Railway Accident Investigation Unit of Ireland

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Foreword

The purpose of the Railway Accident Investigation Unit (RAIU) is to independently investigate occurrences on Irish railways with a view to establishing their cause and make recommendations to prevent their reoccurrence or otherwise improve railway safety.

Forty-seven preliminary examinations were carried out in 2014; from which two full investigations were commenced. Two of these investigation involved vehicle collisions at level crossings.

The RAIU published six investigations reports in 2014 relating to five occurrences that took place in 2013 and one trend investigation dating back to 2012. The 2013 investigations were as follows:

- Trend investigation on possession incidents;
- Operational Irregularity during SLW between Dundalk & Newry, 22nd March 2013;
- DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013;
- Tram fire on approach to Busáras Luas Stop, 7th November 2013
- Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013;
- Rock fall at Plunkett Station, Waterford, 31st December 2013.

A total of twenty-seven new safety recommendations were issued as a result of these investigations, in 2014. The focus of the safety recommendations were: the effective implementation of safety controls; improvements to competency management systems; and the management of risk at user worked level crossings. In addition to the above investigation, the investigation into Signals Passed at Danger (SPADs), which commenced in 2013 continued throughout 2014, and is likely to be published in late 2015.

As of the end of 2014, the RAIU have issued a total of 113 safety recommendations since the appointment of a Chief Investigator for the Railway Accident Investigation Unit in 2007. In addition, the Railway Safety Commission (RSC) issued in total of fourteen safety recommendations up to the end of 2007; the RSC monitors the implementation of safety recommendations and has advised that of the 127 safety recommendations issued to date (both by the RAIU and the RSC), sixty-three have been closed out as having been addressed, thirty-three are complete and awaiting verification that they have been addressed, and a further thirty-one remain open.

A position for a Senior Investigator became vacant in October 2012. However, the RAIU were only given sanction to fill the post in November 2014. The shortfall in resources continues to be an ongoing concern.

David Murton
Chief Investigator

Contents

1 Background 6
2 RAIU 7
2.1 The organisation 7
2.2 Railway networks within the RAIU's remit 7
2.3 Non-investigative activities 9
3 Occurrences 10
3.1 Classification of occurrences 10
3.2 Investigation of occurrences 10
3.3 Summary of occurrences in 2014 12
3.4 Investigations within the past five years 12
4 2014 Investigations 15
4.1 Investigations commenced in 2014 15
4.1.1 Vehicle struck by train at Corraun Level Crossing, XX024 15
4.1.2 Car strikes train at Knockaphunta Level Crossing, XM 250 16
4.2 Investigations which continued through 2014 17
4.2.1 SPAD occurrences on IÉ network 17
5 Investigation reports published in 2014 19
5.1 Overview of investigation reports for 2014 19
5.2 Trend Investigation: Possession incidents on the IÉ network 19
5.3 Operating irregularity during Single Line Working between Dundalk and Newry 20
5.4 DART Wrongside Door Failure, Salthill & Monkstown Station 22
5.5 Tram fire on approach to Busáras Luas Stop 24
5.6 Structural Failure of a platform canopy at Kent Station, Cork 27
5.7 Rock fall at Plunkett Station, Waterford 28
6 Safety recommendations 31
6.1 Monitoring of RAIU safety recommendations 31
6.2 Summary of status of recommendations 32
6.3 Progress in 2014 33
Appendix A – Status of individual recommendations in 2014 (Open/ Complete/ Closed) 34
Status of individual recommendations by report – 2006 34
Status of individual recommendations by report – 2008 36
Status of individual recommendations by report – 2009 37
Status of individual recommendations by report - 2010 38
Status of individual recommendations by report - 2011 41
Status of individual recommendations by report – 2012 46
Status of individual recommendations by report – 2013 48
Status of individual recommendations by report – 2014 50
Appendix B – Investigations with recommendations closed prior to 2014 56

List of abbreviations

ERA	European Railway Agency
IÉ	Iarnród Éireann
IM	Infrastructure Manager
NIB	National Investigation Body
NSA	National Safety Authority
RAIU	Railway Accident Investigation Unit
RSC	Railway Safety Commission
RU	Railway Undertaking
SI	Statutory Instrument
SPAD	Signal Passed at Danger

List of Figures

Figure 1 – Organisation Chart for the RAIU 7
Figure 2 – Preliminary examination reports in 2014 by network 12
Figure 3 – Full investigations within the past five years, by type 13
Figure 4 – Five year average (2009 – 2014) by occurrence type 14
Figure 5 – Vehicle struck by train at Corraun Level Crossing, XX024 15
Figure 6 – Car strikes train at Level Crossing, XM 250, Knockaphunta 16
Figure 7 – Damaged autocoupler 22
Figure 8 – Fire on LUAS 24
Figure 9 – Canopy collapse 27
Figure 10 – Rockfall at Waterford Station 29
Figure 11 – Recommendation status descriptions 31
Figure 12 – Status of recommendations by year 32
Figure 13 – Status of recommendations in 2013 33
Figure 14 – Status of recommendations in 2014 33

1 Background

In April 2004, the European Parliament passed 'Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification'. This directive is referred to as the Railway Safety Directive and set out the requirement for each European Union member state to establish a National Safety Authority (NSA) to oversee the regulation of railway safety and a National Investigation Body (NIB) to act as an independent accident investigation body.

The Railway Safety Act 2005 was passed on the 23rd December 2005, transposing the Railway Safety Directive into national legislation and creating the framework for the establishment of the Railway Safety Commission (RSC). On the 1st January 2006 the RSC was established transferring the regulation of railway safety from the then Department of Transport. The Railway Safety Act 2005 established the RSC to act as the NSA and perform the duties outlined in the Railway Safety Directive associated with the licensing of railways. The Railway Accident Investigation Unit (RAIU) was established as a functionally independent unit within the RSC to act as the NIB, independently investigating railway occurrences. The roles of the RSC and the RAIU were subsequently elaborated upon under the European Communities (Railway Safety) Regulations 2008, Statutory Instrument number 61 of 2008 (SI no. 61 of 2008) dated the 6th March 2008.

In July 2014, S.I. No. 258 of 2014, the European Union (Railway Safety) (Reporting and Investigation of Serious Accidents, Accidents and Incidents) Regulations 2014 was enacted. The purpose of these Regulations was to restate the national law that gives effect to Chapter V of Directive 2004/49/EC on safety of the Community's railways. Chapter V provides for railway accident and incident investigation and reporting. These Regulations provide for the establishment, of the national investigation body, the Railway Accident Investigation Unit, in the Department of Transport, Tourism and Sport to investigate railway accidents and incidents in accordance with these Regulations. Prior to these Regulations, the Railway Accident Investigation Unit operated in accordance with the Railway Safety Act 2005 as amended by the European Communities (Railway Safety) Regulations 2008 (S.I. No. 61 of 2008). These Regulations replace and repeal the provisions for investigation of accidents and incidents by the Railway Accident Investigation Unit under that Act and make some consequential amendments to that Act

The purpose of an investigation by the RAIU is to improve railway safety by establishing, in so far as possible, the cause or causes of an accident or incident with a view to making safety recommendations for the avoidance of accidents in the future, or otherwise for the improvement of railway safety. It is not the purpose of an investigation to attribute blame or liability.

2 RAIU

2.1 The organisation

The RAIU was established as an independent unit within the Department of Transport, Tourism and Sport, in mid-2014 through S.I. 258 of 2014. The RAIU comprises a Chief Investigator and a team of three investigators (two Senior Investigators and one Investigator), each with the ability to perform the role of Investigator in Charge, as necessary. One of the Senior Investigator positions became vacant in October 2012, and as of the end of 2014 had not been filled. The RAIU also has an administrator assigned to the unit. The organisation chart for the RAIU is shown in Figure 1.

Figure 1 – Organisation Chart for the RAIU

2.2 Railway networks within the RAIU's remit

There are ten railway systems within the RAIU's remit. These are:

- The Iarnród Éireann (IÉ) national heavy rail network;
- The Luas light rail system in Dublin;
- The Bord Na Móna industrial railway;
- Seven heritage railway systems.

For each of these railway systems there are entities identified as Railway Undertakings (RUs) and Infrastructure Managers (IMs). RUs are defined as organisations that provide the transport of goods and/or passengers by rail on the basis that the undertaking must ensure traction, including undertakings that provide traction only; which operate under a safety management system (SMS) approved by the RSC through the issue of a safety certificate. IMs are defined as organisations that establish and maintain railway infrastructure, including the management of infrastructure control and safety systems; which operate under a SMS approved by the RSC through the issue of a safety authorisation. There are ten organisations that act as RU and IM for a railway network and two organisations that act solely as RUs; there are currently no organisations that act solely as an IM.

The national heavy rail system is owned by IÉ, within IÉ there are separate IM and RU Business Divisions. The heavy rail system is interoperable with the heavy rail system in Northern Ireland and cross border services are operated by IÉ in conjunction with Translink, the RU in Northern Ireland. These operations are carried out under IÉ's Safety Case and Translink is classified as a guest operator. A heritage RU, the Railway Preservation Society of Ireland, also operates steam trains on the heavy rail system several times a year. The performance of the national heavy rail system is reported to the European Railway Agency (ERA) in accordance with European reporting requirements.

The Luas light rail system is owned by the Railway Procurement Agency. Transdev Transport is the RU that operates passenger services, the passenger stops and the Central Control Room. Transdev is also the IM responsible for the maintenance of the infrastructure.

The Bord Na Móna industrial railway is owned and operated by Bord Na Móna, acting as the RU and IM for the transport of peat on its network. As this is an industrial railway and does not carry passengers it only falls within the RAIU's remit where the railway interfaces with the public, such as at level crossings and bridges.

The operational heritage railway systems in 2014 included: Cavan and Leitrim Railway; Difflin Railway; Fintown Railway; Irish Steam Preservation Society; Lartigue Monorailway; Waterford and Suir Valley Railway; and West Clare Railway. Each of these acts as the RU and IM for their system.

2.3 Non-investigative activities

As part of its role as an NIB, the RAIU actively participates in the development of accident investigation processes and procedures through the work of ERA. To this end, the RAIU participated in the 2014 NIB plenary meetings and provided input on the direction of NIB related work. RAIU is also a member of the ERA taskforce set up to develop a system of cross auditing for the NIBs.

The RAIU attended the International Railway Safety Conference, as part of this event, continued to engage with NIBs from other countries.

The RAIU continues to participate in Memorandums of Understanding with the Transportation Safety Board of Canada, the Rail Accident Investigation Board of the United Kingdom of Great Britain and Northern Ireland and with the Health and Safety Authority.

The RAIU also continued to work actively towards the establishing of Memorandums of Understandings with both An Garda Síochána and the Coroner's Society of Ireland.

3 Occurrences

3.1 Classification of occurrences

Occurrences fall into one of three types as defined in S.I. 258 of 2014:

- Accident – An unwanted or unintended sudden event or a specific chain of such events which have harmful consequences including collisions, derailments, level crossing accidents, accidents to persons caused by rolling stock in motion, fires and others;
- Serious accident – Any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway safety regulation or the management of safety;
- Incident – Any occurrence, other than an accident or serious accident, associated with the operation of trains and affecting the safety of operation.

For clarity the meaning of the following terms should be noted:

- Harmful consequences – Injury to persons and/or damage to equipment;
- Serious injury – Any injury requiring hospitalisation for over 24 hours.

3.2 Investigation of occurrences

The RAIU have investigators on call, twenty-four hours a day, seven days a week, who are notified of reportable occurrences by the RUs in accordance with the S.I. 258 of 2014. Based on the nature of the occurrence and the legal requirements, a decision is made on whether or not an investigation is required. In accordance with the Railway Safety Directive, the RAIU must investigate serious accidents; accidents and incidents are investigated depending on the potential for safety lessons to be learnt.

Where notified occurrences warrant further investigation to determine whether or not an investigation is warranted a preliminary examination is carried out and one of the following three determinations is made:

- No further investigation – no safety improvements are likely to be identified that could have prevented the occurrence or otherwise improve railway safety;
- Full investigation – there is clear evidence that the occurrence could have been prevented or the severity of the outcome could have been mitigated through the actions of those parties involved either directly or indirectly in the installation, operation and maintenance of the railway;
- Full investigation (Trend) – where the occurrence is part of a group of related occurrences that may or may not have warranted an investigation as individual occurrences, but the apparent trend warrants investigation.

Investigations are classified as one of three types under the Railway Safety Directive:

- Article 19(1) – Investigations into serious accidents on the IÉ network, the objective of which is possible improvement of railway safety and the prevention of accidents;
- Article 19(2) – Investigation into accidents and incidents, which under slightly different conditions might have led to serious accidents on the IÉ network;
- Article 21(6) – Investigations into railway accidents and incidents under national legislation, this includes all investigations relating to the Luas light rail system, the Bord Na Móna industrial railway and the heritage railways.

For each investigation, the level of damage to rolling stock, track, other installations or environment is identified and classified based on the European common safety indicators as follows:

- None;
- Less than €150,000 (<€150,000);
- Equal to or greater than €150,000 (≥€150,000);
- Equal to or greater than €2,000,000 (≥€2,000,000).

Within seven days of a decision to carry out a full investigation, the RAIU advise the relevant railway undertaking of the decision. In accordance with S.I. 258 of 2014, the RAIU also notify the ERA within seven days of a decision to carry out a full investigation into an occurrence on the IÉ network.

The RSC, An Garda Síochána, the Health and Safety Authority and other organisations may carry out investigations in parallel with an RAIU investigation. The RAIU will share its own technical information with these Investigation Bodies, however, the investigations are carried out independently. Based on its investigation, the RAIU produce a report that is provided to all relevant parties, including the Railway Undertaking, the RSC and the Department of Transport, Tourism and Sport. Reports relating to the IÉ network are also provided to ERA. All investigation reports are made available in the public domain once they have been published.

In accordance with S.I. 258 of 2014, for all occurrences notified to the RAIU the relevant railway must carry out an investigation and produce a report within six months.

3.3 Summary of occurrences in 2014

There were forty-seven preliminary examinations carried out in 2014; these are broken down into serious accidents (these include acts of deliberate self-harm which resulted in fatalities), accidents and incidents, by network, see Figure 2.

From the preliminary examination reports produced, six full investigations were commenced; these are detailed in Section 4.

Railway Organisation	Serious Accidents	Accidents	Incidents
IÉ (RU/IM)	7	14	12
Luas	0	12	2
Heritage railways	0	0	0
Bord Na Móna	0	0	0
Total	7	26	14

Figure 2 – Preliminary examination reports in 2014 by network

3.4 Investigations within the past five years

Figure 3 shows the areas that have been examined through the RAIU investigations by occurrence type over the past five years; the occurrences are presented for all railways.

Occurrence		Year					5 year average	
Type	**Subset**	2010	2011	2012	2013	2014	**Total**	**%**
Serious accident	Serious Accident - Collisions	0	0	0	0	0	0	0.00
	Serious Accident - Derailments	0	0	0	0	0	0	0.00
	Serious Accident - Level crossing	2	0	0	0	0	2	7.69
	Serious Accident - To persons due to rolling stock in motion	0	0	0	0	0	0	0.00
	Serious Accident - Fires	0	0	0	0	0	0	0.00
	Serious Accident - Others	0	0	0	0	0	0	0.00
Accident	Accident - Collisions	0	1	0	0	0	1	3.85
	Accident - Derailments	2	0	1	0	0	3	11.54
	Accident - Level crossing	2	1	1	0	2	6	23.08
	Accident - To persons due to rolling stock in motion	0	0	0	0	0	0	0.00
	Accident - Fires	0	0	0	1	0	1	3.85
	Accident - Others	1	1	1	2	0	5	19.23
Incident	Incident - Infrastructure	0	0	0	0	0	0	0.00
	Incident - Energy	0	0	0	0	0	0	0.00
	Incident - Control-command & signalling	0	0	0	1	0	1	3.85
	Incident - Rolling stock	0	0	0	1	0	1	3.85
	Incident - Traffic operation & management	0	0	0	2	0	2	7.69
	Incident - Others	0	0	4	0	0	4	15.38
Annual Total		7	3	7	7	2	26	**100**

Figure 3 – Full investigations within the past five years, by type

Figure 4 shows the RAIU's investigations by type for 2014, diagrammatically, and for the past five years. Occurrences at level crossings remain the main focus of RAIU's investigations over the last five years.

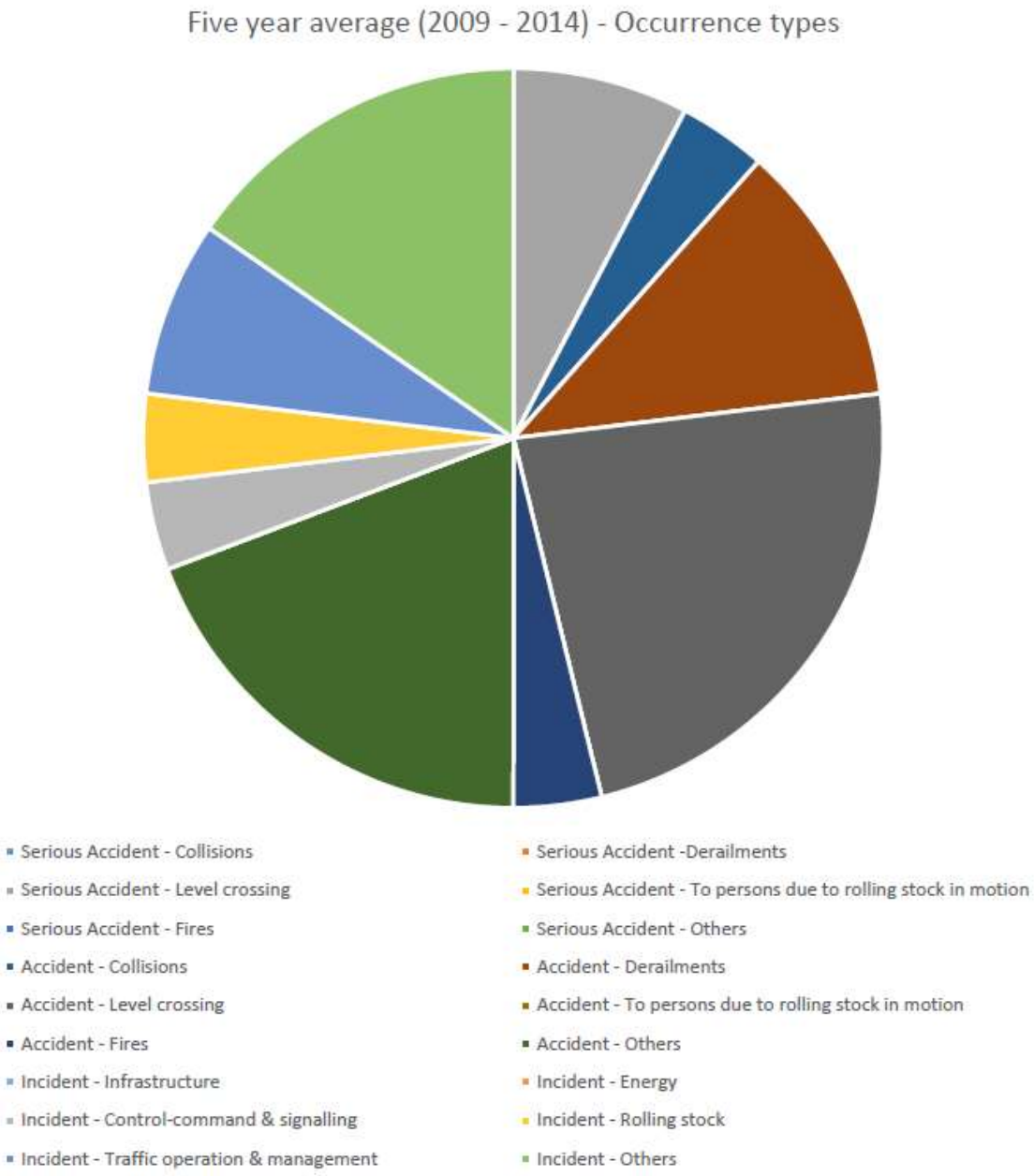

Figure 4 – Five year average (2009 – 2014) by occurrence type

4 2014 Investigations

4.1 Investigations commenced in 2014

4.1.1 Vehicle struck by train at Corraun Level Crossing, XX024

At approximately 09:55 hours (hrs) on Wednesday, 12th February 2014, an An Post van approached Corraun Level Crossing with the level crossing gates open and drove onto the Level Crossing. At the same time, the 09:35 hrs IE passenger service from Ballina to Manulla Junction was travelling through Corraun Level Crossing and struck the van. On impact, the van was thrown clear of the train and into the adjacent drainage ditch before coming to a stop, see Figure 5.

As a result of the accident, the van driver sustained six fractured ribs, fractured nose and eye socket, chipped shinbone and an injury to his left leg. There were no injuries to the six passengers and two members of IÉ staff on board the train at the time of the accident.

Occurrence classification:
Accident
Subset:
Level Crossing Collision
Investigation classification:
Article 19(2)
Fatalities and injuries:
One serious injury
Damage:
None

Figure 5 – Vehicle struck by train at Corraun Level Crossing, XX024

4.1.2 Car strikes train at Knockaphunta Level Crossing, XM 250

At approximately 18:42 hrs on Sunday 8th June 2014, the 15:35 hrs passenger service from Heuston Station (Dublin) to Westport (Mayo) was approaching Knockaphunta level crossing (asset number XM 250), situated at Knockaphunta, near Castlebar Co. Mayo when a Toyota Auris approached the level crossing from the Castlebar direction. As the train travelled through the level crossing, the car drove onto the level crossing and into the side of the train. The car was thrown clear by the impact and into the adjacent drainage ditch next to the level crossing, see Figure 6.

The single occupant of the car was cut free from the wreckage by the emergency services and conveyed to Mayo General Hospital, Castlebar. The driver of the car was not seriously injured and was released from hospital after treatment.

Occurrence classification:
Accident
Subset:
Level Crossing Collision
Investigation classification:
Article 19(2)
Fatalities and injuries:
None
Damage:
None

Figure 6 – Car strikes train at Level Crossing, XM 250, Knockaphunta

4.2 Investigations which continued through 2014

4.2.1 SPAD occurrences on IÉ network

As outlined in the 2013 Annual Report, on the 8th December 2013, the IÉ 11:50 hrs passenger service from Tralee to Heuston (Train A303) was running late. In an effort to minimise delays, the Centralised Traffic Control (CTC) Signalman and the Traffic Regulator made the decision to change the crossing point of Train A303 and the 12:10 hrs Cork to Tralee passenger service (Train A304) to Millstreet Station (Cork), instead of Banteer Station (the routes are on a bi-directional single line track with crossing loops). It was expected that Train A304 would arrive first at Millstreet Station, disembark passengers and shunt into the crossing loop. However, both trains approached Millstreet Station at the same time. As Train A303 approached Millstreet Station, Train A303 passed signal TL223 at danger without authority, which is commonly referred to in the railway industry as a Signal Passed at Danger (SPAD). The SPAD resulted in the two trains occupying the same section of line, travelling towards each other, until the CTC Signalman put out a general call for the trains to stop. Both train drivers applied the brakes and the trains came to a stop 175 metres (m) apart on the platform at Millstreet Station. IÉ awarded a SPAD Risk Ranking (SRR) of 21 to this Category A SPAD; therefore categorising it as a high risk SPAD.

Eleven days later on the 19th December 2013, in Gortavogher (County Clare), lightning strikes resulted in signal and level crossing equipment failures. The touch screen in the Mallow level crossing control centre (LCCC) was showing blanks for a number of signals at the level crossings in the area and as a result the Galway Line Signalman (GLS) and the level crossing control operative (LCCO) despatched emergency operatives (EOs) to the level crossings to assess and manage the level crossings. The LCCO did not inform the GLS not to allow any trains to enter the section until the EOs were onsite and in control of the level crossings. As a result the GLS informed the driver (Driver A780) of the 05:55 hrs passenger service from Limerick to Galway (Train A780), while he was in Ennis that there were faults with the level crossings which would be managed by EOs and gave the Driver A780 the proceed aspect to enter the section. As Driver A780 approached the first level crossing with reported faults (XE071) he stopped at the distant signal until the EO cleared the signals and Driver A780 travelled through the level crossing without incident. However, the signals at the next level crossing with reported faults (XE098) were not illuminated and Driver A780 only became aware of the situation when it was too late to stop in advance of the signal and level crossing and travelled through the level crossing with the barriers raised to road traffic (the EO was onsite but had not taken local control of the level crossing). Due to issues with the train radio operating in the cab (also as a result of the lightning strikes), Driver A780 travelled for a further eleven kilometres (km) before coming to a stop. IÉ assigned an SRR of 18 to this Category A SPAD; therefore categorising it as a medium risk SPAD.

Given the seriousness of the SPAD incidents at Millstreet and Gortavogher in 2013, full investigations were carried out into these incidents. In addition, as a result of these two incidents, the RAIU decided to review all Category A SPAD (Low – High) incidents over a three and a half year period, from

January 2012 to July 2015, inclusive; in total forty-two SPAD incidents. The initial review of the SPADs discovered that there were a high number of Start against Signal (SAS) SPADs and Start on Yellow (SOY) SPADs. As a case study into this type of SPAD, a full investigation was carried out on the SAS SPAD with the highest SRR (17) in 2013, the SAS SPAD at Muine Bheag on the 9th April 2013 which is described below (it should be noted that after this initial review there was the occurrence of SAS SPAD with a SRR of 20, making it a high risk SPAD, in January 2015).

In relation to the SAS SPAD at Muine Bheag on the 9th April 2013, the following occurred. At approximately 11:19 hrs, the 10:15 hrs passenger service form Heuston to Waterford (Train A504) approached Muine Bheag Station with signals WLR161 and WL161 displaying double yellow and single yellow aspects, respectively. This signalling sequence was due to, Signal WL167 (on the exit of the station) displaying a red aspect, as a Track Recording Vehicle (TRV) was due to cross Train A504 at Muine Bheag Station.

Train A504 was travelling with a driver (Driver A505) and trainee driver. After performing a number of platform duties, such as ensuring all passengers disembarked and boarded the train safely, the Person in Charge (PIC) gave the 'Station Works Complete' and the 'Ready to Start' signals despite seeing that Signal WL167 was at danger. The trainee driver saw the PIC give these signals as he was looking out of the cab window and Driver A505 watched the PIC give the signals on the in-cab Man Machine Interface (MMI) screen. Driver A505 did not look at Signal WL167, which is positioned approximately 215 m off Muine Bheag Station Platform.

Driver A505 then departing Muine Bheag Station and on approaching Signal WL167 saw that Signal WL167 was displaying a red aspect and immediately applied the emergency brake, coming to a stop a short distance past Signal WL167. The signalman contacted Driver A505 on the train radio to inform him he had passed Signal WL167 at danger and not to move the train.

5 Investigation reports published in 2014

5.1 Overview of investigation reports for 2014

The RAIU published six investigation reports in 2014, which resulted in a total of twenty-seven new safety recommendations; these investigations are outlined below:

- Trend investigation on possession incidents;
- Operational Irregularity during SLW between Dundalk & Newry, 22nd March 2013;
- DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013;
- Tram fire on approach to Busáras Luas Stop, 7th November 2013
- Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013;
- Rock fall at Plunkett Station, Waterford, 31st December 2013.

5.2 Trend Investigation: Possession incidents on the IÉ network

In 2012, IÉ had four possession related incidents within the space of one week. These incidents led to the RAIU to initiate a trend investigation on the 27th February 2012. The scope of the trend investigation included the four aforementioned incidents and all other relevant reported possession incidents that occurred between January 2009 and January 2013.

Initial analysis of these incidents identified recurring issues with possession planning therefore this investigation has focused on the management and execution of possession planning. Due to the recurring nature of these issues the RAIU have also examined how IÉ manage internal post incident recommendations previously made in the area of possession management. Contributory factors in relation to possession incidents identified were:

- The Control Room Process is not fully adhered to in all meetings in that the protection arrangements associated with the occupational safety risks are not discussed;
- The continued planning and implementation of Back-to-Back possessions has introduced practices that are non-compliant with prescribed instructions in the IÉ Rule Book for fog signal protection;
- The consistent booking of pre-established possessions with regards to work, limits and duration has led to possession protection being arranged to coincide with these limits instead of an assessment taking place on a site by site basis;
- The Weekly Circular is currently ineffective for communicating actual works that are to be undertaken on a given day/night due to the current practices of booking and cancelling of possessions;
- Late alterations to possession arrangements are not always communicated to relevant staff and have also in some cases led to inadequate possession protection.

The underlying factors were:

- There is no standardised procedure on the requirements and frequency of possession planning meetings and prescribing staff to be involved;
- The procedure for closing out IÉ recommendations has not been effective with regards to planning and Back-to-Back possessions.

The RAIU has made six new safety recommendations as a result of this investigation:

- IÉ (Infrastructure Manager) should develop a formal possession planning meeting framework that is consistent through the IÉ network;
- IÉ (Infrastructure Manager) should review the application of Back-to-Back possessions and implement actions to eliminate any informal practices that do not comply with IÉ Rule Book;
- IÉ (Infrastructure Manager) should establish a possession planning procedure that ensures protection arrangements are based on the work to be delivered and are verified by a suitable member of staff and formally communicated to all relevant personnel;
- IÉ (Infrastructure Manager) should monitor and review entries into Section "Engineering works requiring absolute possessions – Section T Part III" of the Weekly Circular to ensure that the information published in this document is accurate and credible;
- IÉ (Infrastructure Manager) should review the current process for late changes to possessions to ensure changes to possession arrangements are verified by a suitable member of staff and formally communicated to all relevant personnel;
- IÉ (Infrastructure Manager) should undertake a review of possession incidents that have occurred over the last four years to ensure that reports are completed and recommendations are identified and addressed.

5.3 Operating irregularity during Single Line Working between Dundalk and Newry

On the 22nd March 2013, weather conditions between Dundalk and Newry were such that there was a heavy downfall of snow and localised flooding in the area, causing landslips. This resulted in degraded conditions on the railway line running cross-border between the Republic of Ireland and Northern Ireland. Single Line Working (SLW) with a Pilotman was introduced over the *Down line,* between Dundalk and Newry*,* to keep the rail services operational.

On the morning of the 23rd March, the Down Line remained clear for rail traffic and SLW was reintroduced between Newry and Dundalk. The first service of the morning was the 06:50 hrs Belfast to Dublin which departed Newry at 07:51 hrs Pilotman, from Northern Ireland Railways (NIR), on board. Although certified as a competent Pilotman, the Pilotman had never performed the role prior to this date.

On arrival at Dundalk, the passengers disembarked from the train and the Pilotman contacted the Signalman from Iarnród Éireann (IÉ), to tell him he was returning with the same train; which was travelling to Belfast and he was going to disembark at Newry. The Pilotman told the IÉ Signalman to signal the next train, the 07:35 hrs Dublin to Belfast service (Train A122), through Dundalk into the SLW. The Pilotman did not have the authority to give this instruction, as the IÉ Signalman is the person who gives permission for train movements.

However, the IÉ Signalman followed the Pilotman's instructions, allowing the 07:35 hrs Dublin to Belfast service to enter the SLW section behind the empty train returning to Belfast with no Pilotman present, which is in contravention of Section N of the IÉ Rule Book. The train was stopped by an NIR Signalman approximately 800 metres (m) from Newry Station as it was an unauthorised movement.

The immediate cause of Train A122 entering a SLW section between Dundalk and Newry without a Pilotman was as a result of the train being signalled for the route. The causal factors associated with the incident are:

- The IÉ Signalman did not follow the procedures set out in the Rule Book, by setting the route for Train A122 to allow Train A122 proceed into a SLW section without a Pilotman, after the Pilotman requested for the train to proceed into the section;
- The Pilotman did not follow procedures set out in the Rule Book in that he requested that the IÉ Signalman send on Train A122 without a Pilotman;
- The IÉ Signalman did not inform the driver of Train A122 of the SLW established on the route he was travelling.

Contributory factors associated with the incident are:

- The IÉ Signalman was inexperienced in SLW resulting in him not questioning the instructions given by the Pilotman and not using the procedure of blocking the entrance to the SLW section;
- The Pilotman was inexperienced in the practical aspect of SLW, and was under pressure to resolve an unforeseen situation, resulting in him requesting a train to be allowed travel into a SLW behind the train he was travelling on board;
- The Pilotman who was implementing the SLW did not have adequate local knowledge of routes or layout of stations used by cross-border services;
- The signalling equipment and infrastructure to facilitate bi-directional signalling cross-border has not been commissioned, resulting in the requirement to use the SLW process;
- The communications between the Signalmen and the Pilotman were affected by the use of a mobile phone, in that, the mobile phone had poor signal strength and was roaming in border area and the lack of awareness of the regional prefixes resulted in all parties being unable to connect with each other at the required times.

Underlying factors associated with the incident were:

- The training and competence for SLW in both NIR and IÉ is theoretical classroom-based which has led to a lack of practical understanding when confronted with the SLW procedures, in particular where a change in the planned running of trains has occurred.

Three new safety recommendations were made as a result of this incident:

- IÉ/NIR should review the signalling infrastructure cross-border with a view to commissioning the bi-directional signalling;
- IÉ/NIR should each review their training, assessment and competency management of signalmen and pilotman in relation to SLW with Pilotmen to ensure they are confident in performing their respective duties during SLW and are familiar with the routes covered;
- IÉ/NIR should each review current communication procedures with regard to the updated communication equipment now available.

5.4 DART Wrongside Door Failure, Salthill & Monkstown Station

On the 10th August 2013 at 08:50 hours the driver of the DART service from Howth to Greystones was stopped at Salthill & Monlstown Station, when he noticed that the blue Door Interlock Light, a light used by drivers for confirmation that the passenger doors are closed, was illuminated while the rear passenger doors of the train were open. After a number of checks, the driver found that the coupler was damaged and the rear units of the train were incorrectly coupled (see Figure 7). He contacted the Chief Mechanical Engineers Department (CME) and the train was taken out of service and sent to Fairview Depot for inspection.

Figure 7 – Damaged autocoupler

This design weakness was first recorded on the 26th August 2010; in February 2012 after reports of two similar incident, an investigation was carried out by the CME which resulted in a number of recommendations, including a recommendation in relation to a design modification to rectify the design weakness and an interim mitigation measure of a 'Coupler Electrical Head Integrity Test' to be carried out by drivers after coupling to ensure correct coupling. These recommendations were not fully implemented at the time of the incident.

The immediate cause of the blue Door Interlock Light illuminating while the passenger doors were open, causing a wrongside failure, was as a result of the autocouplers on carriages 8102 and 8314 being incorrectly coupled, which resulted in the Door Closed Circuit not passing through the incorrectly coupled carriages, resulting in the driver's display indicating that all doors were closed.

Contributory Factors (CFs) associated with the incident are as follows:

- One of the electrical head doors of carriage 8102 was damaged at some time previous to the coupling on the day of the incident, which stopped the electrical coupler head from moving in either direction, preventing correct coupling;
- A design weakness in the autocoupler, known to the CME prior to the incident, allowed the blue Door Interlock Light to illuminate when passenger doors remained open;
- A train driver did not carry out the full train preparations and therefore did not notice the damage to the electrical coupler head.

Underlying causes (UCs) associated with the incident are as follows:

- The CME did not correspond with DART Operations to consider the introduction of a Coupler Electrical Head Integrity Test for EMU trains after coupling, to mitigate the risk associated with the known design weakness;
- The Drivers' Manual put an unrealistic reliance on drivers to identify coupling faults, given that minor flaws can result in the autocouplers being incorrectly coupled;
- The design modification process, being undertaken by the CME at the time of the incident, did not require for sufficient risk mitigation measures to be introduced (such as the Electrical Coupler Head Integrity Test) to mitigate the identified risk of re-occurrence until the design modification was complete.

Root causes (RCs) associated with the incident are as follows:

- The CME did not fully adhere to their relevant SMS documents (CME-SMS-001 & RU-SMS-007) as they did not adequately address the recommendations from their own internal investigation report in relation to the design weakness of the autocoupler.

As a result of this investigation, the RAIU have made four safety recommendations:

- The CME (IÉ RU) should review and modify their design for the EMU autocouplers to ensure a more robust coupler circuit that will provide assurance that both coupler electrical heads have connected correctly and that coupler circuits are continuous throughout the train consist. Any modification made should be documented in Rolling Stock Design Standards.
- The CME (IÉ RU) should introduce a visual indicator on the driving console to indicate to the driver that coupling has been completed successfully (or a visual or audible indication that coupling has failed);
- DART Operations (IÉ RU) should update the Drivers' Manual to include specific guidance on the requirement for the examination of couplers. The update should also include guidance on associated testing of coupler integrity and guidance on any indications in the driving cab that would assist the driver in detecting any coupler failure;
- The CME (IÉ RU) should review and modify the processes set out in their SMS for closing recommendations to ensure recommendations from investigations are recorded, monitored and closed. When these processes have been established, they should be audited (by a party external to the CME) at predefined intervals to ensure compliance.

5.5 Tram fire on approach to Busáras Luas Stop

On the 7th November at 16:30 hours, a flash fire occurred on Luas Tram 3002 as it approached Busaras stop in Dublin City. The tram was operating a Red Line Service. Travelling from The Point to Tallaght (see Figure 8). There were no injuries as result of the fire and the damage to the tram was minor.

Figure 8 – Fire on LUAS

The immediate cause of the fire on Tram 3002 was the combination of an arc in traction Cable 1 and a rupture in hydraulic Hose 1 atomising and igniting the fluid producing a flash fire. Contributory Factors associated with the accident are as follows:

- The interaction between Hose 1 and Cable 1 led to both components sustaining damage that ultimately initiated the fire;
- The cable involved in the accident did not contain the protective braid which was present in the original 401 fleet which may have provided additional protection to the conductor;
- A number of the free lengths on the traction cables were measured to be longer than the length detailed in the original design which may have allowed a greater degree of movement in the cables during operation;
- The electrical protection built into the traction system did not isolate the arcing fault, which may have led to the arc being sustained for a longer period of time.

Underlying causes associated with the accident are as follows:

- The requirement to maintain Hose 1 at a 15° offset from the vertical was not prescribed in relevant maintenance instructions;
- The 401 fleet hazard log did not identify the undesirable event of the interaction between the braking hoses and traction cables and the resultant potential events, for example a flash fire;
- Maintenance defect management processes in Alstom had not identified the potential consequences of fretting between the braking hoses and traction cables and there were also no procedures directly related to the repair of traction cables;
- The investigation undertaken in 2008, into the failure of the hydraulic brake circuit, and resulting actions was insufficient to avoid reoccurrence

The following Additional Observation, not relating to the cause of the accident, were made during the investigation:

- An independent fire report into the accident identified that the flash point of the hydraulic fluid used was relatively low compared to other hydraulic fluids referenced in an ignition handbook.

The RAIU has made six new safety recommendations related to the occurrence, these are:

- Transdev should ensure that Alstom, as the contracted VMC, review maintenance instructions to ensure separation is maintained between hydraulic circuit and the traction cables at installation and during operation;
- Transdev should ensure that Alstom, as the contracted VMC, add the interaction between the braking hoses and traction cables and the potential event of a flash fire to the hazard log of the 401 Type Tram and implement all identified mitigation actions;
- Transdev should ensure that Alstom, as the contracted VMC, review the requirements for traction cables in the MIC bogie and produce and implement a suitable specification for this component. Installation procedures should also be reviewed to ensure that the free length requirements of these components are fulfilled;
- Transdev should ensure that Alstom, as the contracted VMC, review the performance requirements for the isolation protection system in the MIC bogie to ensure that it meets the requirements of the 401 hazard log or revise the 401 hazard log accordingly;
- Transdev should ensure that Alstom, as the contracted VMC, review the defect priority matrix with regards to damage to traction cable insulation and fretting between these components and hydraulic hoses. In addition to this, maintenance procedures should be introduced to specify actions for the repair of traction cables;
- Transdev should ensure that Alstom, as the contracted VMC, review their incident / accident investigation process to ensure that investigations are of sufficient depth and produce clear recommendations.

One other recommendation was made due to an AO, this is:

- Transdev should undertake a review of higher ignition temperature hydraulic oils to identify if they would be feasible in the braking circuit and add a safety benefit.

5.6 Structural Failure of a platform canopy at Kent Station, Cork

On the 18th December at 15:01 hrs, the canopy over Platforms 1 and 2 at Kent Station, Cork was exposed to unusably high winds and collapsed. The canopy consisted of mainly timber cantilevered roof supported by seventeen cast-iron columns which were braced longitudinally by lattice girders. The design of each column included a decorative feature at the base of the column at which fourteen of the seventeen columns fractured. This feature acted as a stress raiser and therefore an inherent weak point in the design, see Figure 9.

Figure 9 – Canopy collapse

A structural dynamics and wind loading study was undertaken by Fluvio R&D Limited (Fluvio) to determine the collapse mechanism. This work concluded that the structure initially failed at the end furthest away from the station and then the columns fractured sequentially towards the station. This model was supported by witness statements and CCTV footage. The work also calculated that a peak wind speed of between 39 metres per second (m/s) and 50 m/s would be required to initiate the collapse and concluded that speeds of this magnitude would be associated with a rare event.

The immediate cause of the accident was a significant increase in wind speed leading to greater pressure acting on the canopy over Platforms 1 and 2 resulting in the rapid failure of the cast-iron columns.

Contributory Factors associated with the accident are as follows:

- The use of cast-iron and the decorative details in the column meant that the design of the structure contained inherent weaknesses;
- Weather conditions in the vicinity of Kent Station included unusually high winds.

Underlying Causes associated with the accident are as follows:

- IÉ CCE did not have a weather management protocol in place which included actions to be taken to protect structures at risk from adverse weather conditions.

The following Additional Observation, not relating to the cause of the accident, was made during the investigation:

- The canopy had not received an inspection that met the structural requirements of IÉ standards I-FBD-8100, CCE-SMS-001 or the superseded standard I-STR-6510. In addition to this a number of the Annual Inspections undertaken did not contain the required signatures.

As a result of this investigation, the RAIU have made three safety recommendations:

- IÉ IM should identify all cast-iron structures on the network. From this, a risk-based approach should be taken in relation to the inspection of these assets, during routine inspections, in terms of any risks associated with cast-iron;
- IÉ IM should establish a formalised procedure for managing the risk associated with the adverse effects of high winds;
- IÉ IM should review the structural and annual inspection regimes for Building and Facilities (B&F) to ensure all assets are inspected in accordance with the prescribed standards and any associated documentation is completed appropriately.

5.7 Rock fall at Plunkett Station, Waterford

On the 31st December at 18:45 hours, the Signalman at Waterford Central Cabin (Signal Cabin) heard a loud rumble form outside. When the Signalman went out onto the steps of the Signal cabin to investigate, he saw a large portion of the *rock face* running adjacent to the station had collapsed onto the two tracks which run under the Signal cabin and through Plunkett Station (Waterford), see Figure 10.

Figure 10 – Rockfall at Waterford Station

Consultant geologists were engaged to inspect the rock face after the incident concluded that the immediate cause of the rock fall at Plunkett Station was likely due to the toppling of the upper part of the rock mass to the north of the structure, followed by rotation of the toppled rock mass, resulting in rock fall debris flowing onto the ground. Possible contributory factors include the actual formation of the rock (steeply inclined structure with pervasive joints and faults). The final trigger was likely due to the intense rainfall of the preceding weeks.

The RAIU investigation, and the consultant geologist's report, determined that it is unlikely that the potential for rock fall could have been identified during routine IÉ inspections. It is also unlikely that a member of IÉ staff would have been able to identify that the structure would fail, or that there would have been any warning to the imminent failure prior to the day of the incident.

Therefore no other immediate causes, contributory factors, underlying causes or root causes were identified as a result of this incident. However, the RAIU made a number of additional observations during the investigation, which include:

- The condition rating scoring tool, set out in CCE-STR-STD-2100 and CCE-STR-GDN- 2802, does not appear to be an effective system for Structures Inspectors in illustrating the condition of the asset or applying inspection frequencies;
- Inspection cards appear to be consistently failing to meet the requirements of CCE-STRSTD-2100, in that Structures Inspectors are editing the approved template, using incorrect terms and incorrectly labelling the inspection cards; and the Senior Track & Structure Engineer (STSE) is not approving the documents;

- CCE-STR-GDN-2802 includes guidance on maintenance requirements which are not mandatory and therefore not applied;
- The compliance verification process, as set out in CCE-SMS-001 and CCE-SMS-008 was ineffective at identifying the long-standing issues associated with the correct use of the Inspection Card;
- The Structures Inspectors competence did not meet the requirements set out in CCESTR-STD-2100 as he had not completed the required refresher training within the required timescale.

6 Safety recommendations

6.1 Monitoring of RAIU safety recommendations

Under the Railway Safety Act 2005, the RSC is responsible for monitoring the implementation of RAIU recommendations. All safety recommendations issued by RAIU are addressed to the RSC unless otherwise stated and the implementers are identified in the recommendation. The recommendations issued by the RAIU are reviewed by RSC for acceptability and where RSC accept the recommendations it monitors their implementation. Figure 11 identifies the three status codes assigned to recommendations by RSC and the definition of each.

Status	Description
Open	Feedback from implementer is awaited or actions have not yet been completed.
Complete	Implementer has taken measures to effect the recommendation and the RSC is considering whether to close the recommendation.
Closed	Implementer has taken measures to effect the recommendation and the RSC has considered these and has closed the recommendation.

Figure 11 – Recommendation status descriptions

Open recommendations are those for which RSC has received some or no update from the organisation or organisations responsible for implementing the recommendation and for which further action is deemed to be required by RSC. This status is assigned by RSC.

Complete recommendations are those where the organisation responsible for implementing the recommendation is satisfied that it has carried out the necessary actions to address the recommendation and for which RSC has received evidence of implementation that it will review to determine whether or not the recommendation is closed. This status is advised to RSC by the organisation or organisations responsible for implementing the recommendation.

Closed recommendations are those for which RSC is satisfied that the organisation responsible for implementing the recommendation has taken suitable action to address the recommendation. This status is assigned by RSC.

6.2 Summary of status of recommendations

The RSC as the NSA for Ireland holds meetings with the relevant stakeholders to monitor the progress of recommendations. An update is included in Appendix A on the status of individual recommendations that were not closed prior to 2014 and the recommendations are listed in chronological order by investigation report. Investigation reports where all recommendations have been closed prior to 2014 can be found in Appendix B. For clarity and completeness a comment has been included on the status of individual recommendations.

As of the 31st December 2014, the RAIU have made 27 recommendations. In addition to these the RAIU have included the 14 recommendations made by RSC in its investigation report published in 2006 on the collapse of the Cahir viaduct in 2003. All recommendations were accepted by their addressee and implementer. The status of the recommendations as of the end of 2014 is included in Figure 12.

Year	Total	Open	Complete	Closed
2006*	14	0	1	13
2007	0	0	0	0
2008	7	0	2	5
2009	13	0	1	12
2010	26	5	4	17
2011	17	4	8	5
2012	13	3	4	6
2013	10	4	6	0
2014	27	15	7	5
Totals	**127**	**31**	**33**	**63**
Total Recommendations made to date				

*Recommendations issued by the RSC

Figure 12 – Status of recommendations by year

6.3 Progress in 2014

The overall progress with the closure of recommendations, in 2014, is shown in Figure 14. Fifty percent recommendations issued have been closed; approximately a quarter are complete; and the final quarter remains open.

In comparison with 2013 (see Figure 13), the overall performance in terms of closing recommendations improved for 2014:

- The number of closed recommendations increased from 47% to 50%;
- The number of open recommendations decreased from 28% to 24%;
- The number of complete recommendations increased in 2014, from 25 to 26%.

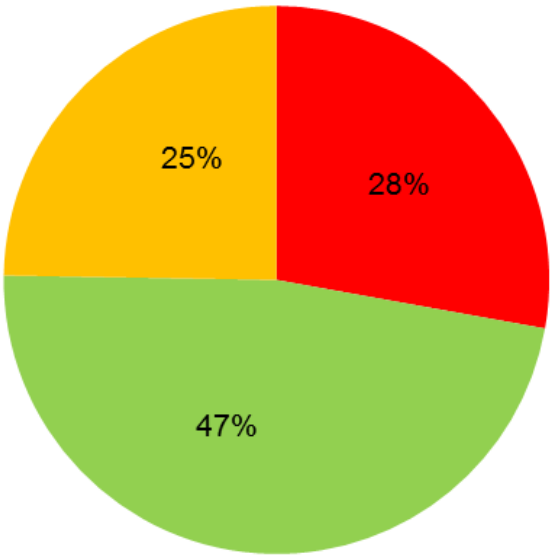

Figure 13 – Status of recommendations in 2013

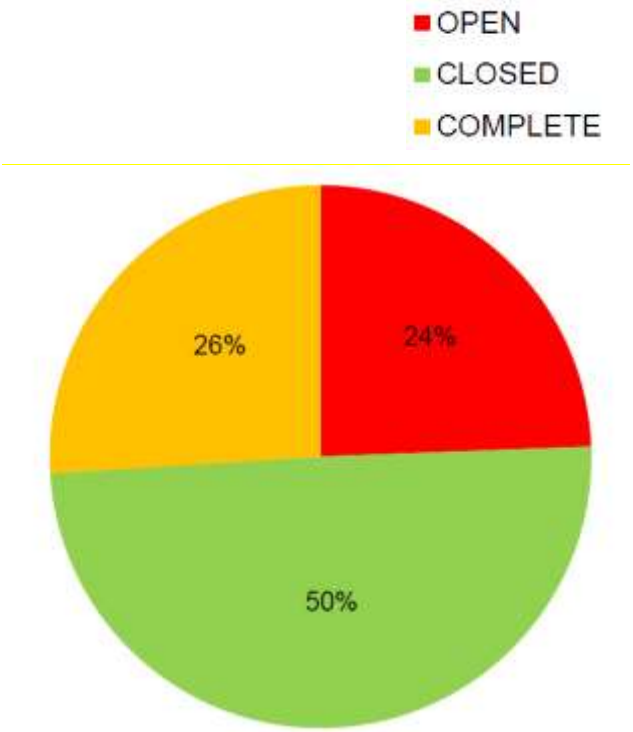

Figure 14 – Status of recommendations in 2014

Appendix A – Status of individual recommendations in 2014 (Open/ Complete/ Closed)

Status of individual recommendations by report – 2006

Investigation report no.	None	**Issued**	July 2006
Inquiry into the Derailment of a Freight Train at Cahir Viaduct on 7th October 2003			
Recommendations:			
Total no.	14	**Closed as of end of 2013**	10
Status of outstanding recommendations in 2014:			
2006-001	IÉ should conduct a review of its safety management system to identify all areas where design, inspection and maintenance procedures are not fully developed and documented, and should establish a programme to develop and implement the necessary specifications and standards prioritised on the basis of safety risk. The content and structure of each specification or standard should reflect the safety criticality of the various elements of the associated procedure or physical asset.		
	Comment	In circa 2010 IÉ introduced formalised SMSs supported by Quality and Technical suites. IÉ-IM and specifically the CCE department have developed a comprehensive library of technical standards covering all key structures and processes. Inspections are mandated, undertaken and recorded. The RSC has audited a number of these processes and have found IÉ to be largely compliant. This recommendation was closed in December 2014.	Status: Closed
2006-003	IÉ should review the derailment containment arrangements on its various structures and make whatever modifications might be required to ensure that they are fit for purpose and capable of preventing disproportionate failure.		
	Comment	IÉ-IM submitted documentation and advised they are of the opinion the safety recommendation is complete. The RSC closed this recommendation in May 2014.	Status: Closed
2006-009	IÉ should ensure that, pending full implementation and validation of new data management systems including those currently in course of development, comprehensive and up to date records of infrastructure asset inspection and maintenance are maintained and that relevant data is effectively promulgated to inspectors, maintainers and managers.		
	Comment	IAMS and SAP are the tools used by IÉ-IM and IÉ-RU to manage their assets and appear robust. The RSC have undertaken a number of process audits across IÉ RU & IM and have found that work orders are raised for cyclical and work arising tasks.; and issues related to 'compliance verification' have now been	Status: Closed

		addressed. The RSC is satisfied that asset management is now taking place routinely across all departments and closed the recommendation in December 2014.	
2006-015	IÉ should review its existing communications systems and take whatever action is necessary to ensure that on all parts of system train drivers are provided with an effective means of communication with the controlling signalman.		
	Comment	No change of status in 2014. Note: Recommendation 2006-014 does not exist.	Status Complete

Status of individual recommendations by report – 2008

Investigation report no.	07062801	**Issued**	18th June 2008
Report into the Collision at Level Crossing XN104 between Ballybrophy and Killonan, 28th of June, 2007			
Recommendations:			
Total no.	7	**Closed as of end of 2013**	4
Status of outstanding recommendations in 2014:			
2008-001	IÉ to review the various sources of information relevant to level crossings and develop a standard, or suite of standards, consolidating information on: civil engineering specifications; signage specifications; visibility of approaching trains; and inspection and maintenance. Ensuring effective implementation and compliance		
	Comment	No change of status in 2014.	Status: Complete
2008-003	IÉ to develop and implement a vegetation management programme that addresses vegetation management on a risk basis, prioritising high risk areas.		
	Comment	No change of status in 2014.	Status: Complete
2008-004	IÉ to ensure that a system is put in place for effective implementation of existing standards and to manage the timely introduction of new and revised standards, this should include departmental instructions.		
	Comment	IÉ-IM Safety forwarded a Document Control Standard for both CCE and SET departments. They advised there are no QMSs in the two new IM departments (New Works & IM Operations) but content these are outside the scope of the safety recommendation. IÉ-IM Safety contend that the safety recommendation is complete; and the RSC closed this recommendation in September 2014.	Status: Closed

Status of individual recommendations by report – 2009

Investigation report no. 08022801		**Issued** 2nd March 2009	
Report into the Fatality at Level Crossing XX032 between Ballina and Manulla Junction, 28th February 2008			
Recommendations:			
Total No. 4		**Closed as of end of 2013** 3	
Status of outstanding recommendations in 2014:			
2009-003	IÉ must identify crossings that are regularly misused and take proactive action to manage the increased risk created by this misuse.		
	Comment	In 2014 the RSC was advised of two LC awareness events undertaken at two habitually misused LCs, XM240 Killinger and XG159 Sullivans. IÉ, the RSA, local authority and Gardai attended these events. This recommendation remains complete.	Status: Complete

Status of individual recommendations by report - 2010

Investigation report no.	R2010-003	**Issued**	10th June 2010
Derailment of an on track machine at Limerick Junction Station on the Dublin to Cork Line, 3rd of July 2009			
Time & Date	04:50, 3rd July 2009	**Location**	Limerick Junction Station
Railway	IÉ	**Line**	Dublin to Cork line
Recommendations:			
Total no.	2	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			

2010-003	IÉ should put in place a formalised process to ensure that life expired points are removed from service, where this is not possible a risk assessment should be carried out and appropriate controls should be implemented to manage the risks identified.		
	Comment	No change of status in 2014.	Status: Complete

Investigation report no.	2010-R004	**Issued**	16th August 2010
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009			
Time & Date	18:20, 21st August 2009	**Location**	Malahide viaduct
Railway	IÉ	**Line**	Dublin to Belfast line
Recommendations:			
Total no.	15	**Closed as of end of 2013:**	10
Status of outstanding recommendations in 2014:			

2010-013	IÉ should adopt a formal process for conducting structural inspections in the case of a report of a structural defect from a member of the public.		
	Comment	As part of the bridge audit the following evidence was supplied; CCE-QMS-005-018 'Response procedure within CCE to potential safety incidents reported by 3rd Parties'. Further detail on the recording of the inspection is needed to meet this recommendation. There is no change in status for this recommendation.	Status: Complete
2010-015	IÉ should review their network for historic maintenance regimes and record this information in their information asset management system. For any future maintenance regimes introduced on the network, IÉ should also record this information in their information asset management system.		
	Comment	No change of status in 2014. The project to implement this recommendation is in progress.	Status: Open

2010-017	IÉ should carry out an audit of their filed and archived documents, in relation to structural assets, and input this information into their information asset management system.		
	Comment	No change of status in 2014. Archiving of bridge data is taking place.	Status: Open
2010-018	The RSC should review their process for the closing of recommendations made to IÉ by independent bodies, ensuring that they have the required evidence to close these recommendations. Based on this process the RSC should also confirm that all previously closed recommendations satisfy this new process.		
	Comment	No change of status in 2014. RSC has reviewed and updated its procedures for the management of safety recommendations; these were published in the first quarter of 2012. A review of the safety recommendations issued by AD little and IRMS is taking place.	Status: Open
2010-019	The RSC, in conjunction with IÉ, should develop an action plan in order to close all outstanding recommendations in the AD Little Review (2006) and the International Risk Management Services Reviews (1998, 2000, 2001). This action plan should include defined timescales for the implementation and closure of all these recommendations.		
	Comment	No change of status in 2014. A review of the safety recommendations issued by AD little and IRMS is taking place.	Status: Open

Investigation report no.	2010-R005	**Issued**	24th August 2010
Irregular operation of Automatic Half Barriers at Fern's Lock, County Kildare, on the Dublin to Sligo Line, 2nd September 2009			
Occurrence date	2nd September 2009	**Location**	Level crossing XG019
Railway	IÉ	**Line**	Dublin to Sligo line
Recommendations:			
Total No.	1	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2010-020	IÉ should review the competencies of all signalmen to ensure that when signalmen are assigned relief duties they have the required training and experience to perform these duties appropriately.		
	Comment	The RSC receive notification from IÉ-IM on 5th November 2014 that they are of the opinion this recommendation is complete. The RSC closed this recommendation in December 2014.	Status: Closed

Investigation report no.	2010-R006	**Issued**	15th November 2010
Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th November 2009			
Occurrence date	16th November 2009	**Location**	28 ½ milepost
Railway	IÉ	**Line**	Dublin to Rosslare Europort
Recommendations:			
Total No.	6	**Closed as of end of 2013:**	3
Status of outstanding recommendations in 2014:			

2010-024	IÉ should review their structures list and ensure that all earthworks are identified and included on this list. Upon updating this list, a programme for the inspection of earthworks is to be developed and adopted at the frequency requirements set out by the Structural Inspections Standard, I-STR-6510.		
	Comment	No change of status in 2014. The project to implement this recommendation is in progress.	Status: Open
2010-025	IÉ and the RSC should review their process for the issuing of guidance documents, to ensure that the third parties affected by these guidance documents are made aware of their existence.		
	Comment	No change of status in 2014.	Status: Complete
2010-026	IÉ should review the effectiveness of their Structural Inspections Standard, I-STR-6510, with consideration for the possibility of more thorough inspections being carried out on cuttings to establish the topography and geotechnical properties of cuttings; and from this information identify any cuttings that are vulnerable to failure.		
	Comment	No change of status in 2014.	Status: Complete

Status of individual recommendations by report - 2011

Investigation report no.	2011-R001	**Issued**	19th January 2011
Laois Traincare Depot Derailment, 20th January 2010			
Occurrence date	20th January 2010	**Location**	Laois Traincare Depot
Railway	IÉ	**Line**	Dublin to Cork line
Recommendations:			
Total no.	2	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			

2011-002	IÉ should ensure that the Signal Sighting Committee is informed when train drivers report difficulties viewing a signal and the Signal Sighting Committee should verify that the reported difficulties are addressed effectively.		
	Comment	No change of status in 2014.	Status: Complete

Investigation report no.	2011-R002	**Issued**	5th May 2011
Secondary suspension failure on a train at Connolly Station, 7th May 2010			
Occurrence date	7th May 2010	**Location**	Connolly Station
Railway	IÉ	**Line**	Dublin to Sligo line
Recommendations:			
Total No.	3	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2011-003	IÉ should ensure all work in rolling stock maintenance depots is carried out in accordance with its control process.		
	Comment	No change of status in 2014.	Status: Complete
2011-004	IÉ should review its process of managing the hazard log in relation to the Class 29000s to ensure the adequacy of this process and verify that implementation of closure arguments in the hazard log is effective.		
	Comment	No change of status in 2014.	Status: Open
2011-005	IÉ should evaluate the risks relating to failure of the centre pivot pin to perform its function due to over-inflation of the secondary suspension and determine if any design modifications are required to avoid future failures.		
	Comment	Status upgraded from open to complete in 2014..	Status: Complete

Investigation report no.	2011-R003	**Issued**	11th May 2011
Tram derailment at The Point stop, Luas Red Line, 13th May 2010			
Occurrence date	11th May 2010	**Location**	The Point stop
Railway	IÉ	**Line**	Luas Red line
Recommendations:			
Total No.	1	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2011-006	Veolia should introduce a communication protocol between normal and emergency for given situations where a clear understanding between a tram driver and Central Control Room are required.		
	Comment	No change of status in 2014.	Status: Complete

Investigation report no.	2011-R004	**Issued**	27th June 2011
Gate Strike at Buttevant Level Crossing (XC 219), County Cork, on the 2nd July 2010			
Occurrence date	2nd July 2010	**Location**	Level crossing XC219
Railway	IÉ	**Line**	Dublin to Cork line
Recommendations:			
Total No.	2	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			

2011-007	IÉ should identify similar manned level crossings where human error could result in the level crossing gates being opened to road traffic when a train is approaching; where such level crossings exist, IÉ should implement engineered safeguards; where appropriate.		
	Comment	No change of status in 2014.	Status: Open

Investigation report no.	2011-R005	**Issued**	18th July 2011
Person struck at level crossing XE039, County Clare, 27th June 2010			
Occurrence date	27th June 2010	**Location**	Level crossing XE039
Railway	IÉ	**Line**	Limerick to Claremorris line
Recommendations:			
Total No.	3	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2011-009	IÉ should ensure that risk assessments are produced for all user worked level crossings to identify all hazards specific to particular level crossings.		
	Comment	No change of status in 2014.	Status: Complete
2011-010	IÉ should review their documentation on the measurement of viewing distances at existing user worked level crossings to ensure that the viewing distances provide sufficient views of approaching trains to allow level crossing users cross safely.		
	Comment	No change of status in 2014.	Status: Complete
2011-011	IÉ should review their procedures for the management of accidents to ensure that communication with the emergency services is clear and provides the necessary information to locate an accident site without undue delay and access it by the most appropriate point.		
	Comment	No change of status in 2014.	Status: Complete
Note	Recommendation 2008-003 from investigation report 07062801 was reiterated.		

Investigation report no.	2011-R006	**Issued**	4th October 2011
Road vehicle struck at level crossing XM096, County Roscommon, 2nd September 2010			
Occurrence date	2nd September 2010	**Location**	Level crossing XM096
Railway	IÉ	**Line**	Athlone to Westport line
Recommendations:			
Total no.	5	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2011-012	IÉ should put in place a formal process for identifying and communicating with known users of user worked level crossings.		
	Comment	On the 18th December 2014 IÉ-IM advised by way of email and supporting evidence that they are of the opinion action has been taken to affect this safety recommendation. The RSC closed this recommendation in December 2014	Status: Closed

2011-013	IÉ should review the effectiveness of its signage at user worked level crossings, and amend it where appropriate, taking into account the information provided in the level crossing user booklet. The review should include the information on the use of railway signals, what to do in case of difficulty when crossing the railway and ensuring the signage is illustrated in a clear and concise manner, taking into account current best practice and statutory requirements.		
	Comment	No change of status in 2014.	Status Open
2011-014	IÉ should update its risk management system to ensure that interim control measures are put in place where longer term controls to address risks require time to implement.		
	Comment	IÉ-IM content this safety recommendation is complete. The RSC received evidence of SRG review of STSE Risk Registers to review risk control measures (mitigations in place). The RSC closed this recommendation in October 2014.	Status Closed
2011-015	IÉ should review how it determines the safe crossing time for user worked level crossings to ensure the safe crossing time allows adequate time for movements and includes a safety margin, over and above the crossing time.		
	Comment	Status upgraded from open to complete in 2014.	Status Complete
2011-016	IÉ should review its use of disused rail as fencing at user worked level crossings to ensure it cannot potentially increase the severity of a collision and where this is the case, replace the disused rail with appropriate fencing.		
	Comment	IÉ-IM submitted a report reviewing the use of disused rail in fencing and are now of the opinion that this recommendation is complete. The RSC closed this recommendation in October 2014.	Status Closed
Note	Recommendation 2008-003 from investigation report 07062801 was reiterated.		

Investigation report no.	2011-R007	**Issued**	19th October 2010
Car Strike at Knockaphunta Level Crossing (XM250), County Mayo, 24th October 2010			
Occurrence date	24th October 2010	**Location**	Level crossing XM250
Railway	IÉ	**Line**	Athlone to Westport line
Recommendations:			
Total no.	1	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2011-017	IÉ should upgrade the Level Crossing to ensure that the operation of the Level Crossing is not reliant on any direct action by the level crossing user.		
	Comment	Status upgraded from open to complete closed in 2014.	Status: Complete
Note	Recommendation 2009-003 from investigation report 08022801 and recommendation 2009-009 from investigation report 08073101 were reiterated.		

Status of individual recommendations by report – 2012

Investigation report no.	2012-R001	**Issued**	08th February 2012
Car Strike at Murrough Level Crossing XG 173, 14th February 2011			
Occurrence date	14th February 2011	**Location**	Level Crossing XG 173 (Morrough)
Railway	IÉ	**Line**	Dublin to Galway
Recommendations:			
Total no.	4	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			

2012-001	IÉ should review the suitability of the signage at user worked crossings on public and private roads, ensuring that human factors issues are identified and addressed.		
	Comment	No change of status in 2014.	Status: Open
2012-002	IÉ should liaise with local authorities where private road level crossings can be accessed from a public road to ensure there is advance warning to road users		
	Comment	No change of status in 2014.	Status: Open
2012-003	IÉ should ensure that they adopt their own standards in relation to design changes to any PEIO that has the potential to affect safety.		
	Comment	No change of status in 2014.	Status: Complete

Investigation report no.	2012-R002	**Issued**	19th September 2012
Runaway locomotive at Portlaoise Loop, 29th November 2012			
Occurrence date	29th November 2011	**Location**	Portlaoise Loop
Railway	IÉ	**Line**	Dublin to Cork
Recommendations:			
Total no.	4	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2012-005	IÉ should review their VMIs for locomotives to ensure that there are adequate braking tests at appropriate intervals.		
	Comment	No change of status in 2014.	Status: Complete
2012-006	IÉ should adopt a quality control system, for the introduction of new maintenance procedures for locomotives.		
	Comment	The RSC closed this recommendation in April 2014.	Status: Closed

2012-007	IÉ should review their system for introducing new train drivers' manuals, to ensure that train drivers are fully trained and assessed in all aspects of these manuals.		
	Comment	No change of status in 2014.	Status: Open
2012-008	IÉ should review their competency management system for train drivers to ensure that all driving tasks are routinely assessed.		
	Comment	CCE submitted documents and advise that they believe recommendation is complete.	Status: Complete

Investigation report no.	2012-R003	**Issued**	26th September 2012
Bearing failure on a train at Connolly Station, 18th October 2012			
Occurrence date	18th October 2011	**Location**	Connolly Station
Railway	IÉ	**Line**	Dublin to Belfast
Recommendations:			
Total no.	5	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			
2012-010	IÉ should ensure the competency management system for signalmen includes the assessment of HABD related functions they perform.		
	Comment	The RSC closed this recommendation in April 2014	Status: Closed
2012-011	IÉ should put in place formal procedures governing the role of FTS staff in relation to HABDs.		
	Comment	Status upgraded from open to complete in 2014.	Status: Complete
2012-012	IÉ should ensure that a robust system is put in place for the competency assessment of safety critical rolling stock maintenance staff.		
	Comment	The RSC closed this recommendation in April 2014	Status: Closed
2012-013	IÉ should update its competency management system for train drivers to include assessment of their competency in relation to their tasks following a HABD alarm.		
	Comment	The RSC closed this recommendation in April 2014.	Status: Closed

Status of individual recommendations by report – 2013

Investigation report no.	2013-R002	**Issued**	17th June 2013
Tractor struck train at level crossing XE020, 20th June 2012			
Occurrence date	14th February 2011	**Location**	Level Crossing XE 020
Railway	IÉ	**Line**	Dublin to Galway
Recommendations:			
Total no.	4	**Closed as of end of 2013:**	0
Status of outstanding recommendations in 2014:			

2013-001	IÉ should close, move or alter the level crossing in order to meet the required viewing distances in IÉ's technical standard CCE-TMS-380 Technical Standard for the Management of User Worked Level Crossings.		
	Comment	This recommendation has been marked as complete in 2014.	Status: Complete
2013-002	IÉ should review their systems of managing level crossings that fail to meet the viewing distances in IÉ technical standard CCE-TMS 380 Technical Standard for the Management of User Worked Level Crossings to ensure that any mitigation measure that is introduced is effective at reducing the risk to level crossing users.		
	Comment	No change in status of this recommendation in 2014.	Status: Open
2013-003	IÉ should audit their LCRM system, to ensure it correctly identifies high risk level crossings; and identifies appropriate risk mitigation measures for individual level crossings.		
	Comment	This recommendation has been marked as complete in 2014.	Status: Complete
2013-004	IÉ staff who may be required to contact the emergency services should have the appropriate information readily available to them in order to give clear instructions to the emergency services in order that they can attend accident sites in a prompt manner. This information should then be updated in IÉ's Rule Book.		
	Comment	No change in status of this recommendation in 2014.	Status: Open
Note	Recommendation 2011-011 from investigation report 2011-R005 was reiterated.		

Investigation report no.	2013-R003	**Issued**	19th September 2013
Fog signal activation in Dart driving cab, Bray, on the 6th March 2012.			
Occurrence date	6th March 2012	**Location**	Bray train station
Railway	IÉ	**Line**	Dublin to Rosslare Europort
Recommendations:			
Total no.	4	**Closed as of end of 2013:**	1
Status of outstanding recommendations in 2014:			

2013-005	IÉ should ensure that their procurement and quality control processes verify that goods received are of the correct specification as those ordered.		
	Comment	No change in status of recommendation in 2014.	Status: Open
2013-006	IÉ should introduce appropriate procedures and standards for the safe issue, storage and transportation of fog signals.		
	Comment	This recommendation has been marked as complete in 2014.	Status: Complete
2013-007	IÉ drivers should receive adequate training in the safe handling of fog signals.		
	Comment	This recommendation has been marked as complete in 2014.	Status: Complete

Status of individual recommendations by report – 2014

Investigation report no.	R2014 – 001	**Issued**	27th January 2014
Trend Investigation: Possession incidents on the Iarnród Éireann network			
Occurrence date	Multiple	**Location**	Multiple
Railway	IÉ	**Line**	Multiple
Recommendations			**Total no.** 6

2014-001	IÉ (Infrastructure Manager) should develop a formal possession planning meeting framework that is consistent through the IÉ network.		
	Comment	The RSC receive notification and supporting evidence from IÉ-IM on 18th December 2014 that they are of the opinion this recommendation is complete. The RSC closed this recommendation in December 2014.	Status: Closed
2014-002	IÉ (Infrastructure Manager) should review the application of Back-to-Back possessions and implement actions to eliminate any informal practices that do not comply with IÉ Rule Book.		
	Comment	The RSC receive notification and supporting evidence from IÉ-IM on 18th December 2014 that they are of the opinion this recommendation is complete. The RSC closed this recommendation in December 2014.	Status: Closed
2014-003	IÉ (Infrastructure Manager) should establish a possession planning procedure that ensures protection arrangements are based on the work to be delivered and are verified by a suitable member of staff and formally communicated to all relevant personnel.		
	Comment	The CCE submitted new QMS standard and associated work instructions and advised that they are of the opinion the recommendation is complete. The RSC closed this recommendation in December 2014.	Status: Closed
2014-004	IÉ (Infrastructure Manager) should monitor and review entries into Section "Engineering works requiring absolute possessions – Section T Part III" of the Weekly Circular to ensure that the information published in this document is accurate and credible.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-005	IÉ (Infrastructure Manager) should review the current process for late changes to possessions to ensure changes to possession arrangements are verified by a suitable member of staff and formally communicated to all relevant personnel.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open

2014-006	IÉ (Infrastructure Manager) should undertake a review of possession incidents that have occurred over the last four years to ensure that reports are completed and recommendations are identified and addressed.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open

Investigation report no.	R2014 – 002	**Issued**	28th April 2014
Operating irregularity during Single Line Working between Dundalk and Newry, 23rd March 2013			
Occurrence date	23rd March 2013	**Location**	Dundalk – Newry
Railway	IÉ	**Line**	Belfast – Dublin
Recommendations			Total no. 3

2014-007	IÉ should review the signalling infrastructure cross -border with a view to commissioning the bi-directional signalling.		
	Comment	RSC receive notification and supporting evidence from IÉ-IM on 11th December 2014 that they are of the opinion this recommendation is complete. The RSC closed this recommendation in December 2014.	Status: Closed
2014-008	IÉ should review their training, assessment and competency of signalmen and pilotmen in relation to SLW with Pilotman to ensure they are confident in performing their respective duties during SLW and are familiar with the routes covered.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-009	IÉ should review current communication procedures with regard to the updated communication equipment now available.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open

Investigation report no.	R2014 – 003	**Issued**	30th July 2014
DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013			
Occurrence date	10th August 2013	**Location**	Salthill & Monkstown Station
Railway	IÉ	**Line**	Howth - Greystones
Recommendations			Total no. 4

2014-010	The CME (IÉ RU) should review and modify their design for the EMU autocouplers to ensure a more robust coupler circuit that will provide assurance that both coupler electrical heads have connected correctly and that coupler circuits are continuous throughout the train consist. Any modification made should be documented in Rolling Stock Design Standards.		
	Comment	IÉ-RU and specifically the CME advised that the EMU coupler design circuits were revised and was documented through an 'engineering change request'. Evidence submitted to demonstrate same. The RSC closed this recommendation in October 2014.	Status: Closed
2014-011	The CME (IÉ RU) should introduce a visual indicator on the driving console to indicate to the driver that coupling has been completed successfully (or a visual or audible indication that coupling has failed).		
	Comment	IÉ-RU and specifically the CME advised that the EMU coupler design circuits were revised and this included the addition of a visual indicator in the cab. Evidence submitted to demonstrate same.	Status: Complete
2014-012	DART Operations (IÉ RU) should update the EMU Drivers' Manual to include specific guidance on the requirement for the examination of couplers. The update should also include guidance on associated testing of coupler integrity and guidance on any indications in the driving cab that would assist the driver in detecting any coupler failure.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-013	The CME (IÉ RU) should review and modify the processes set out in their SMS for closing recommendations to ensure recommendations from investigations are recorded, monitored and closed. When these processes have been established, they should be audited (by a party external to the CME) at predefined intervals to ensure compliance.		
	Comment	On the 11th December 2014 IÉ-RU advised by way of email and supporting evidence that they are of the opinion action has been taken to affect this safety recommendation.	Status: Complete

Investigation report no.	R2014 – 004	**Issued**	28th August 2014
Tram fire on approach to Busáras Luas Stop on the 7th November 2013			
Occurrence date	7th November 2013	**Location**	Busáras Luas Stop
Railway	Transdev	**Line**	Red Line
Recommendations			Total no. 6

2014-014	Transdev should ensure that Alstom, as the contracted VMC, review maintenance instructions to ensure separation is maintained between hydraulic circuit and the traction cables at installation and during operation.		
	Comment	On the 5th December 2014, Transdev advised by way of letter that they are of the opinion action has been taken to complete this safety recommendation.	Status: Complete
2014-015	Transdev should ensure that Alstom, as the contracted VMC, add the interaction between the braking hoses and traction cables and the potential event of a flash fire to the hazard log of the 401 Type Tram and implement all identified mitigation actions.		
	Comment	On the 5th December 2014, Transdev advised by way of letter that they are of the opinion action has been taken to complete this safety recommendation.	Status: Complete
2014-016	Transdev should ensure that Alstom, as the contracted VMC, review the requirements for traction cables in the MIC bogie and produce and implement a suitable specification for this component. Installation procedures should also be reviewed to ensure that the free length requirements of these components are fulfilled.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-017	Transdev should ensure that Alstom, as the contracted VMC, review the performance requirements for the isolation protection system in the MIC bogie to ensure that it meets the requirements of the 401 hazard log or revise the 401 hazard log accordingly.		
	Comment	On the 5th December 2014, Transdev advised by way of letter that they are of the opinion action has been taken to complete this safety recommendation.	Status: Complete
2014-018	Transdev should ensure that Alstom, as the contracted VMC, review the defect priority matrix with regards to damage to traction cable insulation and fretting between these components and hydraulic hoses. In addition to this, maintenance procedures should be introduced to specify actions for the repair of traction cables.		
	Comment	On the 5th December 2014, Transdev advised by way of letter that they are of the opinion action has been taken to complete this safety recommendation.	Status: Complete

2014-019	Transdev should ensure that Alstom, as the contracted VMC, review their incident / accident investigation process to ensure that investigations are of sufficient depth and produce clear recommendations.		
	Comment	On the 5th December 2014, Transdev advised by way of letter that they are of the opinion action has been taken to complete this safety recommendation.	Status: Complete

Investigation report no.	R2014 – 005	**Issued**	7th November 2014
Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013			
Occurrence date	18th December 2013	**Location**	Kent Station (Cork)
Railway	IÉ	**Line**	Cork - Dublin
Recommendations			Total no. 3
2014-020	IÉ IM should identify all cast-iron structures on the network. From this, a risk-based approach should be taken in relation to the inspection of these assets, during routine inspections, in terms of any risks associated with cast-iron.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-021	IÉ IM should establish a formalised procedure for managing the risk associated with the adverse effects of high winds.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-022	IÉ IM should review the structural and annual inspection regimes for B&F to ensure all assets are inspected in accordance with the prescribed standards and any associated documentation is completed appropriately.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open

Investigation report no.	R2014 – 006	**Issued**	18th December 2014
Rock fall at Plunkett Station, Waterford, 31st December 2013			
Occurrence date	31st December 2013	**Location**	Plunkett Station (Waterford)
Railway	IÉ	**Line**	Mallow - Rosslare
Recommendations			Total no. 5

2014-023	IÉ IM CCE should complete a thorough review of CCE-STR-STD-2100 in relation to the application of condition ratings on assets to ensure that condition ratings are a true reflection of the condition of the asset; and that the appropriate inspection frequency is applied.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-024	IÉ IM CCE should complete a thorough review of the Cuttings, Embankments and Coastal/River Defences Inspection Card set out in CCE-STR-STD-2100 to ensure that Structures Inspectors have the correct means to complete the card without the requirement for alterations to templates or defined terms. The process of approval of these Inspection Cards should also be reviewed to ensure that they are reviewed and approved by the STSE.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-025	IÉ IM CCE should complete thorough reviews of CCE-STR-STD-2100 and CCE-STR-GDN-2802 in terms of maintenance requirements to ensure consistency throughout both documents.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-026	IÉ IM CCE should fully adopt the compliance verification process and ensure the process includes an effective means of reviewing the quality of documents completed by staff.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open
2014-027	IÉ IM CCE should review its Competence Management System in terms of both: its identification and tracking of mandated refresher training for Structures Inspectors competence; and its annual review of Structures Inspectors inspection work.		
	Comment	This recommendation is in progress and remains open as of end of 2014.	Status: Open

Appendix B – Investigations with recommendations closed prior to 2014

Investigation report no.	08011001	**Issued**	6th April 2009
Derailment of a Tara Mines freight train at Skerries, 10th January 2008			
Occurrence date	10th January 2008	**Location**	Tara Mines (Skerries)
Railway	IÉ		
Total number of recommendations:	2		
All recommendations were closed by February 2010.			

Investigation report no.	08061401	**Issued**	11th May 2009
Near miss at Ballymurray level crossing XM075, 14th June 2008			
Occurrence date	14th June 2008	**Location**	Ballymurray
Railway	IÉ		
Total number of recommendations:	2		
All recommendations were closed by February 2010.			

Investigation report no.	08073101	**Issued**	29th July 2009
Collision between a train and a road vehicle at level crossing XN125, Cappadine, on the Ballybrophy to Killonan line, 31st July 2008			
Occurrence date	31st July 2008	**Location**	Cappadine
Railway	IÉ		
Total number of recommendations:	2		
All recommendations were closed by December 2013.			

Investigation report no.	08120201	**Issued**	1st December 2009
Collision of a train with the gates of level crossing XH066, Bridgetown, on the Limerick Junction to Rosslare Strand line, 2nd December 2008			
Occurrence date	2nd December 2008	**Location**	Bridgetown
Railway	IÉ		
Total number of recommendations:	3		
All recommendations were closed by November 2010.			

Investigation report no.	09032901	**Issued**	4th March 2010
Collision of a Locomotive with Passenger Carriages at Plunkett Station in Waterford on the Dublin to Waterford line, 29th March 2009			
Occurrence date	29th March 2009	**Location**	Plunkett Station (Waterford)
Railway	IÉ		
Total number of recommendations:	2		
All recommendations were closed by November 2010.			

Investigation report no.	2010-R002	**Issued**	21st April 2010
Derailment of LUAS tram at Connolly Station, LUAS Red Line, Dublin City, 16th July 2009			
Occurrence date	16th July 2009	**Location**	Connolly (Dublin)
Railway	Veolia		
Total number of recommendations:	0		
No recommendations were made as a result of this investigation.			

Investigation report no.	R2013 – 001	**Issued**	28th February 2013
Tram collision with a bus on O'Connell St, 16th September 2009			
Occurrence date	16th September 2009	**Location**	O'Connell St (Dublin)
Railway	Veolia		
Total number of recommendations:	0		
No recommendations were made as a result of this investigation.			

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