Railway Accident Investigation Unit

Ireland

Annual Report

2015

RAIU

Railway Accident Investigation Unit

Foreward

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 safety recommendations to prevent their reoccurrence or otherwise improve railway safety. It is not the purpose of an investigation to attribute blame or liability.

Thirty-five preliminary examination reports (PERs) were carried out in 2015; from which three full investigations were commenced. The first full investigation was into a dangerous occurrence between Ballybrophy and Portlaoise during maintenance work on 12th September 2015. The other two full investigation involved low rail adhesion occurrences (LRA) at Ardrahan on the 23rd of October 2015 and at Castleconnell on the 28th November 2015.

The RAIU published two investigations reports in 2015 relating to two occurrences that took place in 2014. The investigations were as follows:

- Vehicle struck by train at Corraun Level Crossing, XX024 12th February 2014;
- Car strikes train at Level Crossing, XM250 Knockaphunta ,8th June 2014.

A total of four new safety recommendations were issued as a result of these 2015 investigations. 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 2015, and is likely to be published in early 2016.

As of the end of 2015, the RAIU have issued a total of one hundred and fourteen safety recommendations since the appointment of a Chief Investigator for the RAIU 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 one hundred and twenty eight safety recommendations issued to date (both by the RAIU and the RSC), eighty-four have been closed out as having been addressed, twenty-four are complete and awaiting verification that they have been addressed, and a further twenty remain open.

Within the unit, a position for a Senior Investigator became vacant in October 2012, and remained vacant at the end of 2015. The shortfall in resources continues to be an ongoing concern and at times has had an adverse effect on the RAIU's output and ability to maintain a 24/7 on call facility.

David Murton
Chief Investigator

Contents

General Information & Non-Investigation Activities

The Organisation

The Organisation

The RAIU comprises a Chief Investigator and a team of two full time Senior Investigators, each with the ability to perform the role of Investigator in Charge, as necessary. A third Senior Investigator position became vacant in October 2012, and as of the end of 2015 a vacancy still remained. The RAIU also has an administrator assigned to the unit.

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 (which provides for railway accident and incident investigation and reporting) of Directive 2004/49/EC on safety of the Community's railways. These Regulations provide for the establishment, of the national investigation body (NIB), the RAIU, in the Department of Transport, Tourism & Sport, to investigate railway accidents and incidents in accordance with these Regulations. These regulations are fully enacted and there was no further impact on the RAIU in 2015.

For full details of the changes to Irish legislation and other relevant European & Irish Legislation, see Appendix 1.

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 further information on these organisations', see Appendix 2.

Non-investigation 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 European Railway Agency (ERA). To this end, the RAIU participated in the 2015 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 continues to participate in Memorandums of Understanding with the Transportation Safety Board of Canada, the Rail Accident Investigation Branch of the United Kingdom and with the Irish Health and Safety Authority (HSA). The RAIU also continued to work with both An Garda Síochána and the Coroner's Society of Ireland.

The RAIU engaged in consultation on the 'Forth Railway Package'. The proposal entails a recast of the Railway Safety Directive (2004/49/EC) on safety on the Community's railways which was adopted to provide a common regulatory framework for railway safety. The Railway Safety Directive established a framework for harmonising the content of safety rules, safety certification and the investigation of accidents. The proposed Directive will also give ERA sole responsibility for authorising the placing on the market of certain vehicle types. The proposal also aims to clarify existing provisions of Directive 2004/49/EC, add new definitions and make changes to reflect other legislative changes adopted since the directive came into force.

Investigation Activities

RAIU

Investigation Activities

Summary of Preliminary Examination Reports during 2015

1st January 2015 to 31st December 2015

These indicate the PERs undertaken by the RAIU into occurrences on the railways in 2015. A PER is created upon the notification of an occurrence from a railway organisation.

For the definitions and classification of Occurrences & the investigation of occurrences by the RAIU and other bodies, see Appendix 3.

Railway Body	Date of occurrence	Location of Occurrence	Classification of Occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ	23 January 2015	Portarlington – Ballybrophy, Laois	Serious Accident	To persons due to rolling stock in motion	A man was struck and fatality injured by the 17:30 hrs Portlaoise to Heuston Service when he deliberately placed himself in a position of danger.	**1 Fatality** due to deliberate self-harm
IÉ	30 January 2015	Claremorris – Ballyhaunis, Mayo	Incident	Other	A body was found close to the railway line, however, the death was not as a result of rolling stock in motion; and investigated by An Garda Síochána.	**1 Fatality** due to actions unrelated to IÉ.
IÉ	3 February 2015	Tara Mines, Meath	Accident	Derailment	As a locomotive was hauling empty wagons during a run-around movement, the wheels of the third axle derailed as it travelled over a set of hand points.	0
Transdev	10 February 2015	Naas Road, Dublin	Accident	To persons due to rolling stock in motion	A person trespassing on the line, entered a segregated section of LUAS line. The LUAS driver applied the emergency brakes, activating the body catcher. The person was struck by the LUAS and suffered a broken arm.	**1 Injury** due to trespass
Transdev	30 March 2015	Fettercairn Station Platform	Accident	Other	A car, being pursued by An Garda Síochána, entered a segregated of track at Fettercairn LUAS Platform, and struck the doors of the LUAS. A passenger was taken to hospital with an eye injury.	**1 Injury** due to trespass
IÉ	9 April 2015	North Wall Depot, Dublin	Accident	Derailment	During a run-around movement, the front two wheels of a locomotive derailed as it travelled over a set of trailing points.	0
IÉ	14 April 2015	Howth Junction Station, Dublin	Accident	To persons due to rolling stock in motion	A freight service struck a woman at Howth Junction Station after she deliberately jumped in front of the train; she suffered non-life threatening injuries.	**1 Injury** due to deliberate self-harm
IÉ	27 April 2015	Newbridge – Sallins, Kildare	Incident	Other	As a van with three permanent way staff members on board was leaving a worksite adjacent to the railway line; the driver accidently placed the van in reverse and reversed onto the railway line, fouling one of the lines. One of the staff requested signal protection from the signalman and the van drove to a place of safety.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	11 May 2015	Smithfield, Dublin	Accident	To persons due to rolling stock in motion	A child cyclist made minor contact with a LUAS, travelling inbound, after the child entered the tramway from an adjacent footpath. A passenger alleged a neck injury as a result of the accident and was transported to hospital.	**1 Injury** to tram passenger
IÉ	11 May 2015	Waterford Yard	Accident	Collision	During shunting movements being undertaken in Waterford Yard, a train collided with the running boards of a stationary locomotive which was stabling forward of the fouling point.	0
IÉ	12 May 2015	Ocean Pier, Dublin Port	Accident	Collision	During a run-around movement, a locomotive struck a buffer stop, dislodging it from its normal position. There was no damage to the locomotive.	0
Transdev	25 May 2015	Suir Road – Davitt Road Junction, Dublin	Accident	Other	As the LUAS was proceeding across the junction after receiving a proceed signal, a car broke the red traffic lights and made contact with the side of the LUAS.	0
IÉ	1 June 2015	Westport Yard, Mayo	Accident	Collision	While preparing a timber train, the shunter released the handbrake of timber wagons, resulting in the wagons running-away and striking a stationary locomotive which in turn struck a buffer stop, slightly damaging the buffer stop.	0
IÉ	6 June 2015	Heuston Station, Dublin	Incident	Rolling Stock	During a normal passenger service, a member of the Chief Mechanical Engineers (CME) department noticed that passengers were having difficulty accessing the train at Heuston Station. On checking the situation, the CME staff member noticed that some of the doors were enabled on the wrong side (wrongside door failure). The train was taken out of service and it was found that a wire had been placed in reverse during the train's previous maintenance.	0
Transdev	24 June 2015	Capel Street, Dublin	Accident	To persons due to rolling stock in motion	As a LUAS proceeded outbound from Jervis Station, a male entered the tram corridor and was struck by the tram. He was taken to hospital with reported injuries to his arm and shoulder.	**1 Injury**
IÉ	9 July 2015	Kildare – Cherryville, Kildare	Incident	Rolling Stock	As the freight train driver was approaching Cherryville Junction he noticed braking system warning light, he stopped the train and on inspection found the couplers had separated.	0
IÉ	12 July 2015	Fairview Depot, Dublin	Accident	Collision	During a shunting movement, an Electric Multiple Unit (EMU) collided with another EMU, resulting in both EMUs derailing.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ	13 July 2015	Maintenance Depot, Limerick	Accident	Derailment	Two units of a train were coupled with two other units over a set of handpoints. As the four unit train travelled forward, the two rear units began to travel in an opposing direction to the front two units as the points were not correctly set; which resulted in the derailment of one of the rear units.	0
Transdev	17 July 2015	Abbey Street/Liffey Street Junction, Dublin	Incident	Energy	As the tram was traversing through the junction it lost power, this was due to damage to the catenary system, which in turn damaged the pantograph.	0
IÉ	5 August 2015	Killiney Station, Dublin	Incident	Rolling Stock	As the driver was operating the service he noticed that the blue lights for the door being closed was illuminating faster than normal, this was as a result of arcing in the associated electrics.	0
IÉ	27 August 2015	Drogheda, Louth	Accident	Derailment	As an eight piece Diesel Multiple Unit (DMU) was travelling into Drogheda Maintenance Depot, the first three units correctly travelled towards the depot, however, the next five units began travelling on another road as the points had not been properly secured.	0
IÉ	8 September 2015	Bray-Greystones, Wicklow	Incident	Other	A man broke his leg while trespassing near the railway line.	**1 Injury** due to trespass
IÉ/ Balfour Beatty Rail Ireland (BBRI)	12 September 2015	Ballybrophy – Portlaoise, Laois	Incident	Traffic Operations & Management	As BBRI maintenance staff and IÉ protection staff were carrying out activities during a possession, a train passed through the worksite without them having prior notification. This was as a result of changes to the possession which were not communicated to some of the staff present on the possession.	0
Transdev	25 September 2015	Abbey Street/ Liffey Street Junction	Accident	To persons due to rolling stock in motion	A male was pushed into a moving tram, by a member of the group he was with, who appeared to be intoxicated. He was uninjured but an ambulance was called as a precaution.	0
IÉ	6 October 2015	Sallins Station, Kildare	Serious Accident	To persons due to rolling stock in motion	A women deliberately placed herself in a place of danger by stepping off the platform as a train approached. She was fatality injured.	**1 Fatality** due to self-harm
IÉ	19 October 2015	North Wall Depot, Dublin	Accident	Collision	During a shunting movement within the depot, a freight train was routed down the wrong road, where it struck some disused wagons and a plough van, which in turn struck a buffer stop, derailing the plough van.	0
IÉ	23 October 2015	Fairview Depot, Dublin	Accident	Derailment	During shunting movements in the depot, the EMU became derailed as it passed over points.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ	23 October 2015	Ardrahan, Galway	Incident	Other	As a train was travelling in damp weather, the train began to experience low rail adhesion (LRA) conditions, resulting in the train overrunning Ardrahan Station Platform, passing a signal at danger and travelling through a level crossing with the barriers raised to road traffic.	0
Transdev	23 October 2015	Suir Road, Dublin	Incident	Other	As a tram was travelling outbound toward the Suir Road Stop, a car (believed to be stolen) struck the rear of the LUAS resulting in injuries to six passengers.	**6 Injuries**
IÉ	13 November 2015	North Wall Depot, Dublin	Accident	Derailment	A locomotive and six wagons was travelling to Dublin Port when three of the wagons derailed enroute.	0
Transdev	25 November 2015	Abbey Street, Dublin	Accident	To persons due to rolling stock in motion	As a man tried to cross the tram lines, he stepped out from in front of a bus and directly into the path of a moving tram and suffered minor injuries.	**1 Injury**
IÉ	28 November 2015	Castleconnell, Limerick	Accident	Other	As a train approached a level crossing he experienced LRA conditions, resulting in the train travelling past a signal at danger and striking the barriers of a level crossing which were closed against the railway line.	0
IÉ	18 December 2015	Harmanstown, Dublin	Incident	Rolling Stock	On departing Connolly Station, the guard on the train noticed that one of the doors of the train was not fully closed. At Harmanstown the guard and driver inspected the door and the driver noticed that the door interlock light was illuminated when the door remained open. An investigation was conducted by Northern Ireland Railways (NIR).	0
IÉ	29 December 2015	Killeen, Kerry	Accident	Collision	As a train travelled between Mallow and Tralee it struck a landslip in the Killeen area. There was no damage to the train.	0
IÉ	30 December 2015	Enniscorthy, Wexford	Incident	Other	Due to severe flooding the railway line in the locality was closed. It was reported to the RAIU as it was expected to be closed for a long period of time.	0

Summary of Full Investigations commenced in 2015

1st January 2015 to 31st December 2015

From the thirty-five PERs, two full investigations (into three of these PERs) were commenced.

Dangerous Occurrence between Ballybrophy to Portlaoise, 12th September 2015

On Saturday morning, 12th September 2015, a BBRI were carrying out maintenance works on the Dublin to Cork; the works were being undertaken in a possession under the supervision of IÉ staff.

At 05:40 hrs an empty passenger train travelling from Laois Train Care Depot to Mallow passed through the ballast cleaning location. The BBRI staff, who were attempting repairs to the ballast cleaner at the time, were unaware of the approach of this train, but were in a position of safety and the train passed through the location, and as such there were no fatalities or injuries as a result of this incident.

Operational Incidents at Ardrahan, 23rd October 2015 & Castleconnell on the 28th November 2015

On the 23rd October, as a train was travelling in damp weather, the train began to experience LRA conditions, resulting in the driver not being able to fully control the train causing the train overrunning Ardrahan Station Platform, passing a signal at danger and travelling through a Level Crossing XE156 with the barriers raised to road traffic.

On the 28th October 2015, as a train was travelling in damp weather, the train began to experience LRA conditions resulting in the driver not being able to fully control the train resulting in the train travelling past a signal at danger and striking the barriers of a level crossing which were closed. Both incidents involved the same Class 2600 rolling stock.

Summary of Full investigations which continued through 2015

The investigation into SPADs on the IÉ Network commenced in late 2013 and continued through 2015.

Investigation into SPADs on IÉ Network, from January 2012 to June 2015

On the 8th December 2013, two trains were travelling towards each other in the same section of track, only stopping when the signalman made a call for the trains to stop, the trains stopped 175 m apart at Millstreet Station Platform. As part of the initial RAIU investigation, the RAIU reviewed other Category A SPADs in IÉ in 2013; and although none of these SPADs resulted in fatalities, the consequences of SPADs can lead to multiple fatalities.

The decision was also made to expand the investigation to include all Category A SPADs from January 2012 to June 2015, inclusive, in order to see if there were any trends into the types and causations of SPADs on the IÉ network. A total of forty-five SPADs were reviewed by the RAIU. These Category A SPADs were divided into different event types, namely:

- SPADs during normal train operations;
- SPADs during degraded train operations;
- Start Against Signal (SAS) and Start on Yellow (SOY) SPADs.

The investigation in focusing on three main SPADs, the SPADs at Millstreet on the 8th December 2013, the SPAD at Gortavogher on the 19th December 2013 and the SPAD at Muine Bheag on the 9th April 2013 as these best reflect the SPAD event type on the IÉ network i.e. SPADs during normal train operations, SPADs under degraded train operations and SAS /SOY SPADs, respectively.

Full Investigations Published in 2015

1st January 2015 to 31st December 2015

The RAIU published two investigation reports in 2015, which resulted in a total of four new safety recommendations.

Vehicle struck by train at Corraun Level Crossing XX204, Co. Mayo, 12th February 2014

At approximately 09:55 hours (hrs) on Wednesday 12th February 2014, a post van approached Corraun Level Crossing with the gates open and drove onto the level crossing. At the same time, an IÉ passenger service from Ballina 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. He suffered serious injuries.

The immediate cause of the accident was that the van did not stop, as required, at the Level Crossing and drove into the path of the oncoming train. Contributory factors associated with the accident are:

- The gates at the level crossing were secured open, allowing the van to enter the level crossing without stopping;
- The level crossing was regularly misused by the local users, whereby the gates are regularly tied open.

The underlying causes associated with this accident are:

- There is a history of misuse at the level crossing; with local users regularly misusing the level crossing;
- IÉ did not take sufficient actions at the level crossing to prevent its regular misuse, despite the RAIU making a safety recommendation related to preventing level crossing misuse in 2009 and re-iterating in 2011.

An additional observation in this accident is:

- The addition and purpose of the decision point line on user worked level crossings is not obvious to users of the Level Crossing and may cause confusion with statutory stop lines still at some level crossings.

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

- IÉ should consider options to upgrade the crossing to minimise direct action by the users;
- IÉ should carry out a full review of known misused user worked level crossings on public and private roads and either upgrade the level crossing or introduce measures to minimise their misuse;
- IÉ should ensure that where a Decision Line is present at a level crossing, that the purpose of this Decision Line is appropriately conveyed to the level crossing users.

Car strikes train at Level Crossing XM 250, Knockaphunta, Co. Mayo

At approximately 18:42 hrs on Sunday 8th June 2014, a passenger service from Dublin to Westport was approaching Knockaphunta Level Crossing XM250, 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, the driver was unhurt.

The immediate cause of the accident was that a car did not stop at the level crossing and drove into the side of the passing train. Contributory factors associated with accident are:

- The gates at the level crossing were open when the car approached the level crossing, allowing the car to enter onto the level crossing without stopping;
- The level crossing was regularly misused by the local users, whereby the gates are regularly left open.

The underlying cause associated with this accident is the fact that the many actions IÉ have taken in response to previous RAIU safety recommendations (2009 and 2011), have not resolved the issue of level crossing users leaving the gates open.

An additional observation to this accident is that the addition and purpose of the 'new Stop Line' on user worked level crossings is not obvious to users of the level crossing and may cause confusion with the statutory Stop Lines used previously at some level crossings.

As a result of the accident, the RAIU has reiterated two safety recommendations associated with the accident:

- 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;
- IÉ should carry out a full review of known misused user worked level crossings on public and private roads and either upgrade the level crossing or introduce measures to minimise their misuse.

The RAIU also reiterate a recommendation related to an additional observation made during the investigation:

- IÉ should ensure that where a Decision Line is present on a user worked level crossing, that the purpose of this Decision Line is conveyed to the level crossing users.

The RAIU have issued one new recommendation in relation to an additional observation made during the investigation:

- The RSC, RSA and IÉ in consultation with any relevant stakeholders should agree a common policy in connection with instructions and warnings related to user worked level crossings.

Tracking Safety Recommendations

RAIU

Railway Accident Investigation Unit

Tracking Safety Recommendations

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. The figure below 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. 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	Implementer has taken measures to effect the recommendation and the RSC is considering whether to close the recommendation. 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	Implementer has taken measures to effect the recommendation and the RSC has considered these and has closed 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.

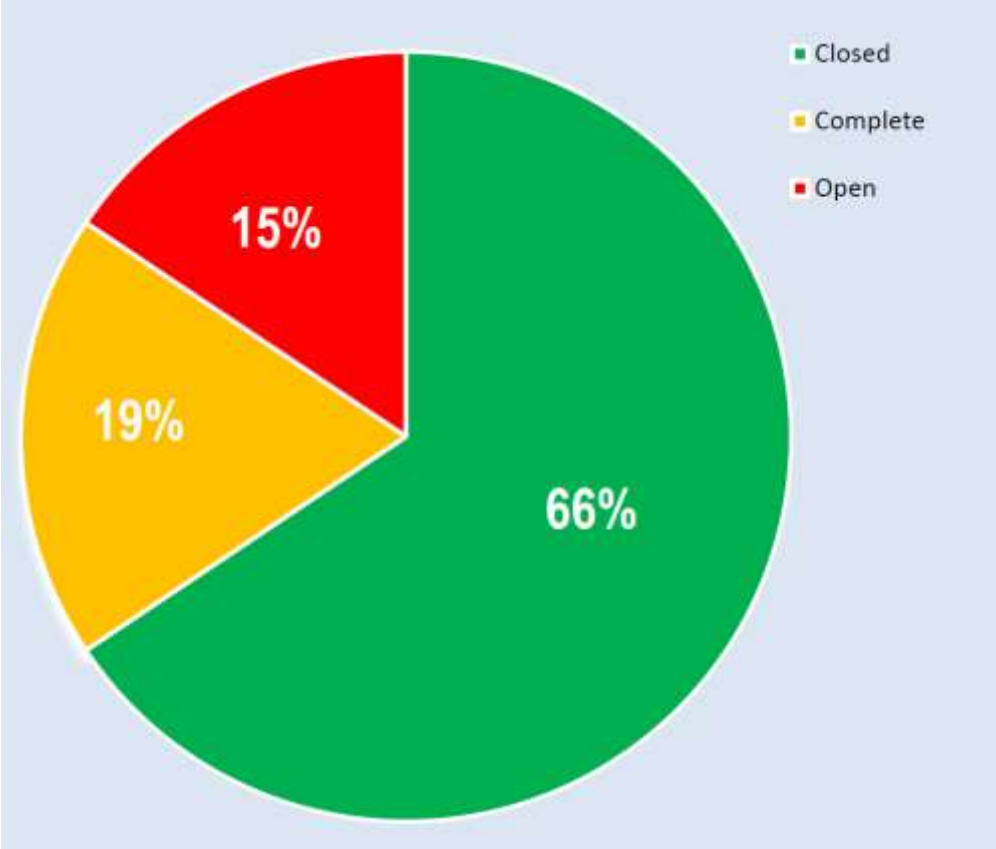
Status of RAIU safety recommendations

The RSC, as the National Safety Authority (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 2015 and the recommendations are listed in chronological order by investigation report. Investigation reports where all recommendations have been closed prior to 2015 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 2015, the RAIU have made 128 recommendations (including the fourteen recommendations made by RSC in its investigation report published in 2006 on the Derailment of a Freight Train at Cahir Viaduct in 2003). All recommendations were accepted by their addressee and implementer. The status of the recommendations as of the end of 2015 is included in below.

Year	Number of Reports	Number of Recommendations	Status of Recommendations		
			Open	Complete	Closed
2006*	1	14	0	0	14
2007	0	0	0	0	0
2008	1	7	0	0	7
2009	5	13	0	0	13
2010	6	26	2	2	22
2011	6	17	2	10	5
2012	3	13	2	5	6
2013	3	10	4	4	2
2014	6	27	8	2	17
2015	2	4	3	1	0
Totals	33	128	20	24	84

The overall progress with the closure of recommendations, in 2015, is shown in the pie-chart below. Of the 128 recommendations: 66% have been closed; 19% have been completed and 15% remain open; this is an overall improvement compared to 2014, where only half the recommendations were closed.



RAIU Safety recommendations closed in 2015

This section identifies the safety recommendations closed in 2015.

Report	Recommendation	Actions taken to close the recommendation
Inquiry into the Derailment of a Freight Train at Cahir Viaduct on 7th October 2003 (published July 2006)	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.	IÉ have determined that the train radio is effective on the majority of the lines; on lesser used lines Mode C is used; in communication black spots the train radio is augmented with mobile phones or line side telephones. The RSC deem this to be acceptable and have closed the recommendation.
Collision at Level Crossing XN104 between Ballybrophy and Killonan, 28th June 2007 (published 18/06/08)	IÉ to review the various sources of information relevant to level crossings & develop a standard, or suite of standards, consolidating information on: civil engineering specifications; signage specifications; visibility of approaching trains; & inspection and maintenance. Ensuring effective & compliance.	A new standard has been developed, with final changes to signage specification (in particular to level crossings made in 2014). The document has been reviewed by the RSC, and deemed acceptable, and as a result have closed the recommendation.
	IÉ to develop and implement a vegetation management programme that addresses vegetation management on a risk basis, prioritising high risk areas.	A new standard was completed, CCE-TMS-381, Control and management of vegetation in 2012. The RSC audited this standard in 2013 and the deemed the standard acceptable and have closed the recommendation.
Fatality at Level Crossing XX032 between Ballina and Manulla Junction, 28th February 2008 (published 02/03/09)	IÉ must identify crossings that are regularly misused and take proactive action to manage the increased risk created by this misuse.	IÉ have identified all misused level crossings and have conducted safety awareness campaigns at two of these level crossings, in conjunction with the Garda Síochána and local authorities, which the RSC deemed to be acceptable and have now closed the recommendation.
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 (published 16/08/10)	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.	IÉ produced document, CCE-QMS-005-018, 'Response procedure within CCE to potential safety incidents reported by 3rd Parties'. In 2015 further forms were added for the recording of the inspection, which were reviewed by the RSC, who deemed these to be acceptable and have closed the recommendation.
	IÉ should review their network for historic maintenance regimes and record this information in their information asset management system (IAMS). For any future maintenance regimes introduced on the network, IÉ should also record this information in IAMS	In 2014, IÉ completed inputting data into their asset database, IAMS. In 2015, the RSC completed an audit of IAMS, picking assets at random and checking the information in IAMS, and were satisfied with the information and have closed the recommendation.
	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.	IÉ completed digitising the information in 2012, uploaded the information in 2013. The RSC reviewed IÉ's evidence in relation to completing the recommendation and deemed this to be acceptable and have closed the recommendation.
Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th November 2009 (published 15/11/10)	IÉ should review their structures list & 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 & adopted at the frequency requirements set out by the Structural Inspections Standard, I-STR-6510.	IÉ engaged an external consultant. All structures were identified and a programme of inspections developed. The RSC reviewed the evidence and have deemed the evidence acceptable and have closed the recommendation.
	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 & geotechnical properties of cuttings; & from this information identify any cuttings that are vulnerable to failure.	IÉ have carried out aerial surveys of the cuttings and embankments; examined the outputs and developed an asset plan based on this information; as well as identifying area difficult to inspect and incorporating this information into the asset plan. The RSC have reviewed this information and deem it to be acceptable and have closed the recommendation.

Report	Recommendation	Actions taken to close the recommendation
DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013 (published 30/07/14)	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).	IÉ-RU advised that the coupler circuits were revised and this included a visual indicator in the cab. Evidence of this work was submitted to the RSC, and as a result of this, and in cab checks, the RSC deem this to be acceptable and have closed the recommendation.
	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.	IÉ have adopted processes to close recommendations and have presented this to the RSC, the RSC deem the process acceptable and have closed the recommendation.
Tram fire on approach to Busáras Luas Stop on the 7th November 2013 (published 28/08/14)	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 have undertaken this work and the RSC have reviewed the evidence, and have closed this recommendation.
	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 have undertaken this work and the RSC have reviewed the evidence, and have closed this recommendation.
	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 have undertaken this work and the RSC have reviewed the evidence, and have closed this recommendation.
	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 have undertaken this work and the RSC have reviewed the evidence, and have closed this recommendation.
	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.	Transdev have undertaken this work and the RSC have reviewed the evidence, and have closed this recommendation.
Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013 (Published 07/11/14)	IÉ-IM should establish a formalised procedure for managing the risk associated with the adverse effects of high winds.	IÉ-IM have developed a weather protocol in relation to managing risk during adverse weather conditions. The RSC have reviewed this information and the recommendation is now closed.
Rock fall at Plunkett Station, Waterford, 31st December 2013 (published 18/12/14)	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.	IÉ-IM have developed a new standard in relation to structures, their condition rating and the inspection frequencies, this information was sent to the RSC and the recommendation is now closed.

Report	Recommendation	Actions taken to close the recommendation
Rock fall at Plunkett Station, Waterford, 31st December 2013 (published 18/12/14)	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.	IÉ-IM have made the required changes and the information was sent to the RSC, who have accepted the information and closed the recommendation.
	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.	IÉ-IM has adopted a full compliance verification process, this process has been reviewed and deemed acceptable by the RSC; the recommendation is now closed.
	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.	IÉ-IM has introduced a new technical management standard, which the RSC have reviewed and deem acceptable; as a result, the recommendation is now closed.

* light blue indicates recommendations associated with IÉ & dark blue Transdev.

RAIU Safety recommendations complete in 2015

This section identifies the safety recommendations complete as of the end of 2015.

Report	Recommendation	Any actions taken to complete recommendation / no change
Derailment of an on track machine at Limerick Junction Station on the Dublin to Cork Line, 3rd July 2009 (published 10/06/10)	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.	This recommendation remains complete.
Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th November 2009 (published 15/11/10)	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.	In 2015, the RSC are considering a review of this recommendation, with a view to closing recommendation.
Laois Traincare Depot Derailment, 20th January 2010 (published 19/01/11)	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.	Procedures are now in place, the RSC are to review the documentation.
Secondary suspension failure on a train at Connolly Station, 7th May 2010 (published 05/05/11)	IÉ should ensure all work in rolling stock maintenance depots is carried out in accordance with its control process.	No change in status in 2015.
	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.	No change in status in 2015.
Gate Strike at Buttevant Level Crossing (XC 219), County Cork, on the 2nd July 2010(published 27/06/11)	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.	No change in status in 2015.
Person struck at level crossing XE039, County Clare, 27th June 2010 (published 11/07/11)	IÉ should ensure that risk assessments are produced for all user worked level crossings to identify all hazards specific to particular level crossings.	No change in status in 2015.
	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.	No change in status in 2015.
	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.	No change in status in 2015.
Road vehicle struck at level crossing XM096, County Roscommon, 2nd September 2010 (published 04/10/11)	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.	IÉ have sent the booklet to known users and held awareness events in relation to the safe use of level crossings. The RSC have changed the status to complete with further peer review required to close the recommendation.
Road vehicle struck at level crossing XM096, County Roscommon, 2nd September 2010 (published 04/10/11)	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.	IÉ have developed a new standard and the RSC are in the process of reviewing the documentation. No change in status.

Report	Recommendation	Any actions taken to complete recommendation / no change
Car Strike at Knockaphunta Level Crossing (XM250), County Mayo, 24th October 2010 (published 19/10/11)	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.	IÉ have stated that a temporary speed restriction is a "reasonable mitigation" for the level crossing. Further information requested by the RSC to close this recommendation.
Car Strike at Murrough Level Crossing XG 173, 14th February 2011 (published 08/02/12)	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.	New signage and booklet has been developed, the RSC have changed the status to complete, and a peer review is required to close the recommendation.
	IÉ should ensure that they adopt their own standards in relation to design changes to any PEIO that has the potential to affect safety.	No change in status in 2015.
Runaway locomotive at Portlaoise Loop, 29th November 2012 (published 19/09/13)	IÉ should review their VMIs for locomotives to ensure that there are adequate braking tests at appropriate intervals.	No change in status in 2015.
	IÉ should review their competency management system for train drivers to ensure that all driving tasks are routinely assessed.	No change in status in 2015.
Bearing failure on a train at Connolly Station, 18th October 2012 (published 26/09/13)	IÉ should put in place formal procedures governing the role of FTS staff in relation to HABDs.	No change in status in 2015.
Tractor struck train at level crossing XE020, 20th June 2012 (published 17/06/2013)	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.	No change in status in 2015.
	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.	No change in status in 2015.
Fog signal activation in Dart driving cab, Bray, on the 6th March 2012 (published 19/09/2013)	IÉ should introduce appropriate procedures and standards for the safe issue, storage and transportation of fog signals.	IÉ-RU has closed this recommendation, through the submission of documentary evidence. The RSC are awaiting briefing documents from IÉ-IM in order to close this recommendation, and as such, the recommendation remains complete.
	IÉ drivers (and other staff) should receive adequate training in the safe handling of fog signals.	The RSC are awaiting briefing documents from IÉ-IM, in relation to their gatekeepers in order to close this recommendation, and as such, the recommendation remains complete.
Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013 (Published 07/11/14)	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 has identified all similar assets and have developed a programme of inspections. The recommendation is now deemed complete.
	IÉ IM should review the structural and annual inspection regimes for Building & Facilities (B&F) to ensure all assets are inspected in accordance with the prescribed standards and any associated documentation is completed appropriately.	IÉ-IM has created a B&F Asset Compliance Section & new regimes have been developed. The recommendation is now deemed complete.
Car strikes train at Level Crossing XM 250, Knockaphunta, Co. Mayo, 8th June 2014 (published 04/06/15)	IÉ should ensure that where a Decision Line is present on a user worked level crossing, that the purpose of this Decision Line is conveyed to the level crossing users.	IÉ-IM consider this to be a stop line and do not this this recommendation warrants any action.

* light blue indicates recommendations associated with IÉ, dark blue Transdev & lilac the RSC.

RAIU Safety recommendations open in 2015

This section identifies the safety recommendations which remain open in 2015.

Report	Recommendation	Any actions taken in 2015/ no change in status
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 (published 16/08/10)	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.	In 2015, the RSC introduced a process to close this recommendation and an inspector has been assigned to the process.
	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.	In 2015, the RSC introduced a process to close this recommendation and an inspector has been assigned to the process.
Secondary suspension failure on a train at Connolly Station, 7th May 2010 (published 05/05/11)	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.	No change in status in 2015.
Tram derailment at The Point stop, Luas Red Line, 13th May 2010 (published 11/05/11)	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.	No change in status in 2015.
Car Strike at Murrough Level Crossing XG 173, 14th February 2011 (published 08/02/12)	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.	No change in status in 2015.
Runaway locomotive at Portlaoise Loop, 29th November 2012 (published 19/09/13)	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.	No change in status in 2015.
Tractor struck train at level crossing XE020, 20th June 2012 (published 17/06/2013)	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.	No change in status in 2015.
	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.	No change in status in 2015.
Fog signal activation in Dart driving cab, Bray, on the 6th March 2012 (published 19/09/2013)	IÉ should ensure that their procurement and quality control processes verify that goods received are of the correct specification as those ordered.	No change in status in 2015.

Report	Recommendation	Any actions taken in 2015/ no change in status
Trend Investigation: Possession incidents on the Iarnród Éireann network (published 27/01/14)	IÉ-IM 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.	No change in status in 2015.
	IÉ-IM 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.	No change in status in 2015.
	IÉ-IM should undertake a review of possession incidents that have occurred over the last four years to ensure that reports are completed & recommendations are identified and addressed.	No change in status in 2015.
Operating irregularity during Single Line Working between Dundalk and Newry, 23rd March 2013	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.	No change in status in 2015.
	IÉ should review current communication procedures with regard to the updated communication equipment now available.	No change in status in 2015.
DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013 (published 30/07/14)	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.	No change in status in 2015.
Tram fire on approach to Busáras Luas Stop on the 7th November 2013 (published 28/08/14)	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.	No change in status in 2015.
Rock fall at Plunkett Station, Waterford, 31st December 2013 (published 18/12/14)	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.	No change in status in 2015.
Car strikes train at Level Crossing XM 250, Knockaphunta, Co. Mayo, 8th June 2014 (published 04/06/15)	IÉ should consider options to upgrade the crossing to minimise direct action by the users.	Recommendation issued in 2015.
	IÉ should carry out a full review of known misused user worked level crossings on public and private roads and either upgrade the level crossing or introduce measures to minimise their misuse.	Recommendation issued in 2015.
	The RSC, RSA and IÉ in consultation with any relevant stakeholders should agree a common policy in connection with instructions and warnings related to user worked level crossings.	Recommendation issued in 2015.

* light blue indicates recommendations associated with IÉ, dark blue Transdev & lilac the RSC.

Appendices

Appendix 1 – Irish & European Laws

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 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 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 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.

Appendix 2 – Railway Organisations

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. BBRI is part of the Balfour Beatty Group, and have been operating as an RU on IÉ's rail system since March 2014. BBRI operate and maintain On Track Machines (OTMs) on behalf of IÉ. BBRI staff comprises of a number of OTM Driver Operators (OTMDOs) and fitter groups which are located throughout Ireland; their Safety Certificate is issued in conformity with European Directive 2012/34/EU and S.I. 249 of 2015. 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.

Appendix 3 – Classification of occurrences & investigations by the RAIU & other bodies

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.

RAIU 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.

Investigations by other bodies

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.

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