforce safety representatives who will have responsibility for delivering against the safety management system, and other aspects of the safety case, such as the safety plan. In Great Britain, the HSE expects that workforce consultation goes far beyond a briefing-based approach. In this respect, because IÉ's safety case has to date been developed centrally without significant input from line management, the briefings and reviews that are planned over the coming months, will be critically important for its acceptance and buy-in.

This review has not included a review of the current draft of the safety case, although we give a perspective on what we would expect to see in the safety case, considering current 'good practice' (with respect to GB), and the broader findings of this review:

- IÉ has made significant improvements to the management of safety, although as mentioned throughout this report, still has some way to go in achieving complete and more formal implementation across the entirety of its Safety Management System. We would therefore suggest that the safety case document should highlight clearly those areas that are 'goals' or objectives to distinguish them from current actual practice. This relates to 'planning' which is a particularly useful feature of a safety case, as it helps to clarify the current expected standard now, and how current weaknesses would be addressed
- The risk assessment section of the safety case will be based primarily on the results of the Network Risk Model, which has been updated recently (see section 3.6). This will usefully provide a basis for focusing safety priorities (i.e. demonstrate a 'risk – based' approach to safety management)

There is recognition with IÉ that all ten Company Safety Standards should be revised before the completion of the safety case as these standards form the backbone of the Safety Management System. However, it was also commented to us separately that this might be unrealistic in terms of the resources available, and that it would be unwise to rush the review and not take into account the comments highlighted in this work. IÉ need to resolve this issue, and clarify exactly when and how the review of the Company Standards will take place (see recommendation SMS3).

Recommendations

No specific recommendations are made here; see also section 2.1.7 regarding safety case guidelines, and recommendation SMS3 on updating the Company Standards.

3.5 Safety culture

It was commented to us by a range of individuals interviewed that over the last two to three years, significant efforts by some individuals have led to improvements in safety culture, and greater consultation with the work force. Specific initiatives aiming to improve safety culture/performance which were cited include:

- Development of the Professional Driver's Handbook and the Professional Signalman's Handbook
- Development of a Shunters Handbook
- Implementation of Shunting and SPAD focus groups
- Introduction of an Operations Safety Plan (which we consider to be best practice)
- Creation of "Work Instructions"
- Many initiatives which have originated at a local level, such as "The Professional Shunter" presentation, Local Instructions for Shunters for specific locations (e.g. Limerick Station and yard)

It is interesting to note that many of these initiatives were led by Safety Managers, rather than those with formal line management responsibility and accountability for safety. Senior safety leadership is generally perceived to be good, and is reported to be particularly strong in Infrastructure. The appointment of the General Managers is perceived to have had a generally positive impact on the running of the railway, and their role in promoting safety is clear. A key aspect of this is the weekly meetings between the General Managers and the CEO (with the Chief Safety and Security Officer present) on which safety is a key agenda item.

Another key feature mentioned by some Divisional Infrastructure managers, is that the General Managers provide a 'healthy' focus on keeping the railway running, which can have a positive impact on safety. For example, there is apparently a greater emphasis than before on removing speed restrictions to restore normal train running, which can mean that any work to bring track up to standard is carried out more urgently. Looking forward, it is critical that the authority for deciding on the setting and lifting of speed restrictions remains firmly with those responsible for infrastructure (i.e. the Chief Engineer and his team) to avoid any potential conflict between safety and service.

Further down the organisation, Safety Representatives and Safety Liaison Executives are generally seen to make positive contributions to implementation of safety management nearer to the ground. The ratio of DTE's to drivers has also been increased which should mean increased levels of supervision, and reinforcement of implementation of the SMS and applicable Standards. There remain a number of vacancies, however, amongst the Safety Liaison posts.

When asked, many people recognise that compliance at the workforce level continues to be one of the main challenges in strengthening safety performance. This issue is consistent with many of the findings highlighted through this report, which relate to shortfalls in implementation of formal systems. It was suggested by some of those interviewed that the safety culture on the ground is still largely "informal" (relies on experience and "gut feel" rather than what is formally specified), but it was equally clear that interviewees did not feel that unsafe practices were routine. Comments included:

- *"the SMS is understood at supervisor level but practices are still informal on the ground"*
- *"there is a good understanding of safety at the front-line, it just may not link to the SMS"*

One view we have heard is that the rules may not be followed due to "embarrassment", for example:

- Use of the phonetic alphabet is seen as 'good practice' rather that mandatory, but is apparently rarely used in practice
- One interviewee told us that staff/site briefings are not always done correctly as the group are familiar with one another and the tasks at hand

Clearly these are only anecdotes and need to be regarded in this context, and we have not been able to determine through this review whether such practices are isolated or widespread.

We have also heard several examples of where there are routine violations of the rules due to constraints of resource or competence, or due to a perceived impracticality of the requirements:

- There is apparently a persistence of rostering signalling maintenance staff to work alone at night, which apparently goes against a rule requirement for work to be undertaken with a Track Safety Coordinator (TSC) (see also sections 3.8 and 3.10 on p-way and signalling and telecomms)
- The required frequency of monitoring of shunters was impossible to achieve in some cases due to the significant reduction in shunting operations

- Limits on resources mean that it is not possible to check level crossing gatekeepers as frequently as is required by the SMS

The above examples, together with more general opinion from the interviews, indicates that compliance with the safety management system is a key area for improvement. It also suggests that the "review" step[3] in the management of safety is lacking, which highlights the importance of effective supervision, monitoring and audit (see section 3.3.3 and 3.3.5).

IÉ have a budget (around €100k per year) for an annual safety culture survey within the Railway Safety Programme 2004-2008. The most recent survey comprised of a repeat of a 'culture questionnaire' issued to staff to solicit opinions on the effectiveness of safety management, and perceptions that relate to safety culture. Such surveys can be a useful 'barometer' for safety culture, but alone cannot always uncover the root causes of any potential cultural weaknesses. It is important that the results of the survey are used to inform management action or, for example, to carry out more in depth investigations of any potential concerns emerging from the survey. The budget allocated would seem high for carrying out a straightforward repeat of a questionnaire, and so should be either reviewed, or the budget used to deliver a more extensive initiative to drive cultural improvements (see section 3.3.2 and recommendation SMS1).

Drugs and alcohol: Under the Railway Safety Act 2005 parts 9 and 10, IÉ are required to implement a system of random drug and alcohol screening, and progress is apparently being made with this. The Act provides for a six month period from May 1, 2006 for consultation activity before this is put in place, and IÉ have stated they intend to comply with this timeframe.

Meanwhile, there is no such system and as such the issue of drugs and alcohol use emerged several times during the review. It was noted as a concern that while 40% of those who come forward for recruitment are screened out because of drugs and alcohol, random screening of staff is not currently allowed, even those in safety critical posts. Currently, screening is only allowed after an accident or incident. IÉ does, however, have a drugs and alcohol intervention and support system whereby staff who are identified as being at risk are treated by the Chief Medical Officer. It was also commented that actual detection is more likely through personal supervisor awareness, such as is found where drivers and other staff are monitored at booking-on points.

Specifically in Mechanical Engineering, it emerged that Depot Managers were aware of the impact of drugs and alcohol but seemed unsure of any clear screening policy and its

[3] A widely recognised principle of effective safety management, including that within IÉ's safety management system, is continual "review" to ensure that the system is being effectively delivered, and where not, used to identify improvements.

application to staff. Most considered that current drugs and alcohol screening policy applies to medicals and special referrals where individuals were considered to have a problem, and any referral requires the examination of the IÉ Medical Officer who is not obliged to give the results to depot managers. Under current policy, the individual concerned and the medical officer, in conjunction with the line manager, may agree that work may be resumed to a given programme, but some managers felt this consultation did not always take place.

The current situation poses a significant risk to the safe welfare of staff and to the safe operation of traction and rolling stock, since an individual who wished to consume prohibited levels of drugs or alcohol could do so with a low likelihood of detection. In addition, denying depot managers the results and inclusion in the decision making process as to whether the individual can resume activities is a serious flaw in the current system.

CARA: IÉ's confidential accident reporting mechanism, CARA, has not yet been rolled out in P-Way, which significantly limits the value that the system can deliver. In addition, the progress report for Parts A and C of the Railway Safety Programme 2004-2008, indicates that only 15 cases were reported to CARA during 2005, suggesting that the lack of awareness of CARA is more widespread. IÉ have acknowledged the low level of awareness of CARA and are apparently planning to address this through the "Don't Walk On By" campaign.

Accident and incident reporting: It was commented several times during the interviews that there is apparent inconsistency in the treatment of "near-miss" incidents. They are not routinely recorded in all cases, and are therefore not included in the incident investigation process. This means a potentially valuable source of information on root causes of incidents, and areas of risk is being missed.

Recommendations

CL1	**The RSC should focus on ground level compliance at first:** Given that there are acknowledged shortfalls in compliance with the SMS at ground level, the RSC should focus their attention in the first 6-12 months on a number of key issues related to implementation at ground level: • Audit plan and implementation • Implementation of Standard 2 (Monitoring) across all departments • Safety briefings • Competence management • Role of Track Safety Coordinators and Lookouts	
	Linked to	SMS9 (Monitoring Standard)

		SMS14 (audit) SMS7 (safety briefings) SMS15 (competence management) PW1 (TSC) ST1 (lookouts)
	Priority	High
	Timescale	6 months and ongoing
	Cost	N/A

CL2	**Drugs and alcohol policy:** IÉ should implement a new company policy for drugs and alcohol screening, including random and selective testing and appropriate consultation with staff, in line with the requirements of the Railway Safety Act	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

CL3	**Raise Awareness of CARA:** Raise the general awareness of CARA and encourage staff to use it. This could be tied into the "Don't Walk On By" campaign	
	Linked to	
	Priority	Low
	Timescale	6 months
	Cost	N/A

CL4	**Recording of "near-misses":** IÉ should re-brief all staff on the requirement to record all "near-miss" incidents, and follow up through the internal monitoring and audit functions that this is being complied with	
	Linked to	SMS9 (monitoring), SMS14 (audit)
	Priority	Medium
	Timescale	6 months
	Cost	N/A

No specific recommendations are made on IÉ for further developing a culture that is supportive of safety. However, a number of recommendations made in other sections of this report will address some of the shortfalls in safety management that impact on culture:

- Addressing issue of providing lookouts (ST1)
- Addressing issue associated with provision of Track Safety Coordinator (PW1)

- Improved safety briefings (SMS7)
- Full implementation of the Monitoring Standard (SMS9)
- Strengthened audit capability and process (SMS14)
- Review of Company Standards to ensure that they are implemented as intended, or revised (SMS3)
- Reviewing the plan for producing a very large number of infrastructure standards (SMS8)

A common theme is improving compliance (through briefing, monitoring, audit and simplified standards, and continued efforts to strengthen supervision).
Key aspects of a strong safety culture are 'leading by example' and 'senior management commitment'. These are highly relevant to IÉ, both *specifically* through implementation of the Monitoring Standard (which cascades from the Chief Executive's safety tours downwards) and safety briefings (again, these cascade through all levels of the company), and *generally* in terms of providing funding and resources, and continuing to place safety as the highest priority item in all aspects of business decisions.

3.6 Network Risk Model

3.6.1 Current level of risk

The IÉ Risk Model has been developed to provide a quantified estimate of the risk to passengers, trespassers, other members of the public and staff on the IÉ network. The Model was used in 2003 to help to underpin the Railway Safety Programme 2004-2008, and at that time the model estimated a total risk factor of 17.5[4] (Figure 3).

Figure 3: Level of risk as reported by Risk Model 2003

Exposed Group	Risk Factor (2003)
Passengers	10.3
Trespassers	1.6
Other public	3
Staff	2.6
Total	***17.5***[5]

Source: Railway Safety Programme 2004-2008, Iarnród Éireann

[4] The output of the Model is expressed as 'risk factor' which is measured in accidental fatalities and weighted injuries per year

[5] Suicides are excluded from the Risk Model

During the time of this review, the Model was in the process of being updated for 2005, reflecting changes in a number of areas:

- Updating system parameters such as timetabling, train miles and passenger numbers
- Improvements in safety performance relating to the condition of assets
- Incorporating more recent (2004) accident data
- Calibration against improved Synergi data
- Use of certain data from the GB Safety Risk Model, where data from IÉ is too limited (typically due to the smaller scale of operations and lack of relevant data)
- Addressing items in the Issues Log
- Changing the basis of the Model from Functional Locations to Sectors

As a result of these changes, which it must be noted were still ongoing at the time of this study, the risk is estimated to have reduced in comparison to that estimated in 2003. The latest figures available for this review estimate that the risk factor for 2005 is around 11.3 (a reduction of about 6, or 35%, compared with the 2003 estimate).

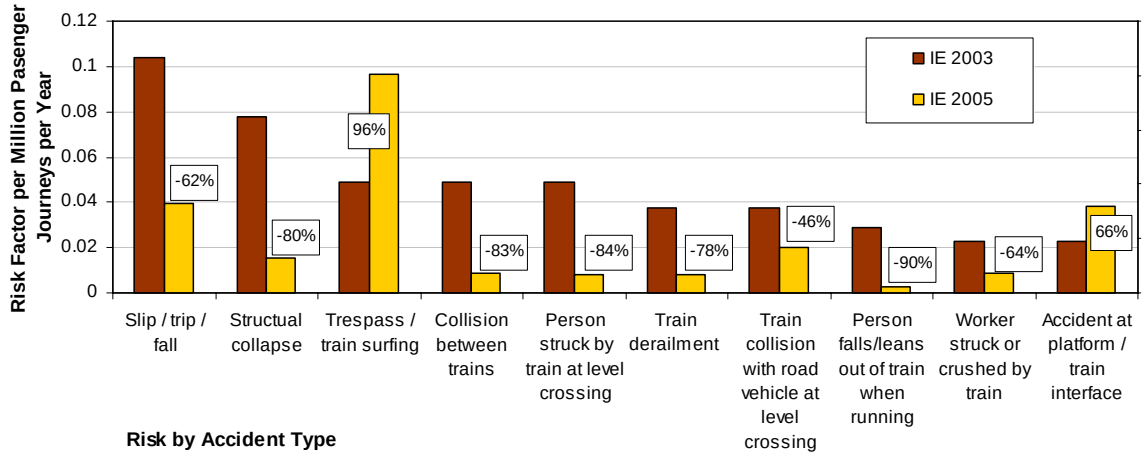
The allocation of the change in risk is as follows:

- Of particular interest, the improved condition of assets is estimated to account for around one-quarter of the total risk reduction (-1.5).
- Changing the Model basis from Functional Locations to Sectors increased the estimated risk (+1.3)
- All other changes reduced the estimated risk:
  - Calibration (-2.4)
  - Updating incident and accident data (-1.9), including a significant reduction in the number of potentially high severity signals passed at danger
  - 2005 timetable and usage (-0.4) due largely to changed rolling stock utilisation across the network
  - Dealing with items in the Issues Log (-1.3)

The highest risks by asset category are shown in Figure 4, highlighting some significant differences for some assets (the overlaid figures show the % increase or decrease from 2003 to 2005). Some of the differences between the 2003 and 2005 Model are due to improvement in asset condition and replacement of ageing assets. For example, replacement of slam door rolling stock has had a positive impact on the risks related to the train / platform interface, persons leaning out of the train window, and to some extent the risks of train collision and derailment. Elsewhere, many of the differences are attributed to refinement of the Model, updated system information (timetables, passenger loading, etc) calibration and addressing items in the Issues Log.

There is a view amongst those interviewed for this study that the current and ongoing improvements to the Model are producing results that are more closely aligned with actual safety performance of the railway than the 2003 results. This is typical of such risk assessment models, which move towards less cautious estimates as refinements are made.

Figure 4: Network risk model: key risks 2003 versus 2005



Source: Analysis of data provided by IÉ

Nevertheless, there is a significant change in the estimated risk (2003 to 2005) in some areas, which highlights the inherent difficulty in developing Models of this type, particularly for a railway such as IÉ, where there is relatively little accident data. As such, at the time of conducting this study it is not clear the extent to which the latest results have reached a stage where they can be regarded as highly robust, or whether additional refinement would further reduce the predicted risk. We therefore support IÉ's plans to carry out further benchmarking of the Model results, and in house review in a series of workshops.

The current work to refine the Model appears to be making the results more robust, but it will be important for all concerned parties to gain further confidence in the results of the Model before it is used to help support any future railway investment plans. Specifically, prior to reconvening the Task Force to propose funding for the third phase of the Railway Safety Programme (2009-2013), all parties concerned (DoT, IÉ and the RSC) will need to be assured that the level of risk predicted is reasonable and robust. This could include, for example, validation of the results of the Model with actual safety losses (in accidental fatalities and weighted injuries), and more transparent uncertainty and sensitivity analysis.

3.6.2 Use of the Network Risk Model

The Network Risk Model to date has been mainly used for high-level support of the Railway Safety Programme 2004-2008, in which a number of the most significant contributors to risk were usefully highlighted (SPADs, shunting, possession management, level crossings, slips, trips and falls, and manual handling). Since being identified by the Model, IÉ have focused management action on these specific areas, and already report improvements. Of particular note, the application of the Model prior to the 2004-2008 Safety Programme identified three routes with 'intolerable risk' (primarily due to aged rolling stock), which were therefore addressed as a mater of urgency. It was the view of several of those interviewed that without the Risk Model, it would not have been known that the individual risks on these routes were at such a high level.

A small number of cost-benefit analyses have also been completed (including Heuston Station roof, provision of GSM-R and bridge protection). Some Divisional Engineers and Buildings and Facilities Manager also report having used the Model in discussion with the Chief Engineer to help to determine programme and budget priorities as part of the annual planning process. The Model is also being used to help specify and reconfigure the new accident and incident management system (Synergi).

Many of those interviewed for this study have not yet had significant dealings with the Risk Model but comment that the results confirm what they know about risk already, perhaps reflecting the fact that initial development of the model comprised of workshops in which engineers estimated key base inputs into the Model. Further down the command chain, interviews revealed that there is currently confusion over its purpose, although it must be noted that it has yet to be rolled-out to this level of the organisation. There was also some confusion over the scope and purpose of different risk models, registers and other risk management systems, and when the existing system is to be formally replaced by the new systems.

Going forward, it is also expected that the revised (2005) results will form a key section of the Railway Safety Case, helping to underpin IÉ's safety plan on the basis of risk (see section 3.4).

The development of the Model, and application for the cost-benefit analyses, has been carried out by external consultants. Oversight and interface with the consultant is provided by the IÉ Safety Performance Manager. He has recently, for example, been working on providing results for the Safety Case, and managing the programme of updates and improvements to the model (to be delivered by the consultant). The Assistant Chief Engineer (Infrastructure) has also had an interface with the Model, through his development and delivery of the IAMS project; this project has redeveloped the Asset Ratings that feed into the Model.

The level of technical understanding of the Model within IÉ is currently limited, and when interviewed, most people have a perspective that the Model has been useful at very high level for helping to support the Safety Programme, but that it doesn't feature yet in more tactical decision-making. A briefing has been delivered to Senior Managers (and the Railway Safety Commission and Department), although this was an overview to give a basic awareness of the Model rather than a training course. (IE recognise the need for improved understanding and ownership and this is reflected in its plans. See section 3.6.3 below for details).

3.6.3 Planned developments

The 2004 –2008 Railway Safety Programme allocates some €1.2m over five years for a range of developments to the risk model including work on the user interface, and improvements to monitoring, communication and management of incident data. For 2006 to 2007, IÉ have defined the objectives of the Model development as including enhancing the user front-end, enhancing the risk Model by incorporating safety management system, human performance aspects, enhanced asset information, integration with new Synergi, and development of business cases. Looking forward to 2008, IÉ plan to take the Model to individual assets, inclusion of safety management ratings, and installation on the IÉ intranet.

IÉ recognise the need for improved ownership and training in the Model, and this is reflected in its plans, which have been approved by the Board. These include further enhancing of the user front end, specific training, risk assessment training for middle manager and technical posts, and roll-out. It is also acknowledged that a small, dedicated team will be required for the ongoing data management, running, upgrading, calibration etc.

IÉ consider that a particularly important part of the Model's development is better integration with an improved Synergi system, which will aim to address previous shortfalls in reliable and robust precursor data. Completion of the Synergi project should mean that the Model becomes more robust, as better precursor data should be available, and less judgement will be required to populate the Risk Model.

Additional plans include further breakdown of the Model into individual assets (rather than sectors), and expanding the Model to incorporate elements of safety management systems, human performance and asset information enhancement. Whilst in principle these may further help to improve the robustness and detail of the Model, there is also the risk that these will further complicate the model and create a greater barrier to IÉ developing a full understanding of the Model, and being able to take it's future development, support and management in-house. The Model is already highly complex,

and so the potential difficulties associated with further investment in greater levels of sophistication should be carefully considered. In contrast to this, some managers who are involved in more day-to-day decisions regard the Model as not being useful because it is not detailed enough in its treatment of assets and asset condition. Some such managers have used simpler and more specific risk tools to support risk assessments, but have yet to be fully involved with the Network Risk Model.

Prior to further developing the sophistication of the Risk Model, consideration should be given to the broader range of options available for asset specific risk tools. There is some benefit in having a single Network Risk Model for all types of assets, as this means that only one Model needs to be maintained. Also, the Task Force required IÉ to develop a model that allowed risks to be assessed comparatively across all areas of operations to ensure values for money could be fairly assessed in the second phase of the investment programme. However, having simpler, more tactical risk tools specific to the area of risk (e.g. fencing, level crossings, etc), may be advantageous from the perspective of those developing, using, updating, and calibrating the tools. For example, IÉ have a level crossing model that has been used at Divisional Engineer level in support of decision-making at the appropriate level, and the value of integrating this into the global Network Risk Model would need to be evaluated. Indeed, as a comparison, in GB specific models and tools are used in addition to the global (Safety Risk Model), to enable managers with specific responsibilities to assess risk and support the relevant business cases for investment. Notable examples include a level crossing risk model, road vehicle incursion tool, and models for layout (SPAD-related collision) risk.

3.6.4 Asset rating

The system for asset rating (being progressed through the IAMS project) has varying degrees of buy-in at different levels in the organisation, reflecting the fact that roll-out of any such system takes time before it can be fully embedded. Whilst most of the 30,000 assets have apparently been rated, there is some opinion that the Network Risk Model is not currently a useful tool at the working level, for three main reasons:

- Some feel that the asset ratings are too subjective, and application can suffer from inconsistency and repeatability, despite the advice given by Asset Rating Guidance documents, and briefings that have been given. For example, it is not clear that a bridge rated by an individual in Athlone will correspond with one rated by a colleague in Dublin
- Another opinion is that the asset ratings are too generic, i.e. not specific enough for the asset being rated. For example, the rating of assets related to buildings and facilities is quite different from infrastructure assets

- A third issue is the perception that the ratings are not meaningful for the relatively small number of large and complex assets as there are too few ratings to adequately differentiate those features that are either poor or very good. As such there is a view that the rating system does not help with the effective safety management of such assets, as it cannot readily identify specific risks that require urgent or prioritised attention

The asset rating system currently co-exists with older systems (paper based) that are currently preferred by the engineers using them, for the reasons cited above. Importantly, the manager of the IAMS project is aware of this and accepts that the system will take time to fully implement (this has been the experience of other European railways who have implemented similar systems).

3.6.5 Comparison to GB Model

Comparison of risk models between different railways is difficult, and it is important to be cautious when interpreting the results of such a comparison. In particular, the risk predicted by each model has to be normalised to account for differences in the scale of operation. Even when normalised, a direct comparison is difficult since there are differences in the nature of operations, infrastructure, rolling stock etc.

Nevertheless, we compare here the results of the IÉ Model with those of the GB Safety Risk Model[6] (SRM) for Network Rail's infrastructure, since the railway in GB has many similarities with that of IÉ (in terms of standards and Rules).

The GB SRM predicts a risk factor of 191.1 compared with the figure of 11.3 for the 2005 IÉ Model (noting that the figure for the 2005 IÉ Model is subject to some further work). Of course, the GB mainline railway is a much larger network carrying 1.09 billion passenger journeys compared with 34.6 million passenger journeys on IÉ's network. A comparison of risk normalised by passenger journeys shows that overall the IÉ Model estimates a risk that is around 1.9 times higher than that estimated by the GB Safety Risk Model, which may not be unreasonable given the differences in the nature of operations between the two railways and in the inherent difficulty with normalisation and comparison of different models. It should be noted that the update of the IÉ Model from 2003 to 2005 (see section 3.6.1) brings the results overall closer to the level estimated by the GB Safety Risk Model.

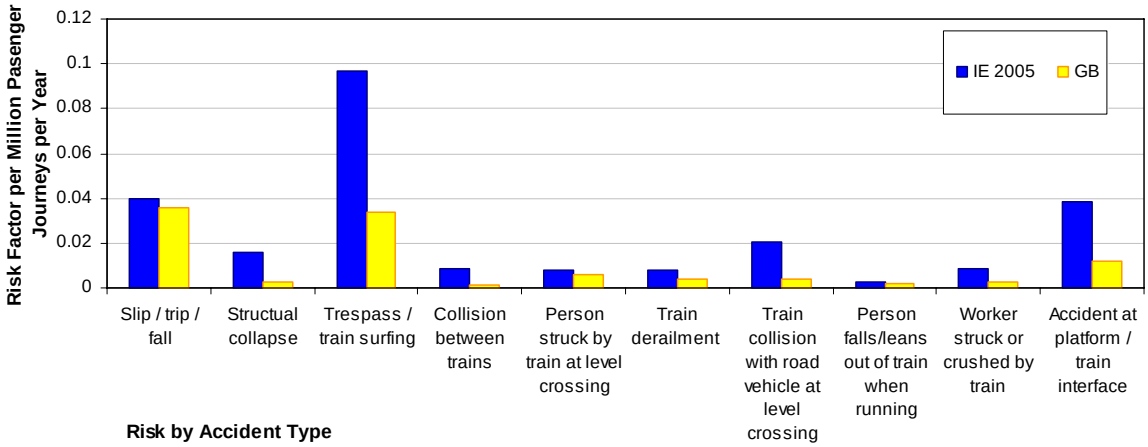
Figure 5 shows a breakdown of risk (again normalised by million passenger journeys) for the 2005 IÉ Model and the GB Safety Risk Model[7]. The results show that the IÉ

[6] Current Version 4.0

[7] In some cases it has been necessary to estimate how an accident type report by the Iarnród Éireann risk model 'maps' to an accident type in the RSSB's SRM

Model is comparable for most accident types to the equivalent estimated in GB. Structural collapse, train collisions, trespass/surfing, collisions at level crossings, and accidents at platforms are predicted to be higher. The difference in risk relating to collision between trains may be partially due to the fact that although rail traffic densities are lower in Ireland than in GB (which will have the effect of reducing the risk) the GB network is provided with Train Protection and Warning System (TPWS).

Figure 5: Comparison of IÉ and GB Risk Models by accident type



Source: Rail Safety and Standards Board Safety Risk Model – Risk Profile Bulletin 4 and Iarnród Éireann "Railway Safety Programme 2004-2008

Recommendations

NRM1	**Development of Network Risk Model:** Development of Network Risk Model: Prior to reconvening the Task Force to propose funding for the third phase of the Railway Safety Programme (2009-2013), all parties concerned (DoT, IÉ and the RSC) will need to be assured that the level of risk predicted is reasonable and robust. The imminent work to benchmark and validate the results of the Model, and the review workshops that are planned could provide a key input to this process. Prior to further development of the Risk Model, IÉ (working with DoT and the RSC) should review requirements to ensure that the Model does not become overly complex for its intended use, and for the eventual handover of the management of the Model in-house. This should include consideration of how best to develop improved asset -specific risk modelling capabilities. An alternative to extending the asset modelling capabilities of the Network Risk Model would be to develop more straightforward and specific tools that might be more simply integrated into IÉ's decision-making processes, and which coexist alongside the Network Risk Model.	
	Linked to	NRM2
	Priority	High (because decision needs to be made before funding committed)
	Timescale	3 months for review and agreement of Model requirements (not including the development of the Model(s) themselves)
	Cost	Within existing budget of Railway Safety Programme

NRM2	**Develop in-house competence in Risk Model:** IÉ should plan for moving the Model 'in-house' to facilitate greater ownership and understanding of the Model. This may require broader training in risk assessment for staff who are to use the Model to help with decision-making, and should be considered in the skills required for any recruitment of staff to support the Risk Model	
	Linked to	NRM1
	Priority	Medium and ongoing
	Timescale	6 months
	Cost	Within existing budget of Railway Safety Programme

NRM3	**Review Asset Rating Guidance:** IÉ should review the Asset Rating system, including its interpretation by different individuals, to assess what additional measures may be required to improve consistency in application. Depending on the results of the review, this could result in improved training and guidance in asset rating, central checking of ratings provided by engineers in the field, or revision to the Asset Rating system	
	Linked to	
	Priority	Medium
	Timescale	6 months and ongoing
	Cost	N/A

3.7 Operations

Three General Managers (GM), for North and East, South and West, and the DART oversee the operation of the railway. The General Managers report directly to the Chief Executive, and each GM has one or more District Managers reporting to him, responsible for operations in a particular area. This is recent change, following the promotion of the Chief Operating Officer, to whom the General Managers originally reported, to Chief Executive. Reporting to the District Managers are local Station Managers, District Traffic and Traction Executives (DTEs), a Safety Liaison Executive, and the drivers for their District.

The Railway Safety Programme 2004-2008 contains 14 recommendations specifically for operations (all in Part C 'Human Performance'), with a budget of some €23m. Issues covered include training, competence assurance, annual emergency response exercise, safety management facilitation and specific items for drivers, guards, station staff, signallers and shunters. IÉ report progress on all 14 items in their monthly tracking of the Railway Safety Programme.

3.7.1 Occupational/workplace safety

Shunting competency: Shunting continues to be one of the areas of highest risk to IÉ employees in day-to-day operations, particularly because it is an area where accidents are often very serious, something which is consistent with most other railways. IÉ have put significant and appropriate effort into reducing shunter risk through initiatives such as the creation of a Shunting Focus Group, the introduction of the Shunters' Handbook, and Professional Shunting training courses and interactive presentations. Around €62k is outlined per year in the Railway Safety Programme, a total of nearly €300k over the five years.

In recent years, the frequency of shunting movements has decreased considerably with the increasing use of railcars, the removal of slam-door rolling stock and the reduction in freight traffic. The frequency of shunting will decrease further with the introduction of Mark 4 stock later in 2006. This reduction in frequency may actually have some adverse impact on the risk associated with shunting, as staff may be qualified as competent shunters, but spend most of their time on other duties, and will also reduce the opportunities for monitoring of shunting operations. Staff will still be required to maintain competency through annual refresher training, but may undertake very few shunting operations during the year.

Mobile phone use: We understand that the current regulations with regard to mobile phone use by drivers is that their use is prohibited while the train is moving, and that company issued mobile telephones must only be switched on and used if essential to the safe delivery of the work in hand and part of a safe system of work.

Based on the comments of one interviewee, this policy may not be fully understood, but there was no firm evidence to back this up. It was also commented that there might be good opportunities to use mobile phones to increase safety, for example removing the need for a driver to leave the cab and use a lineside telephone to call a signalman, but the policy on this was unclear.

Recommendations

O1	**Review mobile phone use regulations:** IÉ should review the regulations regarding the use of mobile phones by train drivers, and consider allowing their use in specific situations if it is concluded that this would result in reduced overall risk The use of mobile phones by drivers is a current area of debate in the UK, so IÉ may be able to benefit from the outputs of any research in this area	
	Linked to	
	Priority	Medium
	Timescale	12 months
	Cost	N/A

3.7.2 Documentation

Safety Statements: Safety Statements are documents designed to assess the hazards of a specific location, and set out measures for mitigating risks, dealing with emergencies etc. for that location. They are based around a common framework, which is distributed to each location, and which should then be made specific to that location through a series of local risk assessments.

In several locations it was evident that the Safety Statement had not been properly adapted for the location; local hazards had not been identified, risk assessments had not been completed, and all local information had not been included (names and contacts of key staff etc.). This was reinforced by comments from several interviewees who reported that Safety Statements were often not specific to the location, and had simply been filed when the framework document had been received.

Safety diaries: Safety diaries form part of the requirements of the Monitoring Standard. District Managers should carry them, and record safety tours completed, and any findings noted. Based on the interviews completed, it would appear their use is variable.

Some were fully up-to-date, with a number of tours already completed in 2006 whilst in others, the most recent entry was for January 2005.

Recommendations

O2	**Improve Safety Statements by making them specific to location:** The Safety Department should brief all staff on the requirement to update the Safety Statement to make it relevant to the location. Compliance with this requirement should then be confirmed through the internal audit process	
	Linked to	SMS14 (audit)
	Priority	Medium
	Timescale	6 months
	Cost	N/A

O3	**Rebrief staff on requirement to use Safety Diaries:** IÉ should re-brief relevant staff on the requirement to use Safety Diaries to record Safety Tours. Compliance with this requirement should then be confirmed through the internal audit and monitoring process	
	Linked to	SMS9 (Monitoring Standard), SMS14 (audit)
	Priority	Medium
	Timescale	3 months
	Cost	N/A

3.7.3 Organisation and management

Training: Several interviewees stated that there is a current shortage of trainers at Inchicore to undertake routine refresher training, as a result of the ongoing programme to train drivers for the new Mark 4 stock. As a result, some routine refresher training is being undertaken by local DTEs, which removes them from their principal role of driver supervision. While the shortage of trainers due to the Mark 4 training is short term, there was concern raised that this might happen more regularly in future, particularly with the planned increases in train frequency on some lines and the consequential requirement for more qualified drivers.

An additional concern raised around training was that staff can currently be taken out of training to cover staffing shortages in other areas. This can lead to training schedules being heavily disrupted, particularly at times of year when many staff take annual leave, and this disruption may reduce the effectiveness of the training. It also means that the courses take longer to complete.

Recommendations

O4	**Review the number of trainers required at Inchicore:** The Manager Training should re-assess the number of trainers required at Inchicore, in view of training requirements forecast over the coming year, and should consider increasing the pool of trainers	
	Linked to	
	Priority	Medium
	Timescale	3 months
	Cost	N/A

O5	**Secure training attendance:** IÉ should ensure that staff are not removed from training to cover staff shortages elsewhere – this has been implemented locally in some areas, and should become a company wide requirement	
	Linked to	
	Priority	Medium
	Timescale	3 months
	Cost	N/A

3.7.4 Recruitment and resources

Consequential vacancies: IÉ have a policy to recruit externally at the base level, for depot staff, and then recruit internally for almost all other posts. Several interviewees raised concerns regarding consequential vacancies that arise from this internal recruitment process. When staff are recruited to become guards, drivers etc. their previous post has to be held open for 6 months to allow them to return to it should they not fit into the new role. This means the pool of staff to recruit from is always short of people, reducing the availability of high quality staff to recruit. With the increasing demand for drivers, given the increase in train frequency, it was suggested that this problem is likely to get worse, and may mean that the minimum standards for driver recruitment may have to change.

O6	**Address consequential vacancies:** IÉ should review the recruitment process at the base level, to ensure that a suitable pool of candidates are available to recruit high quality train drivers in all areas of the network.	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

3.8 Permanent Way

Within each Division, a Divisional Engineer (DE) is responsible for the fixed infrastructure with support from two Assistant Divisional Engineers (ADEs). The Chief (PW) Inspector also reports directly to the Divisional Engineer. Reporting to the Chief Inspector are Permanent Way Inspectors, supported by teams of technicians and gangers. Standards and professional head support are provided by HQ at Dublin. The Divisional Engineers report to the Chief Engineer Infrastructure.

As a result of the substantial investment through the Railway Safety Programme, the hard engineering issues of track safety have and are being addressed as a priority. The Railway Safety Programme 2004-2008 contains recommendations within Part B (Infrastructure) for new track relay, second hand rack relay, yards and additional track works. Seven recommendations are made within Part C (Human Performance) for the Infrastructure department (including p-way) relating to training, competence assurance, development of technical standards, third party requirements, the Monitoring Standard and engineering studies.

3.8.1 Workforce safety

Staff at all levels recognise the importance of safety, and are positive in their approach to and attitude towards trackside safety. The Safety Liaison Executive was consistently reported as working well, with regular meetings and briefings to staff. It is understood that management and technical teams are represented at safety meetings/briefings and that the output of these are conveyed to the wider audience through the various safety representatives. No records were available to confirm briefings or attendance, but all staff consulted in this review, confirmed that they received briefings. However, there appears to be no formal process for ensuring all staff are briefed, for example, capturing those that were not present.

Whilst the attitude to safety seems to have improved, it was detected from one of the interviews that there is a belief by some senior managers that “safety is a given”. In other words, safety briefings and detailed planning are not necessary, as staff will always work safely without being told to. This belief infers a lack of risk management, and clear planning and safety communications links must always be established (and recorded).

The issue of weaknesses in the process of safety briefings was also noted in other areas of the study and is therefore covered more generally in section 3.3.2 (see recommendation SMS7).

Based on the site visits carried out for this review, staff appear to display safety awareness on track and report that the TSC system can be effective, although implementation is apparently variable. Specific shortfalls in implementation of the TSC system were revealed from a number of site visits carried out as part of this review. The TSC did not check certification, failed to identify themselves on all occasions, only gave a briefing on one occasion, and no records were taken to confirm what had been briefed and to whom.

First aid boxes are frequently available, and qualified First Aiders are listed on notice boards. It was apparent from the queries regards first aid kits and recording of their usage, that not all accidents are being reported/recorded.

Recommendations

PW1	**Review, monitor and audit TSC role:** IÉ should review implementation of the TSC on the ground, including discussions as part of safety meetings/tool box talks by Safety Executives to highlight reasons for non-compliance with the Rule Book. Employees' understanding of the TSC role should be reinforced, including that once the TSC has set up the safe system of work, then they can also undertake work activities if appropriate The central Audit Team should audit the effectiveness of the TSC process on site to reinforce these changes, and ensure any recommendations are followed up. In addition to audits, the function of the TSC should also be monitored for effectiveness	
	Linked to	SMS9 (monitoring), SMS14 (audit)
	Priority	High
	Timescale	3 months
	Cost	N/A

PW2	**Accident records log first aid:** Establish a system of first aid kit use booking, to capture any 'small' accidents, which could become serious, or could be part of a trend. This will identify additional PPE requirements, i.e. gloves, and reduce the chance of escalating illness	
	Linked to	
	Priority	Low
	Timescale	3 months
	Cost	N/A

3.8.2 Organisation and management

Competence management: Job Descriptions and Safety Responsibility Statements, which clarify each individual's roles and responsibilities, have only been rolled out to some senior staff, such as the Divisional Engineers. They have not been issued to Chief Inspectors, PWIs and below, and it was reported that some HQ staff also had not received them.

There is a large reliance on local knowledge and years of experience that is held by IÉ staff, to meet the needs of the railway currently. IÉ have increased recruitment over the past few years, which has slightly diluted knowledge and experience, with contractors use more extensively to handle workload. This means that formalised safety management, such as competence management systems and formal and rigorous safety briefings, is even more important to manage safety risk.

Development of a competence management system, is being progressed, as one of the key items under the Railway Safety Programme. This includes providing a centralised database of competencies, as well as providing Assessors who, following successfully completed training, assess the skills of individuals before they receive the relevant certificate. This aims to bring competence management more in line with the SENTINEL system used in GB.

Pending the full implementation of a formal Competence Management system competence is generally being managed on a largely informal basis, relying heavily on the knowledge and judgement of line managers when allocating work and tasks. Until such time that competence management is fully implemented, therefore, there are risks particularly associated with staff recruitment and turnover, and key personnel retiring.

Resources: A number of interviewees, including senior managers, expressed the view that resources were tight and that numbers are likely to be further reduced. Whilst none of the staff interviewed reported that resources were dangerously inadequate, the consensus was that more "on track" and track support staff would be beneficial.

Method Statements: When questioned, interviewees advised that safety Method Statements and risk assessments only appear to be prepared for "big jobs" although there is no formal definition of when a Method Statement is required. (See section 3.3.6 and recommendation SMS17).

***Accident/incident reporting*:** As advised by the DE at Limerick Junction, accident and incident reporting takes place and are analysed for trends and KPI's etc, with results fed back to HQ. Any serious incident is reported via the Safety Executive to all areas through briefings, emails and notices etc.

The Railway Safety Programme provides for enhancement of Synergi, which is currently in progress. The improvements aim to address previous shortfalls in the relevance of the data fields, and usefulness of the reports.

CARA: Based on the interviews conducted, there is a low level of knowledge of IÉ's confidential accident reporting mechanism, CARA, which will limit the value that the system can deliver. (See recommendation CL3).

Recommendations
See recommendations SMS15 (competence management), and CL3 (CARA).

3.8.3 Decision making processes

Track Patrolling Standards: It was reported that track patrols get carried out as required by Standards, but this could not be confirmed, with patrols increased where local knowledge identifies poor track condition. Track Patrolling currently in one third of the network takes place on CWR once per week and negotiations are in hand to bring this to the rest of the system by the end of this year. The DEs advised there is no reduction in patrolling on new track areas. It is understood that other records such as CWR, stressing records, weld records, rail and other material records are kept, but at various locations including HQ, and hence are not always immediately available to the maintainers.

Network Risk Model: The primary interface that most p-way staff have had with the Network Risk Model, is via the Asset Rating System, although Divisional Engineers report that they have used the risk model to support the experience and judgement of key staff rather than as the key decision-making tool. Feedback was less positive further down the command chain, where there was confusion over its purpose and benefit and difficulties with its application. The Asset Rating system was widely criticised as being too general, too high level, and open to different interpretations leading to potential inconsistencies. These criticisms, in part, may stem from the fact that the Model is seen as requiring work 'for its own sake' (i.e. because of the requirement to rate assets) rather than being directly useful to those applying the ratings.

See section 3.6.4 on asset rating.

Recommendations

PW3	**Review the Frequency of track inspections:** Review the standards that dictate the frequency of track inspections, and determine if a reduced inspection regime on newly laid track would be appropriate	
	Linked to	
	Priority	Low
	Timescale	6 months
	Cost	N/A

3.8.4 Standards and procedures

Most standards are available down to the Permanent Way Inspectors (PWIs), but a number of senior managers, including some Chief Inspectors and PWIs were not clear on whether they had controlled copies. This point was also noted in the Second Implementation Review in 2001 (Section 3.1.6.4). From the information provided during the interviews, it was difficult to establish how many of the new standards have moved on from the "draft" status since the 2001 audit. It was independently confirmed from HQ that a Document Control system is not yet fully implemented. It could not be established how far, if at all, the new standards have been briefed, especially to the PWIs and the track gangs.

A number of track staff still retain and continue to use their old MW documents, as they report that they contain useful information that has not been transferred to the new standards. The depth of experience and local knowledge held by the present workforce largely mitigates the impact of the poor level of information in the new track standards. Clearly, in time, this could become more of an issue and needs to be addressed.

Section 3.1.5 of the 2001 Second Implementation Review reported "the lack of adequate and understood standards available to men on the ground still makes objective judgments difficult". It would appear that this has not improved significantly since 2001.

Recommendations

PW4	**Finalise preparation of new and revised standards and 'roll out':** Ensure that p-way standards that are completed are 'rolled out' at the earliest opportunity. Where a standard is new or introduces significant changes from a previous version, IÉ should carryout a 'controlled' briefing of the new standard or change to the affected staff (i.e. to ensure all relevant staff are briefed). IÉ should clearly identify those who are responsible for briefing changes in standards to the workforce	
	Linked to	SMS6 (briefing of standards), S1 (standards training), SMS3 and SMS4 (document content and management
	Priority	Medium
	Timescale	3 months and ongoing
	Cost	N/A

3.9 Structures

IÉ's structures department can be divided into two distinct parts:

- Bridges, embankments, retaining walls, coastal defences etc are managed on a day to day basis by the Divisional Engineers organisation
- Building structures including stations, buildings and workshops etc are managed by the Buildings and Facilities Manager

All 'structures', ultimately, fall under the control of the Chief Engineer for Infrastructure. A Divisional Engineer for each division (Athlone, Dublin, and Limerick Junction) is responsible for all fixed infrastructure. Below the Divisional Engineer, lines of route responsibility (for track and structures) fall under the Assistant Divisional Engineers (ADE's). Additional support is provided from the HQ Structures Engineer and the HQ Principal Engineer Track and Structures. Within the Buildings and Facilities team, three Buildings Managers are responsible for geographic areas.

Structures have also benefitted from substantial investment through the Railway Safety Programme. The 2004-8 Programme contains recommendations within Part B (Infrastructure) for renewal and upgrade of structures, painting, work on vulnerable interfaces, hand rails and signage, and an extensive programme of fencing. Investment in 2004 totalled €16.3m, and in 2005 was €8.8m. As noted before, seven recommendations are made within Part C (Human Performance) for the Infrastructure department relating to training, competence assurance, development of technical standards, third party requirements, the Monitoring Standard and engineering studies. Many of the general Safety Management System items will also apply to the infrastructure department, including auditing, competency, incident reporting, development of the Network Risk Model and accident/incident investigation.

3.9.1 Occupational/workforce safety

Wearing of Personal Protective Equipment (PPE) is regarded by those interviewed as an area that has improved significantly over the past five or so years.

Track Safety Coordinators: At workforce level, one significant area of non-compliance is implementation of the Track Safety Coordinator (TSC) role. According to the Rules, the TSC is responsible for setting up a safe system of work on infrastructure. Limerick Junction Division are apparently further ahead with implementation than elsewhere, but implementation is reported to be generally less than comprehensive. Reasons cited include a lack of resources (to make it possible to have a Lookout and a TSC on site), resistance to change, and having a TSC who was more junior than certain members of the gang. The Limerick gang now use this role positively as they rotate who acts as TSC on a daily basis, negating any resistance from the gang.

Method Statements: Another issue at the workforce level relates to Method Statements. While they are being used, there is a lack of clarity as to exactly when a Method Statement is required. A number of interviewees had reported that Method Statements are only used for the "bigger jobs" and not for day-to-day activities.

Method Statements appear to vary significantly in the level of detail provided. Some detail the sequence of work and do not deal directly with the safety issues, whilst others did address how the work would be done safely with risk assessments attached.

Recommendations

See SMS17 for recommendation relating to Method Statements. See section 3.8.1, recommendation PW1, relating to the operation and monitoring of Track Safety Co-ordinators.

3.9.2 Organisation and management

Safety responsibilities: Safety responsibilities are provided in the form of Safety Responsibility Statements (SRSs) for the most senior positions within the Chief Engineer's Infrastructure Organisation. These extend down the organisation to the Assistant Divisional Engineers (Track and Structures). IÉ intend to roll these down to lower levels in the organisation, but there are certain sensitivities around this due to Contract of Employment issues with the Unions. In our opinion, providing SRSs further down the hierarchy would help to provide clearer, more complete and more rigorous responsibilities and accountabilities down to the Track Ganger or Bridge Foreman. However, an alternative is to use a competence management system (currently being developed under the Railway Safety Programme) to manage and assure competencies for all safety critical and safety related staff. Such a system provides equal clarity to all staff on their key safety responsibilities, and is a robust system for tracking competency and training requirements.

The Safety Representatives that operate across all divisions appointed by the staff themselves are apparently working well. The role includes involvement in planning works/Method Statement production, as well as providing a route for safety issues to be raised from the employees on the ground.

Safety Responsibility Statements are also discussed in section 3.3.6 Competence and Resources. See recommendation SMS15 on safety responsibilities.

Competence and resources: There is currently no formal system for competence assessment for posts within the Chief Infrastructure Engineer's organisation, although as noted above, this is a key project in the Railway Safety Programme. Currently, competence is 'assessed' to an extent initially when appointing an individual to a post by addressing the requirements of the job description. Thereafter, certain staff that go through a 12/6 monthly performance appraisal system of review, have their training needs assessed as part of the process. This process, however, cannot be described as formal competence management.

A competence management system would allow initial assessments to be made against each grade/role. Identified training needs could then be addressed, enabling staff to reach the same competence for a particular grade or role they are undertaking. Under the Railway Safety Programme 2004-8 (items SMS4.1 and SMS4.2) a competence management database is currently being developed and populated, though the anticipated date for roll-out is not known. It is anticipated that this system will address the concerns raised here.

The views expressed on level of resources varies across the Infrastructure Organisation. In Limerick Junction the Bridge Maintenance Foreman stated that he was given additional resources (4No.) a couple of years ago, which has greatly improved his ability to service the maintenance requirements across the Division. Dublin DE staff advised there is a shortage of resources to deal with Outside Party issues (discussed later in Section 3.9.5). The Buildings and Facilities Manager's team has an expanding remit, which has been evolving since being established two years ago. Here, their major concern is the lack of a Safety Manager/Executive to service the Buildings' Managers across the network. This affects the work of auditing contractors working on stations and buildings and activities such as the reviewing of safety method statements.

Recommendations
See recommendation SMS17 (Method Statements).

3.9.3 Decision-making processes

Asset inspection: The new Standard for Structural Inspections issued in July 2005, has led to good progress in aligning the markings given on the 'bridge card' to the asset ratings used in the Infrastructure Asset Management System (IAMS). However, all Divisions appear still to be operating the old 'bridge card' system and are not fully engaged with the new standard and its contents. This is at least acknowledged at HQ in that a training programme on the new standard is due to be launched in March 2006.

In addition to the two-yearly visual inspection regime, 'Thorough Inspections' should be carried out at a six-yearly frequency. However, these do not appear to occur at present, and there has been no programme established which would enable this to become part of the way of working. Appropriate resources and budget must be identified and assigned for this requirement from the Inspection Standard to become a reality. Competence of staff to carry out the inspections will also need to be considered.

Asset ratings: The system for asset ratings has varying degrees of buy-in at different levels in the organisation. The Divisional Engineers and Buildings and Facilities Manager report using the Network Risk Model in discussion with the Chief Engineer to help to determine programme and budget priorities as part of the annual planning process. However, there is a view that the Risk Model is not currently a useful tool at the working level, as it deals in global terms. There is also a view that the asset ratings are too subjective, with a lack of consistency and repeatability, despite the advice given by Asset Rating Guidance documents. For example, it is not clear that a bridge rated by an individual in Athlone will correspond with one rated by a colleague in Dublin. Other issues were also raised with regard to its usefulness in the asset management of buildings and facilities. Having one rating for a large station, such as Heuston, is not conducive to the effective management of safety at that asset, or help to identify specific risks that require urgent or prioritised attention.

Flood scour management: The 'Second Implementation Review of Structures' (March 2001) made recommendations concerning structures vulnerable to scour action. IÉ are currently in the second year of a three-year programme of inspections of bridges vulnerable to scour. This will ensure that all any remedial works are identified and programmed accordingly.

However, based on interviews at Divisional level, there does not appear to be progress with developing a flood/scour management system to ensure safety of structures at times of flood. There also appears to be no procedure that looks at the minimum actions that should be taken at vulnerable structures (i.e. when should a speed limit be imposed; when should a line be closed; what is the procedure for re-opening a line following a flood occurrence; how is the risk of scour occurring during flood conditions assessed; and, when does an inspection have to be carried out before the line can be re-opened).

Risk based approach to asset management: Considerable progress has been made in terms of managing potential risks to the safe operation of the railway. Evidence of this risk based approach can be seen in terms of risk assessments carried out on "Vulnerable Road/Rail Interfaces" (Jan 2004), "Safety at Low Clearances Bridges – Risk Assessment for Rail over Road Bridges" (Jan 2003) and "Prioritisation for the Replacement of Jack Arch Construction Road over Rail Bridges" (Feb 1999). In each case, a study has been undertaken and the results used to produce a programme of work and prioritise the work to be carried out. A report on wheel containment at underline bridge locations (for derailment protection) is also at draft issue stage.

See also section 3.6 Network Risk Model for recommendations relating to Asset ratings (NRM3).

Recommendations

S1	**Standards training programme:** Implement the planned training programme on the introduction of the new Standard for Structural Inspections	
	Linked to	PW4
	Priority	Medium
	Timescale	3 months
	Cost	N/A

S2	**Programme of thorough inspections:** In accordance with the Standard for Structural Inspections (July 2005), ensure that a programme of 'Thorough Inspections' is started immediately and that adequate resources are available to undertake this exercise. This should include reviewing the competency and training requirements necessary to carry out such a programme of inspections. (Suggest led by Chief Engineer)	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

S3	**Flood scour management system:** Develop a flood/scour management system to ensure safety of structures at times of flood, including the conditions under which the track must be closed and may be re-opened. (Suggest led by Chief Engineer)	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A

3.9.4 Standards and procedures

Most interviewees expressed that controlled copies of the standards could be found in the 'outlook folders' on the intranet. In terms of issuing new standards, it was stated that staff are sent an e-mail informing them that a new or revised standard has been introduced, but little briefing of these standards appears to be occurring.

At present, the system of introducing the standards seems to be passive, relying on the user taking time to read and review the standards issued, and determine the changes made. Briefings are particularly important for new standards, as the rationale behind them needs to be explained as well as some of the key parts of the standard to be adhered to. If the standard is mandatory, then good practice would be to plan a proper 'roll-out' with appropriate time and resources given to briefing the procedures, obtaining feedback and improving the standards to make them more workable.

Recommendations

No specific recommendations but refer to SMS6 and PW4 for briefing of standards.

3.9.5 Outside Party (Third Party) works

At HQ level there appears to be some good work being undertaken with outside parties working groups and the production of Technical Standard TA1 – Technical Approval of 3rd Party Construction Projects. However, within the Dublin DE's department, there are apparently issues that require attention due to a potential shortfall in resources. With the volume of Outside Parties' work expected to grow three-fold in the Dublin area over the next few years, additional effort will be required to control the risks that this will bring. Staff in the Dublin division reported that they are not able to adequately cover reviewing all planning applications etc. to ensure developers have appropriate requirements enforced on them when undertaking construction works adjacent to IÉ infrastructure.

Recommendations

S4	**Review Outside Party work/risks:** Review the risk from Outside Party works and how IÉ manages this risk. This should include reviewing the resources required and consideration should be given to having a dedicated Outside Parties Engineer with a small team that would be responsible for this area of work.	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

3.10 Signalling, Electrical and Telecommunications

The Signalling, Electrical and Telecommunication organisation responsible for maintenance and faulting falls under the overall responsibility of the Chief Engineer Infrastructure.

The maintenance and faulting of the Signalling and Electrical infrastructure falls under the responsibility of the respective Assistant Divisional Engineers at Dublin, Athlone and Limerick Junction. Whilst these teams are responsible for both the Signalling and Electrical infrastructure, the electrical works are generally of a minor nature. Standards and Professional Head support is provided by HQ at Dublin.

The maintenance and faulting of the Telecomms infrastructure is undertaken by staff based within the three Divisions, but is managed from HQ in Dublin, who also provide Standards and Professional Head support.

Signalling, electrical and telecomms have benefitted from considerable investment through the Railway Safety Programme. The telecommunications part of the 2004-8 focusses on continued availability and safety enhancement of the core communications infrastructure. Much of the signalling investment centres on continued introduction of the CTC system across the network. The electrical part of the Programme focusses on renewing electrical wiring that does not conform to modern standards. Investment in 2004 totalled €6.8m in this area, and in 2005 was nearly €10.4m. Total investment over the five year programme in this area is scheduled to be €42.1m. As noted before, seven recommendations are made within Part C (Human Performance) for the Infrastructure department relating to training, competence assurance, development of technical standards, third party requirements, the Monitoring Standard and engineering studies. Many of the general Safety Management System items will also apply to infrastructure, including auditing, competency, incident reporting, development of the Network Risk Model and accident/incident investigation.

3.10.1 Organisation/resources

Those interviewed for this study commented that resource numbers had significantly improved from the previous position during the IRMS Audit in 2001 and that they met current needs.

Regarding competency, all individuals interviewed stated that given the greater number of staff since 2001 and the training courses that have been held in the signalling teams, overall competence has greatly improved since previously assessed.

There are, however, some specific concerns regarding the status of the current organisation and resources:

Availability of Lookouts: Lookouts are provided by the Permanent Way Teams, and when these are not available, current practice is to undertake the work without Lookout protection, which is in direct breach the Rule Book. From ADE level downwards, it was consistently reported by those interviewed that the Lookouts work set hours during the working week and outside of these hours, including weekends, Lookouts are not available to provide safe systems of work for Signalling Faulting activities. It was reported, for example, that Track Circuit faulting was being carried out even if no Lookout was available, because the need to keep trains running was a higher priority.

Competence management: An in-house competence management system was observed for the Signalling Operations staff within the CTC; this appeared to be adequate. There was, however, no system in operation for the SET Infrastructure staff responsible for maintenance and faulting. It is understood that the introduction of the competence management system under the Railway Safety Programme 2004-8 (items SMS4.1 and SMS4.2) this issue will be addressed.

Other issues relate to a lack of SRSs for all staff, and the need for confirming communication requirements (see recommendation SMS15 and SMS16).

Recommendations

ST1	**Provision of Lookouts:** Urgently address the issue of Lookout availability, to ensure that Lookouts are provided as consistent with Rule Book requirements. Consideration could be given to training of Signalling and Telecomms staff as Lookouts	
	Linked to	
	Priority	Urgent
	Timescale	1 month
	Cost	N/A

See also recommendations SMS15 (safety responsibilities and competence), SMS16 (communication requirements).

3.10.2 Maintenance

Fault management: the fault reporting and management system within the Telecoms Network Management Centre uses readily available fault reporting and management database software tools, allowing detailed management and tracking of all faults together with a record of fault rectification and route cause analysis. This provides a significant amount of data that can be used to optimise the preventative maintenance priorities.

However, no such system is in place for signalling faults, which are dealt with in a more informal manner between Signaller and Maintenance Technician. Fault reporting to higher levels of staff is based on the Daily Operations report, which is limited to faults that have attributed train delay minutes. This, therefore, reduces the visibility of unreported faults and underlying trends and provides a gap in effective management of safety.

Recording of routine maintenance activities: the 2001 IRMS report raised a finding regarding the completion of 'facing point lock' tests. This review was unable to find evidence from the signalling team that the required three-monthly tests were being carried out, as apparently relevant records are not kept or maintained. However, individuals at all levels confirmed that these tests were being carried out, and site inspections of the points at Limerick Junction raise no concerns that this is not the case.

Asset inspection and asset ratings standards and procedures: there has been very little progress on development of standards and procedures since the 2001 IRMS audit, at which time only four procedures had been issued. It is understood that no Signalling procedures and 10 Telecoms procedures have been issued since 2001.

Method Statements: Method Statements were found to be in place for track renewals activities where multi-disciplinary input and coordination was required. However, these Method Statements have been prepared by the Track team for their work and do not specifically deal with SET activities. No evidence was found of inter-disciplinary consultation in developing the document or for subsequent briefings. It is also understood that Method Statements are not prepared for activities of a routine nature.

Recommendations

ST2	**Issue maintenance standards:** Issue and brief out a complete suite of maintenance standards for SET.	
	Linked to	SMS3 (review of Company Standards), SMS5 (document control), SMS6 (briefing of standards)
	Priority	High
	Timescale	3 months and ongoing
	Cost	N/A

ST3	**Develop and formalise signalling fault system:** IÉ should extend the use of the Telecomms SAP R3 fault reporting and managing system, or similar, to develop a more effective and formal system for signalling faults	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

ST4	**Inspection and maintenance records system:** Implement a records system to ensure that inspection and maintenance activities are formally recorded with a clear and robust audit trail that demonstrates compliance with company procedures	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

For recommendations relating to Method Statements see SMS17.

3.11 Traction and rolling stock

3.11.1 Company Standards and Safety Policy

The Mechanical Engineering Department's standards are based on a variety of sources including UIC, EN, BS and British Railway Group Standards, and drive all working, maintenance and safety related documentation.

The inclusion of British Railway Group Standards raises some concern on the risks of employing standards of other railway administrations, and a question as to whether consideration has been given to any potential latent risks. British Railway Group Standards are not designed to be applied in part and any changes that are made to these standards are done so based on British rail experience, the effect on other Railway Group Standards and through industry consultation. IÉ is not party to the industry consultation process, and therefore, is denied input. Railway Group Standards are accepted as a means of managing risks to a level that is ALARP but this does not imply that this may be so when such standards are applied within other railway administrations since the experience may well differ.

In addition, some UIC standards are at variance with other industry standards which are deemed to be "best practice" and utilisation of any UIC standard is often mandated only when cross border operations require it which may bring in to question the relevancy of such standards for Iarnród Éireann.

RS1	**Gap analysis of high-level documentation:** IÉ should review the high-level safety documentation within the Mechanical Engineering Division to identify and resolve any risks and gaps that may necessitate change. This should be linked to a strategy for Mechanical Engineering's safety management system as a whole	
	Linked to	SMS3 (review of Company Standards)
	Priority	Medium
	Timescale	6 months
	Cost	N/A

3.11.2 Vehicle acceptance process

The Vehicle Acceptance Body (VAB) process is a constituent part of the application of Railway Group Standards, but IÉ utilise the VAB process only for the introduction of new vehicles and not for the maintenance or modification of existing vehicles. IÉ appear to compensate for this gap in the VAB process by internal assessment, although this is not based on any independent assessment of competency of the people involved, as is required for VAB signatories. There is also no form of certification to validate the area of acceptance by persons within IÉ as required by the VAB process.

IÉ do not appear to have a documented approval process for providing a consistent approach for the approvals relevant to both new and existing vehicles.

The review has found no evidence that IÉ are preparing for the forthcoming approval processes by Notified Bodies (NB) as mandated by the High Speed and Conventional Directives. Such processes will supersede those for VAB's and with NB's already in operation in Britain for certain projects, it is considered timely for IÉ to assess these implications in the near future since they will have a significant impact on their Safety Management System. From a safety perspective, the relative roles of the of the NB and the relevant authority of the HSE within GB will differ from the relationships currently in existence between the VAB approval bodies and the HMRI. It would seem appropriate, therefore, for IE to consider the implications of the introduction of the Directives and Notified Bodies referenced to current relationships with the relevant authority of the HSA and thus make plans for the required change. The High Speed Directive is already law within the UK and the Conventional Directive is expected to be statutory in 2006.

Recommendations

RS2	**Review methodology for approvals:** IÉ should develop a formal methodology for approvals covering both new and existing vehicles. The methodology should include the documented process, formal certification and independent assessment of competencies of authorised signatories	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	External review €50k, then internal

RS3	**Working party EU Directives:** IÉ should form a working party to establish the effects of change to their safety management system from the introduction of the EU Directives relating to the acceptance of vehicles	
	Linked to	
	Priority	Medium
	Timescale	Ongoing
	Cost	N/A

3.11.3 Document, drawing and work control

Documents and drawings are controlled centrally at Inchicore.

- All documents are controlled via an intranet system linked to all depots, with a "blue box" approval stamp to ensure that appropriate authorities only are able to sign off each document and an electronic advance warning and distribution facility to ensures depots are always provided with the latest electronic issue. Based on spot

checks at each location visited in this review, the process was found to be consistent and correct

- Drawings are not controlled electronically but the drawing register and distribution centre at Inchicore was considered by all Depot Managers to be efficient and robust. At depot locations, however, the system was found to be less robust where some drawings received were kept stored for reuse and only by voluntary telephone contact with Inchicore could a check be made on the status of each drawing. One weakness of the current arrangements is that depots can only check on the issue status of drawings during "office" hours

Maintenance instructions are drawn from the intranet and the results are placed in the SAP system (online document control system). This process appears to be robust based on checks carried out at the depots. Drogheda has the advantage over other depots of electronic "touch pad" sign off of work, which obviates the need for paper completion sheets. Individuals at Fairview and Cork considered that the facility at Drogheda should be extended since it would reduce the level of bureaucracy and risk of false reporting in the SAP system, and help track any outstanding work automatically.

Although local instructions for control do apparently exist for the management of maintenance instructions and drawings, it could not be confirmed that these were being widely and consistently applied.

Recommendations

RS4	**Depot management of safety instructions & drawings:** IÉ should brief staff at each location on the local instructions for managing maintenance and safety instructions and drawings. This should include the inter-relationships with SAP and, when available, application of an electronic drawing register	
	Linked to	
	Priority	Medium
	Timescale	4 months
	Cost	N/A

3.11.4 Company safety meetings

A number of meetings are held at various intervals at which safety related issues are discussed. These meetings involve a variety of both HQ and depot staff. The meetings described at HQ level appear to cover relevant issues and are properly recorded with a number of reports and documents included in support of the relevant agenda.

However, the structure of meetings is quite complex and the exact process for flow of information between meetings and links between the output of one meeting to another is

difficult to follow. There are a large number of meetings and there may be some unnecessarily duplication. For example, technical meetings with each depot appeared to be carried out separately instead of jointly where cross feeding of information would allow group participation and intelligence sharing. A degree of rationalisation may be possible and a clearer hierarchy for core meetings would provide increased assurance that safety related issues would be appropriately routed and resolved.

Interviewees felt that the volume of information produced in support of meetings is high, and whilst in some sense this at least means issues are being raised and dealt with, some interviewed expressed concern that at certain meetings a great deal of data and statistics (not necessarily linked to safety) appeared to swamp any safety related issues. For example, the Mechanical Engineering Advisory Group meeting would present for its executive members a report of some 200 pages, taken up chiefly by separate fleet reports. Although these fleet reports are the subject of a detailed review at a different meeting, they are nevertheless included again for discussion at the aforementioned meeting instead of providing a diluted executive summary. Whilst not a primary safety concern, good practice would be to reduce the volume of non-related safety information to ensure that sufficient time is left for safety related discussions.

Internal depot meetings related to safety take place but, as at Inchicore, the relationship between the depot and HQ meetings is not always clear. Internal meetings were at the behest of the depot manager in terms of what and when. There is a lack of consistency between the methodology applied at Fairview and that at Drogheda and Cork (with Fairview presenting a more disciplined approach compared to the other depots). The record keeping of depot meetings (including discussions on safety related issues) appears to be vague, and feedback suggested that there is little emphasis for recording issues and resultant actions.

Briefings, say for changes to maintenance instructions, are typically given in separate groups or individually, and there is a generally unplanned approach as to who gave the briefing and to whom. Records are rarely kept to confirm who had been briefed and on what subject. It is considered that such a lack of formal approach has the potential to not capture all personnel concerned and to give scope for error in communication.

Recommendations

RS5	**Review meeting structure and remits:** Mechanical Engineering should clarify the structure for meetings, each with a defined remit. In particular, this should specify the format and scope of each meeting with respect to safety	
	Linked to	
	Priority	Medium
	Timescale	4 months
	Cost	N/A

RS6	**Protocol for depot safety meetings:** IÉ should develop and implement a protocol for safety meetings at all depots, linked to the company hierarchy of safety meetings. All safety related briefings to depot staff should be given to as collectively wide an audience as possible with sign off by those briefed	
	Linked to	SMS7
	Priority	Medium
	Timescale	3 months
	Cost	N/A

3.11.5 Training process

Training is managed by Inchicore via the HR department. Staff recognise a significant improvement to training over recent years and it is clearly recognised as an essential service to staff. However, the process, roles and responsibilities for the assessment and qualification of competencies are still felt, by those interviewed, to be unclear. Equally, visits to the depots suggest that there is a perceived lack of a clear strategy for training.

The opinion of those interviewed was that there have been improvements to the quality of training, although in our view there may be scope for further improvements, especially in areas where technology and modern learning methods can be utilised. For example, of the types of training undertaken at depots, all were said to be spoken or given against written material with no mention of slides or video assistance.

Drogheda has a training manager who conducts certain training activities at Drogheda and at other depots, but the role of this person within the company scheme is not clear. Depot managers apparently have some influence on the nature of training programmes, although in our view greater empowerment of depot managers could result in improved training.

Recommendations

RS7	**Training strategy:** To build further on improvements to training, IÉ should review the training programme and strategy, with particular emphasis on the quality and scope. Development of the strategy, and ongoing content, should take into account the views of depot managers, and consider better use of local facilities to deliver improved training quality	
	Linked to	
	Priority	Medium
	Timescale	12 months
	Cost	N/A

3.11.6 Management of change

IÉ places a significant reliance on the skills and professionalism of technical and managerial staff at Inchicore HQ to control and implement change throughout the company. IÉ report that a process is in place for managing change, and that instructions are available at Inchicore for controlling and managing risks. These were not reviewed, and it is not clear the extent to which they relate to Company Standards 3 and 6 (Organisation Change and Validity of Changes in Plant and Equipment).

Generally high safety awareness was apparent in the depots observed during the visits, although awareness of formal change management and the implications for associated risk assessment appears comparatively poor.

Safety tours are being carried out across all locations (which is good practice and a requirement of the Company Monitoring Standard). There is some evidence, however, that the scope of tours may not include all keys areas of risk. For example, alterations to the depot facilities and infrastructure were in progress at certain locations, but none of these were specifically identified as areas of risk on the tour.

Recommendations

RS8	**Change management:** IÉ should review current arrangements for management of change and brief staff on the requirements as defined in formal instructions	
	Linked to	
	Priority	Medium
	Timescale	3 months
	Cost	N/A

3.11.7 Train crew intervention

Interviewees suggested that there is a closer working relationship between drivers and depot engineering staff on the DART in comparison to other depots, due to the DART being essentially self-contained.

Although train crews are apparently empowered to undertake on-vehicle fault investigations, interviewees at depots suggest that this may be being under-utilised with regard to corrective action. From practices adopted in the UK, the intervention by train crew has brought about improvement to overall train performance and to the safe operation of trains, especially those that developed faults in the course of operational service.

Recommendations

RS9	**Train-borne faults:** IÉ should conduct a review into current practice with regard to train crew intervention and corrective action, to ensure that overall safety and operational benefits are being optimised	
	Linked to	
	Priority	Low
	Timescale	6 months
	Cost	N/A

3.11.8 Drugs and alcohol policy

See Section 3.5.

3.11.9 Safety related defect reporting

The management of safety related defects is not documented and there is no clear process for communicating relevant information quickly across the IÉ network. It should be noted that only relatively recently have IÉ had depot facilities dispersed across the network, so in the past this issue was less relevant.

IÉ explained that any safety related defect is communicated to the engineering/technical department at Inchicore HQ or to the appropriate person outside normal working hours. The contact with the latter is not always clear, and it is not clear to all staff if this person is available at any time of the week. Depots would normally deal with safety related defects locally e.g. by red card[8], and would then await any subsequent instructions from HQ. Some of those interviewed suggested that several hours might elapse between the

[8] If staff are concerned about the safe running of vehicles when a defect occurs, they will place a red card on the vehicle and notify operations control accordingly. The red card effectively puts a "stop" on any attempt to move the vehicle until the defect has been rectified. Only authorised staff can remove the red card.

incident and any corrective instruction received. Therefore, a problem arising on one particular fleet may affect potentially the safe operation of other fleets, yet the method used for communicating the defect relies on the promptness and the availability of staff at HQ. Consequently, trains carrying potentially the same problem may continue in service for several hours before the assessment is made and communicated to other affected depots.

In GB, a process called NIR (National Incident Report) is used whereby any safety related defect is instantly reported to all depot locations and listed departments so that responsible managers are made aware at the same time of the initial report and can institute measures on an urgent basis should that manger consider the problem to apply to the fleets under his control. No such equivalent exists within IÉ and any delay to the reporting of such incidents, as is currently the case, could potentially lead to unsafe conditions.

Recommendations

RS10	**Management of safety related defects:** IÉ should develop a documented process for managing all safety related defects at the earliest opportunity. This should provide a means of rapid communication of reports by fax or similar to all listed depots/departments, the details of such incidents at the time of the initial report	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	N/A (internal)

3.11.10 Safety culture

Observations and discussions carried out for this review reveal that Inchicore is very much relied on to develop systems, depot procedures and initiatives on safety. By comparison, some organisations in the UK place greater ownership of safety at depot level, for example allowing local decisions about enforcing particular practices and developing initiatives. From a cultural perspective, 'ownership' of safety tends to have a strong positive impact on reinforcing desired behaviours 'at the sharp end'. Also, those at the 'sharp end' (or close to them) are often in the best position to recognise risks, and provide input into how these risks should be controlled, with guidance, support, leadership and audit coming from the centre.

Staff are clearly committed to safety, although there were a number of observations that suggest some complacency exists. At Fairview, very few restraining chains were anchored to the vertical posts on elevated walkways, and at Cork, where ground works were being carried out, there was no recognised walking route and underfoot conditions

were somewhat hazardous. There is therefore some room for improvement with basic housekeeping. Greater use of CARA may help to identify issues confidentially (see recommendation CL3).

3.12 Electrification

IÉ's electrified railway system is the Dublin Area Rapid Transit (DART) system, which is a 1500Vdc overhead system enabling the operation of electric rolling stock between Greystones in the south to Malahide in the north with a branch off to Howth. The DART system operates jointly with diesel passenger and freight rolling stock over the existing infrastructure. A summary of the operational elements of the DART system are provided in Appendix D.

The system has been designed and constructed in 3 principal stages, namely:

- The original scheme from Bray to Howth completed in 1984
- The extensions from Bray to Greystones and from Howth Junction to Malahide completed in 1999

The ongoing Dublin Area Signalling Enhancement (DASH) scheme will introduce eight-car trains throughout the system and is due for completion in 2006. In addition to platform extensions and the procurement of additional rolling stock this has required the strengthening of the existing electrical traction supply system.

A report 'Electrification Technical Report' was prepared by Parsons Brinckerhoff (March 2001) following an audit of electrification conducted during January and February 2001. The purpose of the audit was primarily to check and monitor progress made by the IÉ electrification maintenance division responsible for the DART system, against the recommendations for Electrification detailed in the earlier IRMS Report. The 2004-2008 Railway Safety Programme contains no reference to the electrification system of the DART.

3.12.1 Documentation

Engineering systems, standards and documentation: The 2001 IRMS audit highlighted a suite of OCS (previously OHLE) Procedures and Work Instructions that were in development with a number at the draft stage. No high-level standards existed at the time, and 19 OCS Procedures and 14 OCS Work Instructions were in varying stages of final review with none issued for implementation.

The OCS numbered range of standards have now been withdrawn and replaced by Infrastructure - Electric Traction Standards (known as 'I-ETR Standards'). The current suite of standards will apparently be made available on-line although present progress is

relatively slow and full or even partial introduction could still be some months away (only 6 have been issued, and 14 are currently in development).

Some progress has been made with the preparation and introduction of the new suite of standards, procedures and work instructions, although those interviewed report that progress has been hampered by the unavailability of the necessary technical staff to review and amend the documents. The culmination of the DASH scheme in 2006 will release a number of key individuals to undertake these reviews to help complete the preparation, 'rollout' and briefing of the documents.

Recommendations

E1	**Implement new OCS ETR Standards:** OCS ETR Standards should be implemented at the earliest opportunity. There are a number of important OCS Maintenance standards that have been drafted and are awaiting final review and it is recommended that this is given further impetus to complete	
	Linked to	
	Priority	Medium
	Timescale	6 months
	Cost	N/A

3.12.2 Occupational/workforce safety

Safety culture and occupational safety: The 2001 audit highlighted encouraging progress being made at Fairview depot and in particular the establishment of the Health and Safety Committee which at the time met regularly and undertook regular audits of the depot. There were concerns raised at the time that major cultural problems resulted from staff refusing to sign forms.

Since the 2001 audit, further significant progress has been made in continuing to raise awareness of safety issues with all grades of staff in the depot and there are encouraging signs that the safety is becoming more embedded (for example, PPE appears to be widely worn and housekeeping appears good). The Health and Safety Committee continue to meet and all grades of staff are involved with discussions and decisions. The original cultural problems are steadily improving with staff now better understanding the reasons for the filling out of forms and associated paperwork. Further improvements include the new safety library which is positioned on a major thoroughfare and encourages staff to view, and if necessary, take away literature for further study. In addition, the safety notice boards are well positioned in the same general area, are clear and legible and contain a great deal of relevant and topical information.

Human resources and training: The 2001 audit highlighted the need to enhance both the quantity and calibre of staff in certain areas of work. There had been significant positive recruitment moves with some success in recruiting both OHLE and substation staff although this was an ongoing problem with other areas of the economy booming and it proving difficult to attract staff of the right calibre.

Since the 2001 audit, further positive moves have been made to recruit, and more importantly to retain the key maintenance staff. One residual area of concern regards the lack of succession planning whereby the next generation of foremen, supervisors and engineers are being earmarked and then guided into a promotional structure. Historically the organisation has relied on the long term commitment of the loyal staff, however this situation could easily change and without succession planning being put into place now, could lead to key posts not being filled by suitably qualified and experienced staff.

The Electrification maintenance organisation at IÉ operates a reasonably effective system, whereby staff are only selected to undertake specific tasks if the Supervisor considers them competent to do so. This system works reasonably well provided that key staff with knowledge of their workforce are available. However, if the Supervisor is unavailable, or the work is of an emergency nature, there is a risk that staff are dispatched to carry out tasks for which they are not competent. Additionally, if the contract for the future maintenance of the 38kV ac ESB switchgear is transferred to IÉ then it will be necessary to assess the suitability of staff for undertaking this work.

For recommendations relating to competency management, see Section 3.3.6 Competence and Resources.

Recommendations

E2	**Improved reporting of OCS & traction faults:** It is recommended that refresher training is provided to remind control room staff of the importance of timely reporting of OCS and traction faults and the implications if this is not followed	
	Linked to	
	Priority	Low
	Timescale	6 months
	Cost	N/A

3.12.3 Organisation and management

Management of contractors and third parties: At the time of this review the only third party organisations on site were those from Balfour Beatty who were completing commissioning works at a number of traction substations as part of the DASH project,

and in each case, were accompanied by a traction electrician. With the future deregulation of the Electricity Supply market in Ireland, the ESB will cease maintenance of the 38kV ac switchgear and this work will be contracted out to another (as yet unnamed) organisation. Whilst this future maintenance work may be undertaken by IÉ traction staff, it is possible that third party organisations may be engaged.

Control of the introduction of New Works plant and equipment: At the time of the site visit, IÉ were in the process of taking delivery of machines that were specified and procured in 2000. These machines were procured to take the place of the wiring train; this train consisted of former coaching stock that was converted to flat roofs to enable staff to work at heights on a long continuous platform. This method of working fell out of favour following a number of serious accidents and a fatality in the UK in the early 1990's.

During the current review the two new Volvo road/rail access and maintenance machines (to take the place of the wiring train) were not being used and were therefore not inspected. It is understood, however, that following a detailed procurement specification and protracted discussions between IÉ and their nominated consultant, that the final delivered machines are fit for purpose and have been a major improvement for safely undertaking OCS maintenance when compared to the former wiring train.

Recommendations

E3	**Develop Processes for Private Subcontractors/Third Parties:** Should private contractors and third party organisations be engaged to undertake Electrification works on IÉ infrastructure, the following are recommended steps that should be taken to manage their activities: • Develop a formal process with associated procedures to control safe access to the infrastructure including trackside and substations • Develop a process to assess the competency of sub-contractors to ensure their skill levels are sufficient to satisfactorily undertake the work safely and competently	
	Linked to	
	Priority	Low
	Timescale	Depends on decision regarding subcontractors and third parties
	Cost	N/A

E4	**Clearer Remits for Future Plant Procurement:** It is understood that IÉ are not planning to procure any further new Electrification maintenance plant for the time being. Should IÉ plan to introduce further new plant in the future it is recommended that a clearer remit should be agreed between IÉ and their consultant (if appointed) with the operational requirements of the maintenance organisation being the prime consideration rather than the practices of the UK industry There are therefore no recommendations to add at the present time	
	Linked to	
	Priority	Low
	Timescale	Depends on procurement plans
	Cost	N/A

3.12.4 Systems

Systems – substations, switch houses and overhead contact system: the only significant area of concern in the 2001 audit related to the principles of making the substation equipment electrically safe for access to persons for maintenance. With respect to the OCS system, one area of concern was the contact wire installed under the original scheme and the contact wire installed during the extension to Greystones and Malahide. Whilst both are 107mm^2, the two conductors have different profiles and there is a residual risk of the contact wire parting should the wrong splice or end fitting be used.
Fairview depot isolation procedures and related safety issues: since the 2001 audit a simple and robust means of providing local isolations for train maintenance staff has been introduced with simple documentation exchanging hands.

The depot is presently in the process of ordering new long earths and insulated poles to replace the damaged and now life expired earths and poles that are presently in use. These long earths are required for earthing the OCS during isolations in the maintenance shed by attaching one end to the contact wire via a screwed clamp, with the lower end permanently attached to an earthing bar, which in turn is attached directly to one of the two running rails. Over time, these earths have become damaged and in a number of cases repairs have been made.

With the forthcoming commissioning of Fairview New Sidings located on the opposite side of the main line to the depot, there will be a risk associated with maintenance and operational staff accessing to trains berthed in the sidings. At the present time, it is understood that a new footbridge is planned to cross the main line adjacent to the depot.

As a future development, consideration could be given to the implementation of further depot protection facilities such as train de-railers fitted at locations on each road outside both ends of the maintenance building. These would be employed in conjunction with isolation and earthing of the OCS and would prevent electric trains running into the shed

when trains are already in-situ, and in particular, when vehicles are being raised on jacks.

Recommendations

E5	**Provide safe access to Fairview sidings:** We understand that authorisation has now been given for a footbridge to provide safe access to Fairview New Sidings. IÉ should put this in place as soon as possible, and ensure maintenance and operational staff use the bridge	
	Linked to	
	Priority	High
	Timescale	3 months
	Cost	Depends on outcome of risk assessment

E6	**Introduce earthing equipment management system:** It is recommended that a Management System is introduced which will identify and log new OCS earthing equipment and thereby enable future inspection and monitoring. This should help prevent occurrences where this equipment has been inadvertently damaged and not reported. Such a system should include a procedure to record and inspect the equipment and a process for disposal of damaged equipment	
	Linked to	
	Priority	High
	Timescale	3 months from delivery of new equipment
	Cost	N/A

4. Proposed action plan

4.1 Summary of recommendations

Based on this review we have made a total of 67 recommendations:

- 1 urgent recommendation
- 26 high priority recommendations
- 32 medium priority recommendations
- 8 low priority recommendations

The single urgent recommendation is to address apparent failures in consistently providing lookout protection.

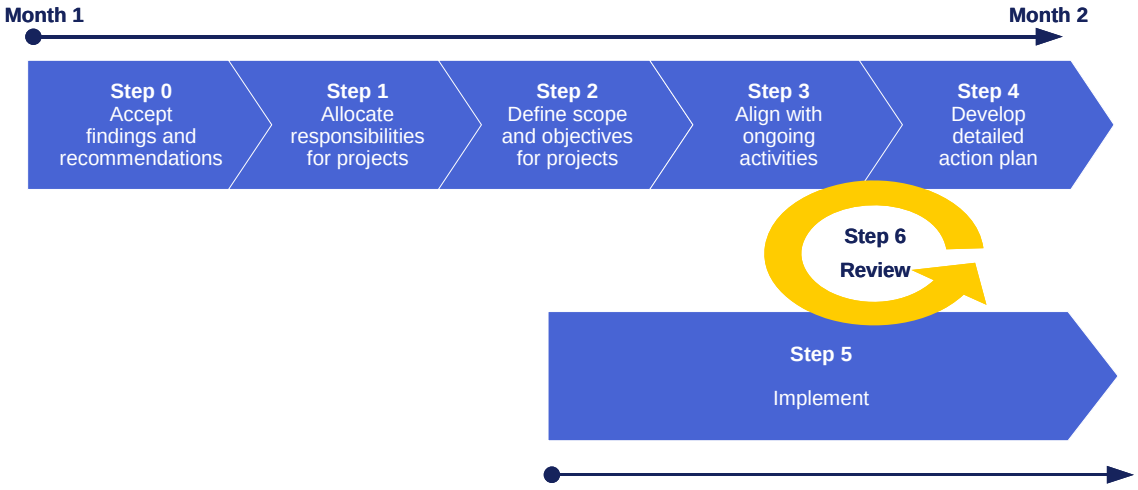
No significant capital investment will be required to deliver the recommendations; most relate to systems, implementation and processes. Some recommendations relate to progress on items already within the Railway Safety Programme, and two relate specifically to the arrangements for improving management and reporting on progress of the Programme.

4.2 Proposed action plan

Although no major capital investment is required to deliver the recommendations, we suggest a high-level action plan for implementing the recommendations. More detailed plans will need to be prepared by the RSC, DoT and IÉ after further review (as discussed in Step 1 of this high level action plan). The intention is to ensure that the recommendations are accepted, clearly defined in terms of scope, resources and timescales, and then progressed accordingly. We are aware that IÉ have a large number of initiatives underway, and a key aspect will be effectively aligning with parallel initiatives to ensure overall efficiency.

Based on our experience of good practice in implementing safety improvement projects, we provide below, and summarise in Figure 6, a description of the overall approach for implementation. Note that recommendations designated as ‘Low’ priority have not been included in this plan. This does not, however, mean that they should be disregarded, rather the focus for the first 12 months should be on recommendations with ‘High’ and ‘Medium’ priorities.

Figure 6: Proposed action plan



Step 0: Accept findings and recommendations

Before implementation the recommendations, the IÉ CEO and Chief Safety and Security Officer must secure commitment from all senior line managers and support functions:

- Agree that the findings of this report are valid
- Agree that the recommendations of this report provide a sound basis for improving the areas where deficiencies have been noted

Practically, the workshop on the draft recommendations represented the key initial forum for promoting the results of the review to senior management.

Equally, the Commissioner (RSC) and the Assistant Secretary (DoT) must accept the recommendations that relate to their organisations.

Step 1: Allocate responsibilities for projects

After securing overall commitment to the findings and recommendations, we suggest that the RSC, DoT and IÉ group the recommendations relating to each into mini "projects" and allocate responsibilities for delivering those projects.

In our view it is key that these responsibilities are clearly allocated to specific individuals, who will be required to both deliver the recommended actions, and report on progress.

Step 2: Define scope and objectives for projects

Each mini project should have a defined scope and set of objectives to ensure activity remains focussed on the recommendation (for most recommendations in this report, this is likely to be very straightforward). For the larger and/or longer-term mini-projects, setting out a timeframe together with key milestones will also be beneficial.

A key part of the scope definition will require formal acceptance or rejection of the recommendations in this report.

Step 3: Align with ongoing activities

We are already aware of a number of instances where a recommendation aligns closely with ongoing activities in IÉ and the RSC.

At this stage, all the recommendations should be considered as to whether they could sensibly link into existing activities, to avoid any unnecessary duplication of effort. Linking recommendations to existing activities should not, however, mean that progress on the recommendation is not tracked.

Step 4: Develop detailed action plan

Based on the steps above, a more action plan should then be prepared including consideration for any additional support which may be required.

Step 5: Implement

In our opinion, implementation of all 'high' priority and 'medium' priority recommendations should be possible within a period of 12 months, with many delivered in a significantly shorter timescale. The single 'urgent' recommendation should be progressed immediately.

Step 6: Review

A formal review and progress reporting mechanism should be built into the action plan. This review process should be undertaken through the existing meeting and organisational structure; for example, monitoring progress on the recommendations could become an additional agenda item on the Safety Review Group.

Figure 7: Outline action plan

		Months				
Ref.	**Title**	**0 – 3**	**3 – 6**	**6 – 9**	**9 – 12**	**12+**
RSC						
RSC1 CL1	Staff field time and focus					
RSC2	Fill senior vacancies					
RSC3 RSC4	Review relocation, proactivity					
RSC7	Reissue safety case guidelines					
RSC5	Agree criteria for reporting					
RSC6	Challenge Risk Model					
DoT						
SMS1	DoT audit RSP projects					
DT1	Understand Risk Model					
DT2	Recruit railway professional					
IÉ – Safety Management System						
SMS1	Review budgets (Part A and C)					
SMS2	Maintain progress on RSP					
SMS3	Review / update Company Stds					
SMS4	Review mgt of Company Stds					
SMS5	Document control system					
SMS6	Briefing process for new stds					
SMS8	Strategy for technical stds					
SMS9	Implement Standard 2					
SMS10	Monitoring Standard workshop					

		Months				
Ref.	**Title**	**0 – 3**	**3 – 6**	**6 – 9**	**9 – 12**	**12+**
SMS11	Update / implement Std 4					
SMS12	Accident investigation process					
SMS13	Investigation skills training					
SMS14	Strengthen audit team / process					
SMS15	Clarify safety responsibilities					
SMS16	Specify comm. requirements					
SMS17	Method Statements guidance					
IÉ – Safety culture						
CL2	Drugs and alcohol policy					
CL4	Recording of near-misses					
IÉ – Network Risk Model						
NRM1	Review requirements					
NRM2,3	Competence, asset rating					
IÉ – Operations						
O1	Mobile phone use					
O2	Safety Statements					
O3	Safety Diaries					
O4/5/6	Training					

		Months				
Ref.	**Title**	**0 – 3**	**3 – 6**	**6 – 9**	**9 – 12**	**12+**
IÉ – Infrastructure						
ST1	Lookouts					
PW1	TSC role					
S2/3	Thoro' inspections, flood scour					
PW4	Roll out standards					
S1	Standards training programme					
S4	Outside party risks					
ST2	Maintenance standards					
ST3	Signalling fault system					
ST4	Inspect / maint. Records system					
IÉ – Rolling stock						
RS2/10	Approvals meth, safety defects					
RS1	High level SMS review					
RS3	EU Directives working party					
RS4	Safety instructions / drawings					
RS5/6	Meeting structure / protocol					
RS7	Training strategy					
RS8	Change management					
RS9	Train borne faults					

		Months				
Ref.	**Title**	**0 – 3**	**3 – 6**	**6 – 9**	**9 – 12**	**12+**
IÉ – Electrification						
E5	Fairview sidings					
E6	Earthing equipment					
E1	OCS standards					

Appendix A: Study methodology

Overview

The study involved a series of five main tasks, including a project kick-off meeting, and final reporting tasks.

Task 1: Kick off meeting

The study began with a kick off meeting with IRSC and IÉ, to clarify the working arrangements and schedule, and to gather information necessary for the assignment.

Task 2: Review of documentation, procedures and systems

We will review and identify apparent gaps to be explored later in interviews, against (1) recognised good practice, (2) the intent of the recommendations of the IRMS, and other existing reviews. We will also review how the Risk Model is used as a risk management tool to inform decisions and prioritisation. Whilst this is, of course, a critical step, we would highlight that systems alone do not deliver safety; safety is delivered by suitable organisation, processes and resources – held together by a supportive safety culture.

Task 3: Focused interviews with a 'diagonal slice' of IÉ and IRSC staff

We gathered the opinions of 72 IÉ staff, from the most senior levels of management to staff on the trackside, in our previous review of safety culture. We were therefore able to benefit from the very valuable set of data obtained, and supplement it with a series of focused interviews for this study. In particular, cultural aspects were covered very extensively, avoiding the need to repeat this exercise.

For this study, we interviewed all 7 RSC staff, 2 staff from the Department of Transport, and 72 staff from across IÉ, ranging from the Chief Executive and Professional Heads, to track gangs and local Safety Liaison Executives.

Task 4: Synthesis of findings to make practical recommendations for change

Following the interviews, we developed conclusions and prioritised recommendations for change based on our results from the above tasks. We prioritised actions as high, medium and low; prioritisation was developed on a basis of unreasonable risk, safety benefit and cost–safety benefit of change proposals.

To ensure good 'buy-in' at the appropriate senior levels, we ran a workshop to review the draft recommendations and action plan. This ensured that those with responsibility for delivering the change can contribute to the development of the action plan. There are often, also, a number of options available on how a programme is delivered, which were explored with IÉ to ensure that they are implementable.

Following the review workshop, we finalised the recommendations and action plan, with quantified timescales, prioritised actions against those responsible, and (where relevant) indicative costs.

Task 5: Reporting

At the completion of the assignment we provided a presentation of our draft recommendations (see Task 4), and produced a final report including the findings and agreed action plan.

Appendix B: Summary of recommendations

Railway Safety Commission

RSC1 **Staff field time**: The RSC need to ensure that their staff spend sufficient 'field time' to allow them to exercise their role effectively

To facilitate efficient access, the RSC should develop, with IÉ, a protocol for inspectors accessing railway infrastructure. This should cover both planned visits and unplanned emergency visits (for example where unsafe situations are reported)

RSC2 **Fill senior vacancies:** The RSC and Department of Transport should fill senior RSC vacancies as a matter of high priority, which may include a review of the attractiveness of the compensation packages to ensure high quality candidates are attracted. Until the Chief Investigator is appointed the Department will need to make temporary arrangements to ensure the requirements of European Railway Safety Directive (2004/49/EC) are met and that Ireland is effectively represented in railway accident investigation matters in Europe

RSC3 **Review implications of relocation:** The RSC should review the implications of the proposed relocation to Ballinasloe, considering the potentially adverse impact on the effectiveness of the process of regulatory oversight. The review should balance the potential cost savings of relocating staff out of Dublin, against the potentially increased difficulty of recruitment, and the impact on the efficiency and effectiveness of the core RSC role. This needs to be considered alongside recruitment (and retention plans)

RSC4 **Increase proactivity:** The Railway Safety Commission should move towards a more proactive and leading role, setting out clearly to IÉ how their core functions will work in practice. This will help to bring about a greater clarity to both parties regarding what the role will entail, and so allow IÉ to prepare for providing additional information as requested

RSC5 **Agree criteria for reporting:** The Railway Safety Commission should agree criteria with IÉ for the reporting of accident and incident data and investigation reports in advance of agreed criteria being published by the European Rail Agency

RSC6 **Effective challenge of Network Risk Model:** The Railway Safety Commission should decide what level of understanding it requires of the IÉ Network Risk Model to provide an effective challenge on the core risk assessments carried out by IÉ

RSC7 **Reissue safety case guidelines:** The Railway Safety Commission should update and re-issue the Guidelines for Railway Safety Cases:

- All references to the Railway Safety Bill 2001 and Railway Safety Authority should be updated to Railway Safety Act 2005 and Railway Safety Commission
- The structure of the guidelines must remain logical
- Ensure that the guidelines meet the requirements of the European Railway Safety Directive (2004/49/EC)
- Including Northern Ireland Railways as a Duty Holder
- Implement minor structural improvements as suggested in this report

In the meantime, all railway undertakings should continue to progress their safety cases for submission using the existing safety case guidelines

Department of Transport

DT1 **Improve understanding of risk model:** Department of Transport should obtain independent advice on the IÉ Network Risk Model development process and results to ensure it can provide effective challenge

DT2 **Recruit railway professional:** Department of Transport should consider recruiting a senior railway professional to increase the capability of the Department in promoting railway safety, and in checking that investment proposals are 'value for money'

Iarnród Éireann

SMS1 **Review budgets for Part A and Part C projects:** IÉ should review the allocated budgets across all 51 projects within Parts A and C of the Railway Safety Programme, and define more clearly project scope and objectives for projects which have not been fully completed. The revised budgets and project scopes should then be clearly reported to the DoT at a formal meeting, with the overall aim of increasing the level of understanding of progress and ensuring clear demonstration of 'value for money'

Depending on the outcome of the review, DoT could conduct an audit fo spend on Parts A and C of the Programme

SMS2 **Maintain progress on Railway Safety Programme:** In the absence of a dedicated Programme Coordinator, IÉ should strengthen and formalise regular reporting on projects under Parts A and C Railway Safety Programme, to help maintain progress and ensure projects deliver against defined scope and objectives. This could be achieved by the Chief Safety and Security Officer (who is responsible for delivery of the Safety Management component for the Programme) reporting at the Safety Review Group

SMS3 **Review and update Company Standards:** IÉ should review and update the Company Standards to include the following:

- Clarification and communication of exactly which aspects of the SMS are mandatory, and which are recommended good practice - where actual practices do not match the Standards, IÉ should either update the Standard, or put measures in place to improve compliance
- Reflect changes in the overall safety management arrangements, organisation, and regulatory system
- Consider the integration of Standards 1 and 9 to remove repetition and overlap

The review could usefully form a phased plan for implementation with specific milestones and deadlines (which could be referenced in the Safety Case)

IÉ should develop an implement a specific strategy for the Safety Management System in the Mechanical Engineering Department, to either align it with Company Standards, or define core requirements which must be followed and acceptable differences from the Company systems

SMS4 **Review management of Company Standards:** IÉ should review the process for managing and updating the ten Company Standards, to ensure it is practical to maintain. Specifically:

- Review of the Standards should be staggered over the three year review cycle, to manage the workload involved in review and update
- Changes made to the Standards during the review process should be logged in each Standard so there is a clear record of what has been updated

An issues log should be maintained for each Standard to ensure required changes are not missed during the periodic review. In addition, should an issues log reach a certain size, this should be a trigger for a review of the Standard, even if this occurs before the next periodic review is due

SMS5 **Document Control:** IÉ should finalise introduction of an electronic Controlled Documents System and ensure that all appropriate documents are either reissued or existing documents are endorsed accordingly. Where controlled documents are held on the company intranet but are likely to require hard copies, for example, to be used 'in the field', consideration will need to be given to how these are controlled

A comprehensive schedule of current standards, procedures and working instructions should be prepared and briefed to all staff to clearly identify their correct revision/issue and status

SMS6 **Clarify briefing process for new/updated standards:** IÉ should clarify the process for briefing out new standards, and briefing out revisions to existing standards, to all those to whom they apply. This should include a process for recording attendance at briefing sessions, and should be linked to the document management process (including logging changes to standards), to ensure all relevant staff receive copies of the new/revised standards

SMS7 **Improve Safety Briefings:** IÉ should improve the quality, rigour and consistency of safety briefings across all departments, including depots. To be effective, this will need to be led from Senior Management downwards through the hierarchy of briefings. A formal system for recording attendance to safety briefings should be introduced, in order that absent staff can be identified and briefed separately

SMS8 **Development of Technical Standards (Infrastructure):** IÉ should review the strategy for developing 250-300 Technical Standards in Infrastructure (recommendation 1.3.1 in Raiwlay Safety Programme 2004-8) to ensure that there will be sufficient resources for preparation, briefing, implementation, monitoring and updating. Note that the specialist supporting standards development for signalling is not yet in place, which may have further impact, and that current progress and future targets suggest the goal of 250-300 targets will not be achieved. IÉ and DoT should review the implications on the allocated budget if only half of these standards are to be produced, and modify it accordingly

The current target is based on the number of standards produced per annum - we would suggest that risk-based prioritisation would be more appropriate to plan the development of any Technical Standards

SMS9 **Implement Standard 2 (Safety Monitoring) across all departments:** IÉ should implement Standard 2 fully across the Infrastructure and Mechanical Engineering departments over the next twelve months, and appropriate resources should be provided (if necessary) to facilitate this. In accordance with the requirements of the Standard, monitoring should be risk-based

As part of the review of Standard 2, IÉ could consider reducing the bulk of the required paperwork, to ensure that the forms and checklists are appropriate for the activity being monitored

The implementation of the Standard should be appropriately audited

SMS10 **Workshop to discuss trends emerging from implementation of Monitoring Standard:** IÉ should hold a cross-departmental workshop periodically (e.g. annually) to discuss key themes and trends emerging from the monitoring process, and look at ways to improve common weaknesses. These could be integrated with the existing system of cross-functional safety seminars

These workshops should also include the audit team, both to input their findings based on the audit programme, and to help identify areas requiring a greater audit focus to bring up standards of implementation

SMS11 **Update and implement Standard 4:** IÉ should either update the Accident Investigation Standard to reflect current practice or put measures in place to ensure current practice is aligned with the requirements of the standard

During the routine review of the Accident Investigation Standard, several specific items should be improved:

- References to the Railway Safety Act (2005), the Railway Safety Commission, the Railway Incident Investigation Unit and the IÉ Safety Case should be added as appropriate
- The Standard should reflect European accident investigation requirements, and references added where appropriate
- Key terms (such as basic causes) should be defined in the Standard rather than via a reference to another standard
- The treatment of non-IÉ parties (e.g. Enterprise Services) should be defined in more detail
- Training and competence requirements for "Issuing Officers" should be defined
- The process for approval, implementation and tracking/monitoring of investigation recommendations should be clarified

SMS12 **Better define the future accident and incident investigation process:** IÉ should more clearly define the 2007 and 2008 objectives of Item SMS10.2 of the Railway Safety Programme, giving the number of investigators and investigations required against the allocated budget, and should implement this accordingly

SMS13 **Provide systematic training and coaching in investigation skills:** IÉ should provide systematic training and coaching in investigation skills and report writing (dependant on organisational structure decided for investigations and specified in revised Company Safety Standard) for all involved in the investigation process (Issuing Officers, authorised investigators, members of Safety review Group that review reports)

SMS14 **Strengthen the audit team and process:** IÉ should strengthen the audit team and process as a matter of highest priority. Specifically, they should:

- Appoint a Lead Auditor as soon as possible
- Put in place a structured audit programme for the coming year, based on a sound audit strategy (which should include consideration of the key audit elements shown in Figure 2)
- Move towards risk-based auditing
- Ensure recommendations are tracked and signed off

SMS15 **Clarify safety responsibilities:** IÉ should ensure that all staff who carry out safety critical and safety related tasks, are aware of their safety responsibilities. This should be delivered either through appropriate Job Descriptions/Safety Responsibility Statements (currently provided only for more senior positions), or for example through training and assessment against relevant sections of the Rule Book as part of a development of the broader Competence Management system (included in the Railway Safety Programme)

SMS16 **Specify communication requirements:** Specify communication requirements with respect to employment of contractors on railway sites. Specifically, the review should address communication requirements for safety courses, and for key safety personnel with respect to site safety briefings

SMS17 **Develop guidance notes and monitor use of Method Statements:** Develop standards and guidance notes pertaining to the use and preparation of method statements to give clear guidance on when they are required, their content and format

Monitor and audit the use of Method Statements to check for compliance with standards and procedures

CL1 **The RSC should focus on ground level compliance at first:** Given that there are acknowledged shortfalls in compliance with the SMS at ground level, the RSC should focus their attention in the first 6-12 months on a number of key issues related to implementation at ground level:

- Audit plan and implementation
- Implementation of Standard 2 (Monitoring) across all departments
- Safety briefings
- Competence management

Role of Track Safety Coordinators and Lookouts

CL2 **Drugs and alcohol policy:** IÉ should implement a new company policy for drugs and alcohol screening, including random and selective testing and appropriate consultation with staff, in line with the requirements of the Railway Safety Act

CL3 **Raise Awareness of CARA:** Raise the general awareness of CARA and encourage staff to use it. This could be tied into the "Don't Walk On By" campaign

CL4 **Recording of "near-misses":** IÉ should re-brief all staff on the requirement to record all "near-miss" incidents, and follow up through the internal monitoring and audit functions that this is being complied with

NRM1 **Development of Network Risk Model:** Development of Network Risk Model: Prior to reconvening the Task Force to propose funding for the third phase of the Railway Safety Programme (2009-2013), all parties concerned (DoT, IÉ and the RSC) will need to be assured that the level of risk predicted is reasonable and robust. The imminent work to benchmark and validate the results of the Model, and the review workshops that are planned could provide a key input to this process. Prior to further development of the Risk Model, IÉ (working with DoT and the RSC) should review requirements to ensure that the Model does not become overly complex for its intended use, and for the eventual handover of the management of the Model in-house. This should include consideration of how best to develop improved asset -specific risk modelling capabilities. An alternative to extending the asset modelling capabilities of the Network Risk Model would be to develop more straightforward and specific tools that might be more simply integrated into IÉ's decision-making processes, and which coexist alongside the Network Risk Model.

NRM2 **Develop in-house competence in Risk Model:** IÉ should plan for moving the Model 'in-house' to facilitate greater ownership and understanding of the Model. This may require broader training in risk assessment for staff who are to use the Model to help with decision-making, and should be considered in the skills required for any recruitment of staff to support the Risk Model

NRM3 **Review Asset Rating Guidance:** IÉ should review the Asset Rating system, including its interpretation by different individuals, to assess what additional measures may be required to improve consistency in application. Depending on the results of the review, this could result in improved training and guidance in asset rating, central checking of ratings provided by engineers in the field, or revision to the Asset Rating system

O1 **Review mobile phone use regulations:** IÉ should review the regulations regarding the use of mobile phones by train drivers, and consider allowing their use in specific situations if it is concluded that this would result in reduced overall risk

The use of mobile phones by drivers is a current area of debate in the UK, so IÉ may be able to benefit from the outputs of any research in this area

O2 **Improve Safety Statements by making them specific to location:** The Safety Department should brief all staff on the requirement to update the Safety Statement to make it relevant to the location. Compliance with this requirement should then be confirmed through the internal audit process

O3 **Rebrief staff on requirement to use Safety Diaries:** IÉ should re-brief relevant staff on the requirement to use Safety Diaries to record Safety Tours. Compliance with this requirement should then be confirmed through the internal audit and monitoring process

O4 **Review the number of trainers required at Inchicore:** The Manager Training should re-assess the number of trainers required at Inchicore, in view of training requirements forecast over the coming year, and should consider increasing the pool of trainers

O5 **Secure training attendance:** IÉ should ensure that staff are not removed from training to cover staff shortages elsewhere – this has been implemented locally in some areas, and should become a company wide requirement

O6 **Address consequential vacancies:** IÉ should review the recruitment process at the base level, to ensure that a suitable pool of candidates are available to recruit high quality train drivers in all areas of the network.

PW1 **Review, monitor and audit TSC role:** IÉ should review implementation of the TSC on the ground, including discussions as part of safety meetings/tool box talks by Safety Executives to highlight reasons for non-compliance with the Rule Book. Employees' understanding of the TSC role should be reinforced, including that once the TSC has set up the safe system of work, then they can also undertake work activities if appropriate

The central Audit Team should audit the effectiveness of the TSC process on site to reinforce these changes, and ensure any recommendations are followed up. In addition to audits, the function of the TSC should also be monitored for effectiveness

PW2 **Accident records log first aid:** Establish a system of first aid kit use booking, to capture any 'small' accidents, which could become serious, or could be part of a trend. This will identify additional PPE requirements, i.e. gloves, and reduce the chance of escalating illness

PW3 **Review the Frequency of track inspections:** Review the standards that dictate the frequency of track inspections, and determine if a reduced inspection regime on newly laid track would be appropriate

PW4 **Finalise preparation of new and revised standards and 'roll out':** Ensure that p-way standards that are completed are 'rolled out' at the earliest opportunity. Where a standard is new or introduces significant changes from a previous version, IÉ should carryout a 'controlled' briefing of the new standard or change to the affected staff (i.e. to ensure all relevant staff are briefed).

IÉ should clearly identify those who are responsible for briefing changes in standards to the workforce

S1 **Standards training programme:** Implement the planned training programme on the introduction of the new Standard for Structural Inspections

S2 **Programme of thorough inspections:** In accordance with the Standard for Structural Inspections (July 2005), ensure that a programme of 'Thorough Inspections' is started immediately and that adequate resources are available to undertake this exercise. This should include reviewing the competency and training requirements necessary to carry out such a programme of inspections. (Suggest led by Chief Engineer)

S3 **Flood scour management system:** Develop a flood/scour management system to ensure safety of structures at times of flood, including the conditions under which the track must be closed and may be re-opened. (Suggest led by Chief Engineer)

S4 **Review Outside Party work/risks:** Review the risk from Outside Party works and how IÉ manages this risk. This should include reviewing the resources required and consideration should be given to having a dedicated Outside Parties Engineer with a small team that would be responsible for this area of work.

ST1 **Provision of Lookouts:** Urgently address the issue of Lookout availability, to ensure that Lookouts are provided as consistent with Rule Book requirements. Consideration could be given to training of Signalling and Telecomms staff as Lookouts

ST2 **Issue maintenance standards:** Issue and brief out a complete suite of maintenance standards for SET

ST3 **Develop and formalise signalling fault system:** IÉ should extend the use of the Telecomms SAP R3 fault reporting and managing system, or similar, to develop a more effective and formal system for signalling faults

ST4 **Inspection and maintenance records system:** Implement a records system to ensure that inspection and maintenance activities are formally recorded with a clear and robust audit trail that demonstrates compliance with company procedures

RS1 **Gap analysis of high-level documentation:** IÉ should review the high-level safety documentation within the Mechanical Engineering Division to identify and resolve any risks and gaps that may necessitate change. This should be linked to a strategy for Mechanical Engineering's safety management system as a whole

RS2 **Review methodology for approvals:** IÉ should develop a formal methodology for approvals covering both new and existing vehicles. The methodology should include the documented process, formal certification and independent assessment of competencies of authorised signatories

RS3 **Working party EU Directives:** IÉ should form a working party to establish the effects of change to their safety management system from the introduction of the EU Directives relating to the acceptance of vehicles

RS4 **Depot management of safety instructions & drawings:** IÉ should brief staff at each location on the local instructions for managing maintenance and safety instructions and drawings. This should include the inter-relationships with SAP and, when available, application of an electronic drawing register

RS5 **Review meeting structure and remits:** Mechanical Engineering should clarify the structure for meetings, each with a defined remit. In particular, this should specify the format and scope of each meeting with respect to safety

RS6 **Protocol for depot safety meetings:** IÉ should develop and implement a protocol for safety meetings at all depots, linked to the company hierarchy of safety meetings. All safety related briefings to depot staff should be given to as collectively wide an audience as possible with sign off by those briefed

RS7 **Training strategy:** To build further on improvements to training, IÉ should review the training programme and strategy, with particular emphasis on the quality and scope. Development of the strategy, and ongoing content, should take into account the views of depot managers, and consider better use of local facilities to deliver improved training quality

RS8 **Change management:** IÉ should review current arrangements for management of change and brief staff on the requirements as defined in formal instructions

RS9 **Train-borne faults:** IÉ should conduct a review into current practice with regard to train crew intervention and corrective action, to ensure that overall safety and operational benefits are being optimised

RS10 **Management of safety related defects:** IÉ should develop a documented process for managing all safety related defects at the earliest opportunity. This should provide a means of rapid communication of reports by fax or similar to all listed depots/departments, the details of such incidents at the time of the initial report

E1 **Implement new OCS ETR Standards:** OCS ETR Standards should be implemented at the earliest opportunity. There are a number of important OCS Maintenance standards that have been drafted and are awaiting final review and it is recommended that this is given further impetus to complete

E2 **Improved reporting of OCS & traction faults:** It is recommended that refresher training is provided to remind control room staff of the importance of timely reporting of OCS and traction faults and the implications if this is not followed

E3 **Develop Processes for Private Subcontractors/Third Parties:** Should private contractors and third party organisations be engaged to undertake Electrification works on IÉ infrastructure, the following are recommended steps that should be taken to manage their activities:

- Develop a formal process with associated procedures to control safe access to the infrastructure including trackside and substations

Develop a process to assess the competency of sub-contractors to ensure their skill levels are sufficient to satisfactorily undertake the work safely and competently

E4 **Clearer Remits for Future Plant Procurement:** It is understood that IÉ are not planning to procure any further new Electrification maintenance plant for the time being. Should IÉ plan to introduce further new plant in the future it is recommended that a clearer remit should be agreed between IÉ and their consultant (if appointed) with the operational requirements of the maintenance organisation being the prime consideration rather than the practices of the UK industry

There are therefore no recommendations to add at the present time

E5 **Provide safe access to Fairview sidings:** We understand that authorisation has now been given for a footbridge to provide safe access to Fairview New Sidings. IÉ should put this in place as soon as possible, and ensure maintenance and operational staff use the bridge

E6 **Introduce earthing equipment management system:** It is recommended that a Management System is introduced which will identify and log new OCS earthing equipment and thereby enable future inspection and monitoring. This should help prevent occurrences where this equipment has been inadvertently damaged and not reported. Such a system should include a procedure to record and inspect the equipment and a process for disposal of damaged equipment

Appendix C. Interview protocols

Infrastructure and Engineering interview protocol

The overall aim of the study is to establish the 'adequacy' of railway safety at Iarnród Éireann, given the significant investment since 1999. The focus is very much on the implementation of Safety Management Systems and supporting processes in practice.

Preparation please read in advance:

- "Railway Safety Programme 2004 – 2008" in particular the sections that define the planned investment by assets/lines of routes etc.
- The second implementation review relevant to your area (P-way, Structures, Rolling Stock, S&T, Electrification)

Important notes:

- Any risks that are seen on site that are considered to be unacceptable must be reported at once
- All site visits must be carried out under escort of IÉ staff. All relevant safety procedures must be followed
- All interviews will be coordinated and planned centrally with ADL/IÉ - please do not make ad-hoc interview arrangements without central coordination
- Any problems contact Marcus Beard or Sarah Langslow at ADL: +44 870 336 6736/6752
- Please record all interview notes accurately. Be sure to confirm your understanding with the interviewee as the interview proceeds

0. Background

RECORD: Name/job title/Division or Department or Section/location of interview/time and date of interview

1. Safety Policy

A. Are you aware of the Divisional/Departmental safety **policy**?

B. Has the safety policy been **briefed** out?
   - **When** were you last briefed?
   - Did you sign to **confirm** your attendance?

C. How effective are the **briefing processes**?

D. Has there been any **feedback or questions/answers** on the safety policy?

2. Organisation

A. What are your **safety responsibilities**? [Ask to see copy of SRS/JD].

B. What safety **training** have you received? [Ask for copy of certificates]

C. Has your **competence** been **assessed, when and by whom**?

D. Do you have to hold any particular **certificates** and undergo a **medical**?

E. How would you rate the level of **resources** in your section/Division/Department? If there is a shortfall, is recruitment planned/underway?

F. Do you deal with the **Safety Department** (either Peter Cuffe's Department in Dublin or others)? If so, describe the interaction

G. Can you show me your departments Emergency Response Plan? [Ask for them to show you a copy]

H. Do you know who to contact in the event of an **emergency**?

I. Can you describe **supervision** on site?
   - How would you rate the quality and level of supervision on site?
   - How has this changed over the past (say) 5 years?

J. What do you know of and think about the **changes in organisational structure** at I.E. (e.g. the General Managers)?
   - Have they led to improved safety leadership and/or performance?

K. Is there a **Safety Liaison Ex**ecutive (or equivalent) within your section?
   - What is their role and function?
   - Are they effective?
   - What do you think about contractor safety?

3. Risk assessment/management

A. What do you think are the **highest safety risks** in your section/Division/Department?

B. **How do you know** where the highest risk areas are?

C. What **processes are in place to record and manage these risks**?

D. What do you know about the **I.E. Risk Model**? (I use it/I see and use results from it to make decisions/I have heard of it but don't use it/I have not heard of it)

E. If so, what are your views on the **I.E. Risk Model**?

F. Are you involved in **risk assessments**?

G. Which Workplace Safety Statements apply to your work. [Ask to see copies and note which they have direct access to]

H. How often have you seen Senior Management doing safety tours/inspections? (General Managers, Chief Executive, Chief Engineers etc)

4. Decision-making processes

A. What are the processes for **asset inspection**?
   - How regularly are they undertaken?
   - How is the frequency determined?
   - Who is responsible for carrying out inspections?

B. What is the **asset renewal** process?
   - How is it determined that renewal is required?
   - How are renewals prioritised?
   - Who is responsible for making the decision?

C. What is the process for **asset maintenance**?
   - What is the planning process?
   - How is routine maintenance scheduled?
   - How are repairs prioritised?
   - Who is responsible for this process?

D. What do you know about the IÉ **Safety Management System**?
   - What parts of the Safety Management System are you involved with?
   - What are your views on those parts of the Safety Management System that you are involved with?

E. Describe **how safety decisions are taken** in your section/Division/Department?

5. Railway Safety Programme 2004-2008[9]

A. Are you involved in managing any projects under the 2004 - 2008 Safety Programme? [If so, ask to see documents – project scope/progress tracking]?

B. How is **progress** monitored against the planned investment?

6. Review of performance

A. What **incident and accident data** do you gather (Synergi or other systems)?
   - What data is sent, how often and to whom?
   - How is accident/incident data used?
   - How and how often are data reviewed?
   - What is the process for actions arising from this review?

B. What **feedback** do you get on the data reporting process (e.g. trends etc?)

C. What are the **trends** in incidents/causes in your area of work?

7. Asset rating register (design/condition/deterioration)

A. Have you been involved in **rating assets (IAMs)**?

B. Who is **responsible** for assigning the ratings? Have you/ they been trained? [Ask for copy of their certificate]

C. Do you know what the ratings are **used for**?

D. Were the ratings given **checked** independently for consistency or **audited**?

E. What are **your views** on the rating system?

F. What happens when an asset is rated as below standard?

[9] Note this Iarnród Éireann document outlines the risk profile for the railway and the planned expenditure to address risk in the areas of Safety Management Systems, Asset renewal and maintenance, and human performance. It is important to understand the sections relevant to your audit in advance

When on site – please prepare with the interviewee a set of assets that you will visit and ask for the Asset Rating for these. During the site visit please give your view on the rating of the asset. If there are differences please discuss these with the interviewee.

8. Audits

A. What audits did you receive in the **last 12 months**?

B. **Who** undertakes the audits?

What are the **strengths and weaknesses of the audits** (e.g. usefulness, feedback and follow-up, frequency, competence of auditors, etc.)

9. Standards, rules and procedures

A. What are they **key standards, rules** and **procedures** that apply to you in your work? [Ask to see **up-to-date copies**]
B. Who is responsible for **implementing** them?
C. Do you carry out Monitoring/Checks/Inspections? [If yes – ask to see their specific responsibilities and to see records of it being used – this may be a simple notebook or more detailed checklists]
D. How are items identified in inspections closed-out? [Ask for example]
E. Are *your* activities inspected /monitored/checked? If so by whom?
F. Are Method Statements used for work? [Ask for examples] Who prepares these? Who is responsible for implementing them?

10. Rate of change

Please rate the change in the following within your section/Division/Department over the past 5 years? **(Range - - getting much worse, 0 no change, + + getting much better)**

Asset condition	- -	-	0	+	+ +
Safety leadership and commitment	- -	-	0	+	+ +
Attitude to safety on the ground	- -	-	0	+	+ +
Competency and staffing levels	- -	-	0	+	+ +
Data/incident reporting/investigation	- -	-	0	+	+ +
Procedures and processes - on paper	- -	-	0	+	+ +
Procedures and processes - implementation/compliance	- -	-	0	+	+ +

11. Wrap Up

A. Is there anything else you would like to add?

B. Remember to take away any relevant documents

C. “Thank you very much for your time”

Appendix D. List of interviewees

Table 2: List of interviewees – (Interim) Railway Safety Commission

Name	Position
John Welsby	Commissioner
Anthony Byrne	Senior Inspector
Linda Byrne	Executive Officer
Donal Casey	Senior Inspector
Catriona Keenahan	Office Manager
Cliodhna Loughney	Inspector
Mary Molloy	Principal Inspector

Table 3: List of interviewees – Department of Transport

Name	Position
Mairead Broderick	Assistant to Principal, Rail Safety & Investment
Pat Mangan	Assistant Secretary, responsible for Transport 21

Table 4: List of interviewees – Iarnród Éireann

Name	Position
Liam Armstrong	Shift Electrician
Dave Aspell	Assistant Divisional Engineer (Track & Structures)
Darren Bowe	Duty Manager CTC
Audrey Bradley	Safety Case Manager
Tony Burke	Signal Technician
Sean Burns	Assistant Divisional Engineer (Signalling)
Robin Byrne	Traction Foreman
Cal Carmichael	General Manager, North and East
Fand Cooney	HQ Senior Engineer (Structures)
Paddy Connolly	Steel Bridge Foreman
Christie Conway	Acting SMS
Bertie Corbett	Professional Head of Operations
Sean Corbett	S&E Supervisor, Limerick Junction
AJ Cronin	District Manager, Cork
Peter Cuffe	Chief Safety and Security Officer
Therese Dean	Safety Liaison Executive, Cork
Fintan Devitt	Fleet Manager (DART)
Tom Devoy	General Manager, DART
John Downey	PW Mobile Ganger
Kaye Doyle	Operations Safety Manager
Eugene Egan	Auditor
Dick Fearn	CEO (Acting CEO at time of interview)
Ronan Finlayson	Telecoms Engineer
Brian Garvey	Chief Engineer, Infrastructure
Gerry Glynn	District Manager, Galway
Matt Green	Assistant Divisional Engineer (Track & Structures)
John Haughey	Assistant Chief Engineer, Infrastructure
John Keenan	Director Strategy and Business Development
Padraig Kelly	Safety & Quality Manager, Mechanical Engineering
Joe Leahy	Director New Works
Michael Leonard	PW Inspector
Bob Love	Buildings Manager, Pearse
Brian Lucas	Divisional Engineer, Athlone

Name	Position
Damien Lynch	Signal Technician
Niall Lynch	Divisional Engineer, Limerick Junction
Richie Mackie	Assistant Fleet Manager (DART)
Paddy Mangan	Technical Assistant Bridges
Ciaran Masterson	District Manager, Connolley
John McCarthy	Chief Mechanical Engineer
Brendan McCormack	Chief PW Inspector
Mick McDermot	Bridge Inspector/ Senior Engineer
Dermott McEvoy	Acting Mobile Ganger (Track)
Noel McKenna	District Manager, Heuston
Bernard McLoughlin	Signal Maintenance Supervisor
Jimmy Meade	District Manager, Limerick
Liam Meagher	Divisional Engineer, Dublin
Peter Muldoon	HQ Structure Engineer
John Mullin	Safety Manager, Infrastructure
Declan Murphy	Traction Engineer
Liam Murphy	HQ Manager Facilities and Buildings
Stephen Murphy	General Manager, South and West
John Naughton	Suburban Engineer
Cormac Nolan	Safety Executive
Pat O'Brien	Auditor
Kieran O'Donnell	Principal Engineer Track and Structures
Richard O'Farrell	Chief Financial Officer
Anthony O'Gorman	PW Mobile Ganger
Pat O'Leary	Safety Performance Manager
Paraic O'Lochlainn	Principal Engineer (Signalling & Power)
John O'Mahoney	Chief PW Inspector
Barry O'Riordan	Technical Assistant
Willie Pierce	Procurement, Infrastructure
John Quinn	Chargehand Electrician
Shay Quinn	Chief PW Inspector
Stuart Rendell	Senior Technical Executive, Signalling, Athlone
Jim Ryan	District Traction Executive, Cork
John Sheedy	Bridge Maintenance Foreman
Brendan Slaughter	Chargehand Electrician

Name	Position
Jo Stenson	PW Inspector
Peter Tuohy	Chief Investigator
Ed Walsh	Telecoms Supervisor
Nick West	Assistant Divisional Engineer (Track & Structures)

Appendix E: Operational elements of DART system

The principal operational and maintenance elements of the DART system are:

- The 1500V dc Overhead Contact System (OCS). The operation and maintenance of the OCS element of the DART system falls upon the Dublin Division based at Pearse Station offices. Responsibility for OCS maintenance rests with Mr. Barry O'Riordan the Technical Assistant
- Fairview Train Maintenance Depot. In the context of this safety review only the isolation and earthing of the OCS within the depot complex was considered. A review of the current practice of isolation of the OCS within the depot was completed and compared with the practices observed during previous reviews
- Central Traffic Control (CTC). CTC at Connolly Station in Dublin contains 2 principal operational sections. The Regulator (or Signaller), who is responsible for Regulation of train services and the Electrical Control Operator (ECO), who is responsible for the remote operation and monitoring of 20 d.c. substations and Track Paralleling Huts (TPH's) on the DART system. The ECO is additionally responsible for the provision of planned isolations of the OCS as part of infrastructure maintenance and refurbishment of the OCS system together with emergency isolations where required
- The Electrical Traction Supply System. The organisational structure of the electrical traction supply system is as follows: