Railway Accident Investigation Unit

Ireland

Annual Report

2018

RAIU

Railway Accident Investigation Unit

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/s 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.

In 2018, fifty-two preliminary examination reports (PERs) were completed by the RAIU based on reports of incidents and accidents from Transdev and Iarnród Éireann (IÉ); including reports of: rolling stock faults; Road Rail Vehicle (RRV) occurrences; self-harm occurrences; earthworks failures; energy faults; tram and heavy rail derailments in depots; cattle strikes; tram road traffic collisions; fire; buffer stop collisions and one user worked level crossing collision accident.

Of the fifty-two PERs, three full investigations into individual incidents/accidents that occurred on the IÉ network, namely:

- Collision of an InterCity Railcar with a buffer stop at Laois Train Care Depot, 17th July 2018;
- Wrongside Door Failure at Ashtown Station, 12th August 2018;
- Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018.

In addition, a trend investigation into RRV incidents and accidents on the IÉ network was commenced, which includes the review of RRV occurrences from 2015 to 2018, inclusive.

One investigation report was published in 2018, 'Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017' resulting in a total of seven new safety recommendations being issued. The new recommendations related to: the training and competency of staff in terms of performance of duties and safety critical communications; management of major customer disruptions; the design and fitment of points clips; and, the placement of detonator protection.

As of the end of 2018, the RAIU have issued a total of 147 safety recommendations since the appointment of a Chief Investigator for the RAIU in 2007.

The Commission for Railway Regulation (CRR) monitors the implementation of safety recommendations and has advised that of the 147 RAIU safety recommendations issued to date, 112 have been closed out as having been addressed (which accounts for 76% of the recommendations), four are complete and awaiting verification that they have been addressed, and a further thirty-one remain open.

David Murton
Chief Investigator
July 2019

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The Organisation

The RAIU is the independent national investigation body (NIB) within the Department of Transport, Tourism and Sport (DTTAS) which conducts investigations into accidents and incidents on the national railway network, the Dublin Area Rapid Transit (DART) network, the LUAS network, heritage and industrial railways in Ireland. Investigations are carried out in accordance with the Railway Safety Directive 2004/49/EC enshrined in the European Union (Railway Safety) (Reporting and Investigation of Serious Accidents, Accidents and Incidents) Regulations 2014.

The RAIU comprises of a Chief Investigator and three Senior Investigators, each with the ability to perform the role of Investigator in Charge, as necessary. The RAIU also has an administrator assigned to the Unit.

The RAIU's remit

The RAIU investigate all serious accidents. A serious accident means 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.

During an investigation, if the RAIU make some early findings on safety issues that require immediate action, the RAIU will issue an Urgent Safety Advice Notice outlining the associated safety recommendation(s). When the RAIU consider a full investigation is not warranted the RAIU may issue a Safety Brief to reinforce the correct adherence to existing guidelines or standards that resulted in an accident or incident.

The RAIU may investigate and report on accidents and incidents which under slightly different conditions might have led to a serious accident.

The RAIU may also carry out trend investigations 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. The purpose of RAIU investigations is to make safety recommendations, based on the findings of investigations, in order to prevent accidents and incidents in the future and improve railway safety. It is not the purpose of an RAIU investigation to attribute blame or liability.

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 operated by Transdev;
- The Bord Na Móna industrial railway;
- Nine heritage & minor railway systems (of which four are currently not operational).

For further information on these organisations see Appendix 1.

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 Union (EU) Agency for Railways. To this end, the RAIU participated in the 2018 NIB plenary meetings and provided input on the direction of NIB related work. The RAIU is also a member of the EU Agency for Railways taskforce set up to develop a system of peer review of 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 has published guidance for Coroners' Courts and An Garda Siochána and has established a working relationship with the Garda Forensic Investigators through their training facility at Templemore.

Investigation Activities

RAIU

Investigation Activities

Summary of Preliminary Examination Reports during 2018

1st January 2018 to 31st December 2018

The following outlines the fifty-two PERs undertaken by the RAIU into occurrences on the railways in 2018. 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 2.

Railway Body	Date of occurrence	Location of Occurrence	Classification of Occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ	4 January 2018	Newry – Dundalk Line (near Belfast)	Incident	Infrastructure	Line closure reported due to earthworks subsistence on the Newry – Dundalk Line (close to Belfast).	0
IÉ	4 January 2018	Sallins Station, Kildare	Serious Accident	To persons due to rolling stock in motion	A female sat on the edge of the platform before jumping onto the tracks on the approach of a train; she was fatally injured.	**1 Fatality** due to self-harm
IÉ	8 January 2018	Killester Station, Dublin	Incident	Control-Command & Signalling	Power was removed from a section of track for the removal of a branch from the Overhead Line Equipment (OHLE); the signals were not set correctly, and a train entered into the de-energised section.	0
IÉ	9 January 2018	North Wall Freight Depot, Dublin	Accident	Derailment	A locomotive derailed after passing over gaping hand points; the locomotive travelled a further 105 feet before the wheels went into the ballast.	0
IÉ	11 January 2018	Rosshill, Galway	Serious Accident	To persons due to rolling stock in motion	A male, approached the barriers of a level crossing, jumped over the barriers and placed himself in front of an approaching train; he was fatally injured.	**1 Fatality** due to self-harm
IÉ	11 January 2018	Harmonstown, Dublin	Serious Accident	To persons due to rolling stock in motion	A male jumped in front of a train at Harmonstown Station; the train was not scheduled to stop.	**1 Fatality** due to deliberate entry onto railway
Transdev	31 January 2018	Sandyford Depot, Dublin	Accident	Derailment	A tram derailed during a shunting movement; as the points were incorrectly clipped and scotched.	0
IÉ	13 February 2018	Bayside, Dublin	Incident	Rolling Stock	There were reports of wrongside door failure on an Electrical Multiple Unit (EMU); however, on review youths had forcibly opened train doors.	0
Transdev	2 March 2018	Red Cow Depot, Dublin	Accident	Derailment	The rear bogie of a tram derailed, while crossing over points, during a shunting operation when there was heavy snow.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	2 March 2018	Red Cow Depot, Dublin	Accident	Derailment	The leading bogie of a tram derailed, while crossing over points, during a shunting operation when there was heavy snow.	0
IÉ	3 March 2018	Lansdowne Road, Dublin	Accident	To persons due to rolling stock in motion	A person attempted to climb from the track to the platform as a train was departing the station and was struck by the train; receiving serious injuries.	**1 Serious Injury** due to attempted self-harm
IÉ	6 March 2018	Arklow, Wicklow	Incident	Infrastructure	A section of track was washed out on the Dublin to Wexford line; it was found by a track patroller; and the line was closed.	0
IÉ	15 March 2018	Carrick-on-Shannon to Clonmel	Incident	Infrastructure	A driver reported a section of the cess had washed away between Carrick-on-Shannon and Clonmel. The line was closed.	0
IÉ	22 March 2018	Thurles (Tipperary) – Portlaoise (Laois)	Accident	Collision	One RRV struck another RRV when travelling in convoy; there were no injuries.	0
IÉ	22 March 2018	Killiney – Shankill, Dublin	Serious Accident	To persons due to rolling stock in motion	A person lay down on the tracks before being struck, and fatally injured, by an approaching train.	**1 Fatality** due to self-harm
IÉ	30 March 2018	Drogheda, Dublin	Incident	Rolling Stock	A De Dietrich Coach was preparing to depart Drogheda Station when the driver saw that the door interlock light was illuminated (to indicate that the doors are closed) while a door remained open. The train was taken out of service.	0
IÉ	5 April 2018	Bray – Greystones, Dublin	Incident	Infrastructure	A train lost power due to damage of OHLE infrastructure Tunnel 3.	0
IÉ	10 April 2018	Sallins – Newbridge, Kildare	Accident	Collision	Two RRVs collided when travelling in a convoy of five; minor damage to RRV.	0
IÉ	23 April 2018	Inchicore, Dublin	Accident	Derailment	071 Locomotive 083 derailed as it travelled over hand-operated points at Inchicore Works; it was found that the points were gaping.	0
IÉ	27 April 2018	Broombridge, Dublin	Incident	Traffic Operations & Management	An RRV was placed on the line without the required possession being granted.	0
IÉ	15 May 2018	Howth Junction, Dublin	Serious Accident	To persons due to rolling stock in motion	A male jumped from the platform in front of an approaching train when he was struck and fatally injured by an approaching train.	**1 Fatality** due to self-harm

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ	18 May 2018	Bray, Wicklow	Accident	Fire	A fire ignited at Bray Signalling Relay Room resulting in the disruption to services.	0
IÉ	1 June 2018	Inchicore, Dublin	Incident	Traffic Operations & Management	An RRV on-tracked at Inchicore without the required possession arrangements being in place.	0
IÉ	5 June 2018	Harmonstown, Dublin	Serious Accident	To persons due to rolling stock in motion	A person was agitated on the phone on the platform at Harmonstown Station before placing himself in front of an approaching train and being fatally injured.	**1 Fatality** due to self-harm
IÉ	16 June 2018	Drogheda (Louth) – Skerries (Dublin)	Accident	Collision	One RRV reversed and collided with another RRV at a worksite during a possession.	0
Transdev	22 June 2018	Belgard Square North, Dublin	Accident	Collision	A car attempted to cross the junction without having the proceed signal and collided with a tram.	0
IÉ	28 June 2018	Tullamore, Offaly	Accident	Collision	A passenger train struck eight cows causing significant damage to the train; approximately 185 passengers were transferred from the train.	0
IÉ	28 June 2018	Kildare Station	Accident	Collision	An RRV collided with a Tamper as it passed over points at Kildare Station during tamping works.	0
IÉ	5 July 2018	Inchicore Works, Dublin	Accident	Derailment	A Mk2 derailed over a set of hand points during a shunting manoeuvre.	0
IÉ	13 July 2018	Bray, Wicklow	Incident	Infrastructure	A gorse fire close Tunnel 3 resulted in debris causing damage to the signalling and telecoms equipment, resulting in line closures.	0
IÉ	14 July 2018	Pearse – Connolly, Dublin	Incident	Control-Command & Signalling	The Continuous Automatic Warning System (CAWS) incorrectly displayed an upgrade; however, the driver noticed the fault and reported it.	0
IÉ	17 July 2018	Portlaoise, Laois	Accident	Collision	An ICR, in LTCD, collided with a buffer stop during a shunting manoeuvre.	0
IÉ	19 July 2018	Connolly Yard, Dublin	Accident	Collision	A 29000 DMU collided with a buffer stop at Connolly Yard.	0
IÉ	26 July 2018	Portmarnock Station, Dublin	Serious Accident	To persons due to rolling stock in motion	A male jumped from the platform in front of an approaching train in an act of self-harm and was fatally injured.	**1 Fatality** due to self-harm
IÉ	29 July 2018	Fairview Depot, Dublin	Accident	Derailment	A 4-car DART EMU derailed over a set of hand-points in Fairview Depot; the points were found to have too much tension in them after maintenance.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Trandev	1 August 2018	Belgard Road Junction, Dublin	Accident	Collision	Three cars travelled through a red light at the Belgard Road Junction; with the third car colliding with the tram.	0
Transdev	11 August 2018	Benburb Junction, Dublin	Accident	To persons due to rolling stock in motion	A male walked out in front of a tram without looking; sustaining injuries to his knee.	**1 Injury** due to trespass
Transdev	11 August 2018	Benburb Junction, Dublin	Accident	To persons due to rolling stock in motion	A female deliberately placed herself in a position of danger by stepping in front of a tram; she received no injuries.	0
IÉ	12 August 2018	Ashtown, Dublin	Incident	Rolling Stock	A driver reported the incorrect illumination of the blue door interlock light on a 29000 Class train; it was reported later that there was an issue with the coupler.	0
IÉ	17 August 2018	Claremorris, Mayo	Accident	Level Crossing	A train struck a Mayo County Council truck when it drove through a user worked level crossing.	**2 Serious Injuries** to train and truck drivers.
IÉ	29 August 2018	South of Kilkenny Station, Kilkenny	Serious Accident	To persons due to rolling stock in motion	A female placed herself on the track in front of an approaching train and was struck and fatally injured.	**1 Fatality** due to self-harm
Transdev	19 September 2018	Ranelagh, Dublin	Incident	Energy	Sections of the Green Line would be closed for greater than six hours due to significant damage to the OHLE as a result of tree falls from high wind speeds due Storm Ali.	0
IÉ	21 September 2018	Navan Road Parkway Station, Dublin	Accident	To persons due to rolling stock in motion	A trespasser was clipped by a passing train; he received no injuries and left the station.	0
IÉ	22 September 2018	Thomastown, Kilkenny	Accident	Collision	A train collided with a herd of cattle who accessed the track by scaling an embankment; there was significant damage to the train and it was removed from service.	0
IÉ	24 September 2018	Inchicore Works, Dublin	Accident	Derailment	The lead bogie of a locomotive with five Mk4 carriages derailed over a set of hand points which were being held by a shunter.	0
Transdev	4 October 2018	Broombridge Depot, Dublin	Accident	Collision	A tram made contact with a stabled tram in a depot, with the driver of the tram not reporting the collision; and then reversed the tram without authority.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	8 October 2018	Gallops Junction, Dublin	Accident	Collision	A car proceeded through a junction against a stop signal and was struck by a tram	**1 Injury** to tram driver
IÉ	31 October 2018	Clontarf Station, Dublin	Incident	Rolling Stock	A blue door interlock light was illuminated, indicating the doors were closed, when one door remained open.	0
IÉ	14 November 2018	Connolly, Dublin	Accident	Collision	An RRV collided with stabled carriages in Connolly sidings.	0
IÉ	18 November 2018	Drumcondra, Dublin	Incident	Rolling Stock	Smoke was reported on a Class 22000 at Drumcondra Station, passengers were evacuated as a precaution.	0
IÉ	24 November 2018	Sallins, Kildare	Serious Accident	To persons due to rolling stock in motion	A person was struck on the line between Newbridge and Sallins and fatally injured in an act of self-harm.	**1 Fatality** due to self-harm
Transdev	7 December 2018	Belgard Junction, Dublin	Accident	Collision	A van travelled against a stop signal and collided with a tram at Belgard Junction.	**0**

In summary, removing the eleven self-harm and trespass occurrences (nine fatalities), IÉ have reported:

- Accidents:
  - Five RRV accidents;
  - Five derailments in depots;
  - Two collisions with cattle;
  - Two collisions with buffer stops;
  - One level crossing accident at a user worked level crossing;
  - One fire at a signalling relay room.

- Incidents:
  - Five rolling stock incidents (four of which were related to doors);
  - Five infrastructure incidents (three of which were related to earthworks) resulting in line closures;
  - Two control-command and signalling incidents;
  - Two RRV incidents.

In relation to Transdev, removing one self-harm accident, Transdev have reported:

- Accidents:
  - Six collisions (four with road vehicles, one with a pedestrian and one with another tram);
  - Three derailments in depots.

- Incident:
  - One related to energy outage during Storm Ali as a result of OHLE damage.

Summary of Full Investigations commenced in 2018

1st January 2018 to 31st December 2018

Three full investigations, and one trend investigation, into reported occurrences were commenced in 2018:

- Collision of an InterCity Railcar with a buffer stop at Laois Traincare Depot, 17th July 2018;
- Wrongside Door Failure at Ashtown Station, 12th August 2018;
- Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018;
- RRV occurrences on IÉ Network, 2015 – 2018.

Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018

On the 17th July 2018 an IÉ InterCity Railcar, set 16 (ICR 16), was required to be shunted from Road 6B to Road 8 in Laois Traincare Depot (LTCD) to allow maintenance repairs to be carried out on the set following a collision with cattle at Tullamore (Offaly) on 28th June 2018.

The Chief Mechanical Engineer (CME) Driver and Limited Shunter checked the "Handover Notes" and the "Set Stopped – Reason" on the "Daily Production Board" in the Duty Manager's office in Laois Traincare Depot; there were no restrictions found against ICR 16.

The Limited Shunter approached ICR 16 and removed the "Not To Be Moved" Board as there was no identification tag fitted. Initially the Limited Shunter made arrangement for ICR 16 to be hauled into the depot but when the air pressure built up sufficiently the Limited Shunter informed the CME Driver who agreed to drive the unit into the depot.

The CME Driver checked the Man Machine Interface screen and could see the brakes were isolated on both B-cars (intermediate cars); there was no indication of brake isolation on the two remaining A-cars (cars with driving cabs), and the CME Driver assumed it was safe to drive the train.

The CME Driver carried out a Static Brake Test and a Brake Functionality Test utilising the cab brake gauges, while the Limited Shunter carried out an external inspection of the train set. The Limited Shunter found a wheel chock stuck under a wheel and asked the CME Driver to move ICR 16 to allow the chock to be removed. The CME Driver moved ICR 16 and applied the brake, bringing ICR 16 to a stop.

The Limited Shunter entered the cab and advised the CME Driver that he would have to pull Points 6 in the yard, enroute to Road 15. The CME Driver applied power to ICR 16 and on approach to Points 6 he applied the brake and could feel no retardation i.e. ICR 16 did not slow down.

Both the CME Driver and the Limited Shunter made a number of attempts to slow down ICR 16 without success and ICR 16 struck the buffer stop on Road 14 at approximately 14 kilometres per hour. The CME Driver reported the accident immediately and the relevant parties were informed.

Wrongside Door Failure at Ashtown Station, 12th August 2018

On the 12th August 2018, the 19:43 hours (hrs) passenger service from Pearse to Maynooth was being operated by an eight-car 29000 Diesel Multiple Unit (DMU). At approximately 20:04 hrs while preparing to depart Ashtown Station the driver pressed the passenger doors close button on the driver's console when he saw that all passengers had disembarked and boarded the train.

The driver noticed that the blue Door Interlock Light (DIL) on the driver's console (light used for confirmation that the passenger doors are closed and locked) illuminated immediately while the platform side passenger door directly behind the driving cab was still in the process of closing; this is classified as a wrongside failure i.e. the blue DILs should only illuminate when the passenger doors have closed and locked. The wrongside door failures re-occurred on the return journey from Maynooth to Pearse, with the train being taken out of service at Connolly Station.

Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018

At approximately 08:47:03 hrs a Mayo County Council truck approached and drove onto Cartron Level Crossing, IÉ asset number XM220. At the same time, the 08:15 hours Ballina to North Wall Dublin goods train, Train K801, was approaching and travelled through the level crossing, striking the truck.

On impact the truck was thrown clear of the train and into the adjacent ditch before coming to a stop, the truck driver was dazed and subsequently left the scene with two colleagues before emergency services arrived and was later treated at Mayo General Hospital.

The driver of train was also conveyed to Mayo General Hospital from the scene by ambulance, he was treated for shock.

Full Investigations Published in 2018

1st January 2018 to 31st December 2018

The RAIU published one investigation report in 2018, which resulted in a total of seven new safety recommendations.

Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017

RAIU Report No: R2018 – 001 Published: 15th August 2018

On the 13th September 2017, the DART passenger service from Howth to Bray (Train E222) was delayed due to a loss of points detection at Points DL115, resulting in Signal DL31 being at danger.

Arrangements were made to have a Dun Laoghaire Station operative act as a Points Operator and clip and scotch Points DL115 in the normal position. The Points Operator did not carry out the instructions set out in the IÉ Rule Book, in full, leaving a gap between the switch rail toe and the stock rail. The Points Operator advised the Controlling Signalman that the route was set and the Controlling Signalman gave the driver of Train E222 permission to pass Signal DL31 at danger, over Points DL115.

At approximately 18:04 hrs the leading bogie of Train E222 derailed while crossing over Points DL115 before coming to a stop approximately 109 metres from Dun Laoghaire Platform 2. The driver of Train E222 immediately reported the accident to the Controlling Signalman who arranged signal protection to both the up and down lines.

Approximately sixty to seventy passengers carried out an uncontrolled impromptu evacuation from the train on to the permanent way before a controlled evacuation of the passengers was arranged by IÉ.

The immediate cause of the derailment was as a result of Train E222 travelling over failed Points DL115 which had been incorrectly secured by the Points Operator by leaving a gap between the stock and switch rails.

Contributory factors associated with the accident are:

- The Points Operator did not carry out the instructions set out in the IÉ Rule Book (Section B, Part 2, 10.0) and the General Appendix (Section E, 3), in full, for the hand operation of power operated points;
- The Points Operator and the Controlling Signalman did not adhere to the strict requirements for safety critical communications, in particular the repeating of messages, resulting in the Points Operator and Controlling Signalman not coming to a clear understanding of the situation.

The underlying causes associated with the accident were:

- Deficiencies in the training records, continuous assessment and performance records of points operators resulted in the Points Operator not having sufficient knowledge, competency or practical experience in order to carry out his duties;
- The derogation to extend workplace development events for the assessment of points operators from six months to twelve months resulted in the Points Operator not being re-assessed after being passed competent at the time of the accident.

A root cause associated with this accident is:

- Standard, IM-SMS-027, 'Derogation from Safety Management System' was drafted without following the principles of IM-SMS-014, 'Safety approval of changes in Plant, Equipment, Infrastructure and Operations (PEIO)' resulting in a derogation to standard IMO-SMS-031, 'Competence Management – Person required to conduct IM operating duties' being authorised without carrying out a risk assessment or involving all of the stakeholders to assess the effects of any changes.

The RAIU have made seven new safety recommendations, as follows:

- IÉ Infrastructure Manager (IM) should conduct a full review of IMO-SMS-031, 'Competence Management – Persons required to conduct IM operating duties' and associated documentation, to identify deficiencies in training, continuous assessment and the recording of performance of duties to ensure that persons carrying out these duties are competent to do so;
- IÉ IM and IÉ Railway Undertaking (RU) should evaluate the current training, assessment and monitoring of Safety Critical Communications to ensure that communications are carried out to the requirements set out in IÉ Rule Book, and safety critical communications standards IMO-SMS-033 and OPS-SMS-8.1;
- IÉ RU should review their suite of documents which reference major customer disruptions and emergencies, and address any deficiencies in relation to the management of passengers on trains and uncontrolled impromptu evacuations. These documents should then be briefed to staff who have roles in relation to customer disruptions and emergencies to ensure they are aware of their responsibilities;
- IÉ IM should update the relevant sections of the General Appendix and other associated documentation to specify where the points clip should be fitted;
- IÉ should agree and implement a consistent wording in the Rule Book, General Appendix, training material and oral instructions in relation to the points operator's instructions; and ensure that the importance of the task order is highlighted in the training for points operators;
- IÉ IM should review the drawing and specification requirements for points scotches and ensure only scotches manufactured to the required drawing and specification are made available to points operators;
- IÉ RU should brief the relevant staff on the requirements of the IÉ Rule Book (Section M 3.1.2) which states that where emergency detonator protection is not needed, drivers must place a Track Circuit Operating Device on the line(s) concerned to supplement the signal protection.

Urgent Safety Advice Notice issued in 2018

1st January 2018 to 31st December 2018

The RAIU issued one Urgent Safety Advice Notice (USAN) in 2018.

Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018

The RAIU commenced an investigation into the collision of an ICR with a buffer stop at Laois Train Care Depot, on the 17th July. The RAIU issued an USAN (USAN 002) on the 17th August 2018 as a result of early findings of the investigation. The USAN recommended that:

IÉ should advise all relevant staff that a positive brake cylinder gauge reading in the cab of an ICR is not an indication that a brake is present.

The CRR are tracking the status of the USAN through the safety recommendation process.

Tracking Safety Recommendations

RAIU

Railway Accident Investigation Unit

Tracking Safety Recommendations

Monitoring of RAIU safety recommendations

Under the Railway Safety Act 2005, the CRR[1] is responsible for monitoring the implementation of RAIU recommendations. All safety recommendations issued by RAIU are addressed to the CRR unless otherwise stated and the implementers are identified in the recommendation. The recommendations issued by the RAIU are reviewed by CRR for acceptability and where CRR accept the recommendations it monitors their implementation. The CRR also monitors the recommendations from USANs. The figure below identifies the three status codes assigned to recommendations by CRR 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 CRR 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 CRR. This status is assigned by CRR.
Complete	Implementer has taken measures to effect the recommendation and the CRR 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 CRR has received evidence of implementation that it will review to determine whether or not the recommendation is closed. This status is advised to CRR by the organisation or organisations responsible for implementing the recommendation.
Closed	Implementer has taken measures to effect the recommendation and the CRR has considered these and has closed the recommendation. Closed recommendations are those for which CRR is satisfied that the organisation responsible for implementing the recommendation has taken suitable action to address the recommendation. This status is assigned by CRR.

[1] Formerly the Railway Safety Commission (RSC); the name was changed on the 29th February 2016 under Statutory Instrument (S.I.) No. 69 of 2016, Change of name of the Railway Safety Commission to Commission for Railway Regulation (Appointed Day) Order 2016.

Status of RAIU safety recommendations

RAIU Safety Recommendations in numbers

The CRR, as the National Safety Authority (NSA) for Ireland, holds meetings with the relevant stakeholders to monitor the progress of safety recommendations.

As of the 31st December 2018, the RAIU have made 147 recommendations. All recommendations were accepted by their addressee and implementer. The status of the recommendations as of the end of 2018 was thirty-one open, four complete and 112 closed recommendations as illustrated below.

Year	Number of Reports	Number of Recommendations	Status of Recommendations		
			Open	Complete	Closed
2007	0	0	0	0	0
2008	1	7	0	0	7
2009	5	13	0	0	13
2010	6	26	1	0	25
2011	7	17	1	3	13
2012	3	13	1	0	12
2013	3	7	1	0	6
2014	6	27	4	1	22
2015	2	4	2	0	2
2016	3	17	9	0	8
2017	2	9	5	0	4
2018	1	7	7	0	0
Totals	39*	147	31	4	112

*Two other reports were published by the RAIU in 2010 & 2013 which did not warrant any safety recommendations.

The overall progress with the closure of recommendations in percentages is that: 76% of recommendations have been closed (compared with 69% in 2017); 3% have been completed (compared with 5% in 2017) and 21% remain open (compared with 26% in 2017).

Status of individual RAIU safety recommendations

In terms of the individual safety recommendations, the safety recommendations are compiled in the following tables:

Table	Recommendation Status	Comment
Table 1	Closed in 2018	Safety recommendations that were closed by the CRR in 2018.
Table 2	Complete in 2018	Safety recommendations completed as of the end of 2018.
Table 3	Open in 2018	Safety recommendations which remain open in 2018.
Table 4	Closed prior to 2018	Safety recommendations closed prior in 2017 or earlier.
Table 5	Status of USANs	Status of USANs.

Table 1 – RAIU safety recommendations closed in 2018

This section identifies the safety recommendations closed in 2018 (in order of occurrence date).

Report	Recommendation	Actions taken to close the recommendation
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.	IÉ reviewed and updated their Level Crossing Risk Management (LCRM) system.
	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.	Data available on the Information Asset Management System for the location of site access.
Car Strike at Murrough Level Crossing XG 173, 14th February 2011 (published 08/02/12)	IÉ should ensure that they adopt their own standards in relation to design changes to any PEIO that has the potential to affect safety.	The CRR have closed this recommendation in 2018.
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.	IÉ have updated traction manual and assessment documentation booklets for all required fleets.
Operating irregularity during Single Line Working (SLW) between Dundalk and Newry, 23rd March 2013 (published 28/04/14)	IÉ should review current communication procedures with regard to the updated communication equipment now available.	IÉ CTC have confirmed that a dedicated mobile phone (with international capabilities) exists for use by an appointed Pilotman at Dundalk Station.
Car strikes train at Level Crossing XM 250, Knockaphunta, Co. Mayo, 8th June 2014 (published 04/06/15)	The CRR, 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.	Task Force established between the CRR, RSA and IÉ to review relevant documents and develop a common policy. The work of the Task Force concluded in 2016 with the production of an updated Rules of the Road style booklet for the safe use of railway level crossings. This was jointly launched on International Level Crossing Awareness Day, 10th June 2016, by the Commissioner (CRR), the Director of IÉ-IM and the Managing Director of the RSA. Additionally a Joint Statement of Intent between the three parties was signed.
Summary of Investigation into SPADs on the IÉ network from January 2012 to July 2015 (published 11/04/2016)	IÉ-IM should review the Traffic Regulator's Manual with a view to introducing guidance for Traffic Regulator's in terms of the management of train delays and the switching of crossing points.	New Traffic Regulator's Manual has been published and briefed to relevant staff.
Dangerous occurrence between Ballybrophy and Portlaoise, 12th September 2015 (published 6th September 2016)	IÉ-IM should review the Site Safety Briefing procedure to ensure all personnel have made themselves aware of the information contained in the relevant Weekly Circular.	The Site Safety Briefing Book now includes a section requiring the inputting of the relevant Weekly Circular Number and a prompt requesting clarification of awareness of the relevant circular information.

Report	Recommendation	Actions taken to close the recommendation
Difflin Light Rail Passenger Fall, Co. Donegal 17th December 2016 (published 7th November 2017)	DLR should review their risk assessment process to ensure that all reasonably foreseeable risks associated with the operation of trains are identified and suitable control measures identified.	DLR have reviewed and updated risk assessments and incorporated into their SMS documentation.
	DLR should review the DLR SMS, in its totality, and ensure that there are internal monitoring procedures that mandates the periodic checking of application of SMS processes and practises.	DLE have updated their SMS documentation.
	DLR should review their responsibilities under the Safety and Welfare at Work Regulations as to dedicated First Aid areas.	Staff have been trained in first-aid and a dedicated first-aid room has been established.
Near miss at Knockcroghery Level Crossing, XM065, Co. Roscommon, 31st January 2017 (published 20th December 2017)	IÉ IM should review the human factors and non-technical skills training for LCCOs, and introduce further training, where applicable. In addition, IÉ RU should finalise the Professional Support Handbook for Level Crossing Control Operators; to provide guidance for LCCOs in the areas of human factors and non-technical skills.	IÉ-IM have introduced further human factors training for LCCOs and incorporated into the LCCOs Professional Support Handbook.

* Light blue indicates recommendations associated with IÉ & light pink indicates recommendation associated with Difflin Light Rail.

Table 2 – RAIU safety recommendations complete in 2018

This section identifies the safety recommendations completed, or that remain complete, as of the end of 2018.

Report	Recommendation	Status
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.	This recommendation remains complete in 2018.
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.	This recommendation remains complete in 2018.
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.	This recommendation remains complete in 2018.
Structural failure of a platform canopy at Kent Station, Cork, 18th December 2013 (Published 07/11/14)	IÉ IM should review the structural and annual inspection regimes for Building & Facilities to ensure all assets are inspected in accordance with the prescribed standards and any associated documentation is completed appropriately.	This recommendation remains complete in 2018.

* Light blue indicates recommendations associated with IÉ.

Table 3 – RAIU safety recommendations open in 2018

This section identifies the safety recommendations which remain open in 2018.

Report	Safety recommendation	Status
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 (published 16/08/10)	The CRR, 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, and 2001). This action plan should include defined timescales for the implementation and closure of all these recommendations.	This recommendation remains open in 2018.
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.	This recommendation remains open in 2018.
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.	This recommendation remains open in 2018.
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.	The status of this recommendation is open for IÉ-RU & closed for IÉ-IM in 2018. The RAIU have filed both under open.
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.	This recommendation remains open in 2018.
	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.	This recommendation remains open in 2018.
Operating irregularity during Single Line Working (SLW) between Dundalk and Newry, 23rd March 2013 (published 28/04/14).	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.	This recommendation remains open in 2018.
Structural failure of a platform canopy at Kent Station, 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.	This recommendation was placed as open in 2018.
Vehicle struck by train at Corraun level crossing, XX024, Co. Mayo, 12th February 2014 (published 30/04/15).	IÉ should consider options to upgrade the crossing to minimise direct action by the users.	This recommendation remains open in 2018.
	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.	This recommendation remains open in 2018.

Report	Safety recommendation	Status
Summary of Investigation into SPADs on the IÉ network from January 2012 to July 2015 (published 11/04/2016)	IÉ-IM must introduce an adequate train protection systems on all of the IÉ network for the protection of trains; this system should be robust and to an acceptable standard within Europe; and have the appropriate ATP and speed supervision functionality.	This recommendation remains open in 2018.
	IÉ-IM should review the functionality of the ATP's running release to ensure that the train protection function in relation to passing a signal at danger is appropriately maintained where drivers are approaching signals displaying red aspects. If this is not feasible with the current equipment it should be included any new train protection system introduced on the network.	This recommendation remains open in 2018.
	IÉ RU should review the culture within the company so that actions taken after SPAD's supports learning within the driver grades should errors occur, and that the DD&SS is used for redeveloping competence in driving skills and supporting the drivers in returning to driving duties, after a SPAD event.	This recommendation remains open in 2018.
	IÉ-IM should identify high risk signals and, where the technology exists, introduce a mechanism to monitor the approach speed to these signals; to ensure that near misses are identified and managed.	This recommendation remains open in 2018.
	IÉ-IM should review their training and competency management for Traffic Regulators so that they have the appropriate skill set in terms of identifying potential risks associated with the regulating of trains.	This recommendation remains open in 2018.
	IÉ-RU and IÉ-IM should carry out a review of the interfaces between different operational staff (i.e. drivers, LCCOs, signalmen and EOs) so that all operational staff can adequately manage train operations during degraded situations. Part of this review should focus on the safety critical communications between operational staff.	This recommendation remains open in 2018.
	IÉ-IM should identify all locations where safety critical communications are not recorded and develop a programme of works for the introduction of recording safety critical communications at these locations.	This recommendation remains open in 2018.
	IÉ-IM should review the procedures applicable to signalman, Level Crossing Keeper, LCCO and level crossing emergency operators with particular emphasis on the actions to be taken by each when a fault is detected at a level crossing. This review should consider circumstances where a train may already have entered the affected section of line, and circumstances where the signal may be missing or extinguished.	This recommendation remains open in 2018.
Dangerous occurrence between Ballybrophy and Portlaoise, 12th September 2015 (published 6th September 2016)	IÉ-IM should review the method of allocation and accountability for general operatives detailed for work sites, to ensure that there are sufficient personnel on site to perform the required duties.	This recommendation remains open in 2018.
Difflin Light Rail Passenger Fall, Co. Donegal 17th December 2016 (published 7th November 2017)	DLR should review the physical and procedural safeguards for the operation of their trains, to prevent small children whose feet do not touch the ground in a seated position, from falling from open carriages.	This recommendation remains open in 2018.
Near miss at Knockcroghery Level Crossing, XM065, Co. Roscommon, 31st January 2017 (published 20th December 2017)	The SET Department should review the camera position at LC XM065, and other similar CCTV level crossings, to ensure that the LCCOs have optimum, unobstructed, views of level crossings.	This recommendation remains open in 2018.
	The SET Department should develop a formalised risk assessment process for the positioning of CCTV cameras and associated design works.	This recommendation remains open in 2018.
	IÉ IM should identify CCTV level crossings with obstructed views and issue interim instructions to LCCOs to fully raise the barriers where there is a possibility of any obstructions on level crossings.	This recommendation remains open in 2018.
	IÉ IM should review and update the LCCC Instructions, to make them more user friendly for LCCOs.	This recommendation remains open in 2018.

Report	Safety recommendation	Status
Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017 (published 15th August 2018)	IÉ IM should conduct a full review of IMO-SMS-031, 'Competence Management – Persons required to conduct IM operating duties' and associated documentation, to identify deficiencies in training, continuous assessment and the recording of performance of duties to ensure that persons carrying out these duties are competent to do so.	This recommendation was made in 2018 and remains open.
	IÉ IM and IÉ RU should evaluate the current training, assessment and monitoring of Safety Critical Communications to ensure that communications are carried out to the requirements set out in IÉ Rule Book, and safety critical communications standards IMO-SMS-033 and OPS-SMS-8.1.	This recommendation was made in 2018 and remains open.
	IÉ RU should review their suite of documents which reference major customer disruptions and emergencies and address any deficiencies in relation to the management of passengers on trains and uncontrolled impromptu evacuations. These documents should then be briefed to staff who have roles in relation to customer disruptions and emergencies to ensure they are aware of their responsibilities.	This recommendation was made in 2018 and remains open.
	IÉ IM should update the relevant sections of the General Appendix and other associated documentation to specify where the points clip should be fitted.	This recommendation was made in 2018 and remains open.
	IÉ should agree and implement a consistent wording in the Rule Book, General Appendix, training material and oral instructions in relation to the points operator's instructions; and ensure that the importance of the task order is highlighted in the training for points operators.	This recommendation was made in 2018 and remains open.
	IÉ IM should review the drawing and specification requirements for points scotches and ensure only scotches manufactured to the required drawing and specification are made available to points operators.	This recommendation was made in 2018 and remains open.
	IÉ RU should brief the relevant staff on the requirements of the IÉ Rule Book (Section M 3.1.2) which states that where emergency detonator protection is not needed, drivers must place a Track Circuit Operating Device on the line(s) concerned to supplement the signal protection.	This recommendation was made in 2018 and remains open.

* light blue indicates recommendations associated with IÉ, dark blue Transdev (formally Veolia), lilac the CRR & light pink the DLR.

Table 4 – RAIU safety recommendations closed prior to 2018

This section identifies the safety recommendations closed prior to 2018:

Report	Safety Recommendation	Year Closed
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.	2015
	IÉ to develop a robust system that identifies current landowners who have crossings on their property and records the delivery of information to them. This should include the distribution of information to known contractors and should consider timely reminders coming up to the silage season.	2010
	IÉ to develop and implement a vegetation management programme that addresses vegetation management on a risk basis, prioritising high risk areas.	2015
	IÉ to ensure that a system is put in place for effective implementation of existing standards and manage the timely introduction of new and revised standards, this should include departmental instructions.	2014
	IÉ to review the standards relating to on-board data recorders, ensuring that correct operation, accuracy and post incident downloads are effectively addressed.	2010
	IÉ to review the "Monitoring the Speed of Trains" standard, including assessing the effectiveness of monitoring by means of signal cabin train registers.	2010
	The CRR to review and Issue 'Guidelines for the Design of Railway Infrastructure and Rolling Stock'.	2010
Report into the derailment of a Tara Mines freight train at Skerries, 10th January 2008 (published 06/04/09)	IÉ should put in place a risk based process to ensure ongoing review of the suitability of the temperature settings of the Hot Axle Box Detectors.	2010
	IÉ are to identify the necessary maintenance requirements for all Class D bearings, including producing detailed maintenance procedures taking into account their operational conditions and allowing for traceability of safety critical components, with assistance being sought from the Original Equipment Manufacturer where appropriate.	2010
Fatality at Level Crossing XX032 between Ballina and Manulla Junction, 28th February 2008 (published 02/03/09)	The CRR should carry out a review of the suitability of this type of level crossing on public roads. This review should include, but not be limited to. Factors such as continual misuse, signage, user mobility, environmental and human factors.	2013
	IÉ should, taking into account the close proximity of the three level crossings, close or upgrade some or all of these crossings.	2013
	IÉ must identify crossings that are regularly misused and take proactive action to manage the increased risk created by this misuse.	2015
	IÉ are to put in place procedures that will capture and manage near miss reports.	2010
Near miss at Ballymurray level crossing, 14th June 2008 between Athlone and Westport. (published 11/05/09)	IÉ should ensure all safety critical staff have undertaken safety critical communications training and that their ongoing competency management systems specifically monitors the quality of safety critical communications.	2010
	IÉ should put in place safe work methods for the maintenance of Automatic Half Barriers (AHBs), these methods should include risk assessments for any hazards identified in the maintenance of AHBs.	2010
Collision between a train and a road vehicle at level crossing XN125, Cappadine, on the Ballybrophy to Killonan line, 31st of July 2008 (published 29/07/09)	IÉ should assess the risks relating to road users' behaviour in identifying a safe stopping position at User Worked Level Crossings and based on the outcome of this risk assessment, IÉ should introduce measures to allow safe use of this type of level crossing.	2013
	IÉ should carry out risk assessments on level crossings that fail to meet the viewing distances specified in the CRR guidance and implement appropriate measures in order to meet this guidance as a minimum.	2013
Collision of a train with the gates of level crossing XH066, Bridgetown, on the Limerick Junction to Rosslare Strand line, 2nd December 2008. (published 01/12/09)	IÉ should review the training and competency management of gatekeepers and signalling maintenance personnel.	2010
	IÉ should review the design of signal indicators to ensure their design encourages correct interpretation.	2010
	The CRR should audit IÉ's training and competency management system to verify its effectiveness.	2010

Report	Safety Recommendations	Closed
Collision of a Locomotive with Passenger Carriages at Plunkett Station in Waterford on the Limerick to Rosslare Line, 29th March 2009. (published 04/03/10)	IÉ should review their systems for training and competency management of signalmen ensuring working as a relief signalman is taken into account.	2010
	IÉ should ensure procedures are put in place for the operation and maintenance of the MU-2-B1 valves.	2010
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.	2017
	IÉ should ensure On Track Machine maintenance personnel are trained and competent to examine the wheelsets.	2010
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 (published 16/08/10)	IÉ should put appropriate interface processes in place to ensure that when designated track patrolling staff (who report to two or more divisional areas) are absent from their patrolling duties, that appropriate relief track patrolling staff are assigned to perform these patrolling duties.	2011
	IÉ should amend the Track Patrolling Standard, I-PWY-1307, to remove the requirement for track patrollers to carry out annual checks for scour.	2010
	IÉ should formalise their "Civil Engineering and Earthworks Structures: Guidance Notes on Inspections Standard", I-STR-6515, which should include guidance for inspectors on conducting inspections and identifying structural defects. On formalising this document IÉ should re-issue, in the appropriate format, to all relevant personnel.	2010
	IÉ should introduce a verification process to ensure that all requirements of their Structural Inspections Standard, I-STR-6510, are carried out in full.	2013
	IÉ should 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.	2013
	IÉ should ensure that a programme of structural inspections is started immediately in accordance with their Standard for Structural Inspection, I-STR-6510, and ensure that adequate resources are available to undertake these inspections.	2010
	IÉ should carry out inspections for all bridges subject to the passage of water for their vulnerability to scour, and where possible identify the bridge foundations. A risk-based management system should then be adopted for the routine examination of these vulnerable structures.	2013
	IÉ should develop a documented risk-based approach for flood and scour risk to railway structures through: Monitoring of scour risk at sites through scour depth estimation, debris and hydraulic loading checks, and visual and underwater examination; Provision of physical scour / flood protection for structures at high risk; Imposing of line closures during periods of high water levels where effective physical protection is not in place.	2013
	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.	2015
	IÉ should introduce a training, assessment and competency management system in relation to the training of structural inspectors, which includes a mentoring scheme for engineers to gain the appropriate training and experience required to carry out inspections.	2012
	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.	2015
	IÉ should incorporate into their existing standards the requirement for the input of asset information into the technical database system upon completion of structural inspections.	2010
	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.	2015
	The CRR 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 CRR should also confirm that all previously closed recommendations satisfy this new process.	2016

Report	Safety Recommendations	Closed
Irregular operation of Automatic Half Barriers at Ferns Lock, County Kildare, on the Dublin to Sligo Line, 2nd September 2009 (published 26/08/10)	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.	2014
Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th November 2009 (published 15/11/10)	IÉ should review their vegetation management processes to ensure that vegetation covering substantial earthworks structures is adequately maintained to facilitate the monitoring and inspection of earthwork structures by patrol gangers and other inspection staff.	2013
	IÉ should review the effectiveness of their standards in relation to conducting earthworks inspections during periods of heavy rainfall, ensuring that earthworks vulnerable to failure are inspected during these periods by appropriately trained patrol gangers or inspectors.	2013
	IÉ should review their Standard for Track Patrolling, I-PWY-1307, for its effectiveness in identifying any third party activities that occur inside and outside the railway boundaries that could affect safety and where any deficiencies are found, IÉ should develop an alternative process for the identification of these third party activities.	2010
	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.	2015
	IÉ and the CRR 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.	2017
	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.	2015
Laois Traincare Depot Derailment, 20th January 2010 (published 19/01/11).	IÉ should ensure that the risks relating to use of spring assisted manual points are identified and that appropriate control measures are implemented based on the risks identified.	2013
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.	2017
	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.	2017
	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.	2016
Person struck at level crossing XE039, County Clare, 27th June 2010 (published 11/07/11)	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.	2017
Road vehicle struck at level crossing XM096, County Roscommon, 2nd September 2010 (published 04/10/11)	IÉ should put in place a formal process for identifying and communicating with known users of user worked Level Crossings.	2014
	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.	2017
	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.	2014
	IÉ should review its use of disused rail as fencing at user worked LCs to ensure it cannot potentially increase the severity of a collision and where this is the case, replace the disused rail with appropriate fencing.	2014

Report	Safety Recommendation	Closed
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.	2016
	The CRR should ensure that they adopt a formal approach to submissions made by IÉ in relation to design changes to any PEIO that has the potential to affect safety.	2012
Gate Strike at Buttevant Level Crossing (XC 219), County Cork, 2nd July 2011 (published 27/06/12)	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.	2017
	IÉ should review its risk management process for manned level crossings to ensure that risks are appropriately identified, assessed and managed to ensure that existing level crossing equipment is compliant with criteria set out in IÉ's signalling standards, where appropriate.	2013
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.	2017
	IÉ drivers (and other staff) should receive adequate training in the safe handling of fog signals.	2017
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.	2017
	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.	2016
	IÉ should audit their Level Crossing Risk Matrix (LCRM) system, to ensure it correctly identifies high risk level crossings; and identifies appropriate risk mitigation measures for individual level crossings.	2017
	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.	2017
Bearing failure on a train at Connolly Station, 18th October 2012 (published 26th September 2012).	IÉ should put in place provisions to assist train drivers with the task of identifying if there is a fault present with an axlebox.	2013
	IÉ should ensure the competency management system for signalmen includes the assessment of Hot Axle Box Detector (HABD) related functions they perform.	2014
	IÉ should put in place formal procedures governing the role of Fleet Technical Services staff in relation to Hot Axle Box Detectors.	2016
	IÉ should ensure that a robust system is put in place for the competency assessment of safety critical rolling stock maintenance staff.	2014
	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.	2014
Runaway locomotive at Portlaoise Loop, 29th November 2012 (published 19/09/13)	IÉ should review their Vehicle Maintenance Instructions (VMIs) for locomotives to ensure that there are adequate braking tests at appropriate intervals.	2016
	IÉ should adopt a quality control system, for the introduction of new maintenance procedures for locomotives.	2014
	IÉ should review their competency management system for train drivers to ensure that all driving tasks are routinely assessed.	2016
Trend Investigation: Possession incidents on the Iarnród Éireann network (published 27/01/14)	IÉ IM should develop a formal possession planning meeting framework that is consistent through the IÉ network.	2014
	IÉ IM 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.	2014
	IÉ IM 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.	2014
	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.	2017

Report	Safety Recommendation	Closed
Operating irregularity during SLW between Dundalk and Newry, 23rd March 2013 (published 28/04/14).	IÉ should review the signalling infrastructure cross -border with a view to commissioning the bi-directional signalling.	2014
DART wrongside door failure, Salthill & Monkstown Station, 10th August 2013 (published 30/07/14)	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.	2014
	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).	2015
	DART Operations (IÉ RU) should update the applicable EMU Drivers' Manuals 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.	2016
	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.	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 Vehicle Maintenance Contractor, review maintenance instructions to ensure separation is maintained between hydraulic circuit and the traction cables at installation and during operation.	2015
	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.	2015
	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.	2015
	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.	2017
	Transdev should ensure that Alstom, 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.	2015
	Transdev should ensure that Alstom, review their incident / accident investigation process to ensure that investigations are of sufficient depth and produce clear recommendations.	2015
Structural failure of a platform canopy at Kent Station, 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.	2015
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.	2015
	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.	2015
	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.	2016
	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.	2015
	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.	2015

Report	Safety Recommendation	Closed
Vehicle struck by train at Corraun level crossing, XX024, Co. Mayo, 12th February 2014 (published 30/04/15).	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.	2016
Summary of Investigation into SPADs on the IÉ network from January 2012 to July 2015 (published 11/04/2016)	IÉ-IM should review the functionality of signals in the Connolly area so that the instances of abnormal upgrades or downgrades.	2017
	IÉ-RU should commission an independent review, in terms of human factors, to determine why there is a prevalence for the occurrence of SPADs: at certain times of the day; at certain times of drivers shifts; and for drivers with three-five years driving experience.	2017
	IÉ-RU should introduce a near miss reporting system, whereby, drivers may report near misses without the fear of sanctions being imposed.	2017
	IÉ-IM, should review their procedures for the placement of speed boards and brief relevant staff to be vigilant in the placement of lineside signage with respect to the potential for obscuring of signals or otherwise unintentionally providing distractions to drivers, especially in the case where there are fixed colour light signals or they have potential to cause SOY SPADs.	2017
	IÉ-IM & IÉ-RU should review the current system of reporting SPAD events so that reports are consistent and published within a set period of time.	2016
Operational incidents at Ardrahan on the 23rd October 2015 & Spa on the 28th November 2015	IÉ-RU should review all traction fleets that do not have sanding capabilities, and fit suitable systems to minimise the risk of low adhesion incidents.	2017

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

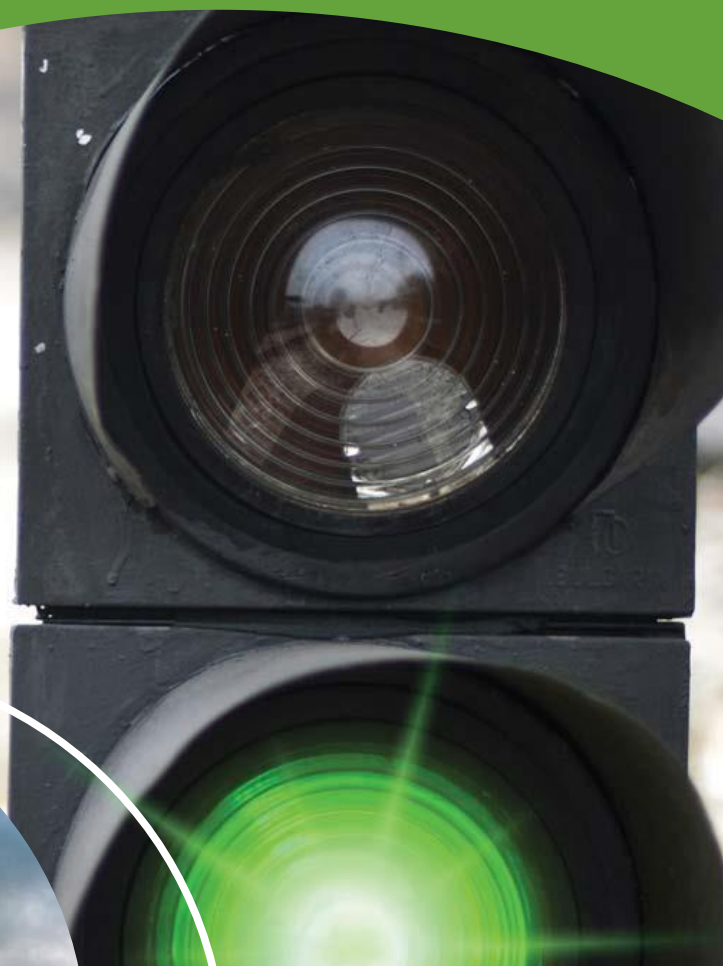
Table 5 – Status of RAIU USANs in 2018

This section identifies the status of recommendations from USANs.

Occurrence	USAN Details	Status
DART Wrongside Door Failure, Salthill & Monkstown Station, 18th August 2013	IÉ should put in place mitigation measures to prevent the wrong side failure of the door interlocking equipment on the Dart trains (USAN001a issued on the 19/08/2013).	Closed
	IÉ should put in place a system to manage the risks associated with the wrong side failure of the door interlocking equipment on the DART trains (USAN001b issued on the 19/08/2013).	Closed
Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018	IÉ should advise all relevant staff that a positive brake cylinder gauge reading in the cab of an ICR is not an indication that a brake is present (USAN002 issued on the 17/08/2018).	Open

* Light blue indicates recommendations associated with IÉ.

Appendices



Appendix 1 – 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;
- Nine heritage & minor railway systems (of which four are currently not operational).

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 CRR 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 CRR 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. Balfour Beatty Rail Ireland (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 & minor systems in 2017 included: Cavan & Leitrim Railway; Difflin Railway; Fintown Railway; Irish Steam Preservation Society; Lartigue Monorailway; Waterford and Suir Valley Railway;. Each of these acts as the RU and IM for their system.

Appendix 2 – 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 CRR, 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 CRR 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 organisation must carry out an investigation and produce a report within six months.

Appendix 3 – Abbreviations

CAWS	Continuous Automatic Warning System
CCE	Chief Civil Engineer
CME	Chief Mechanical Engineer
CRR	Commission of Railway Regulation
DART	Dublin Area Rapid Transit
DIL	Door Interlock Light
DLR	Difflin Light Rail
DMU	Diesel Multiple Unit
DTTAS	Department of Transport, Tourism & Sport
km/h	Kilometre per hour
EMU	Electrical Multiple Unit
EU	European Union
ICR	InterCity Railcar
HSA	Health & Safety Authority
IÉ	Iarnród Éireann
IM	Infrastructure Manager
LCCO	Level Crossing Control Operative
LTCD	Laois Train Car Depot
OHLE	Overhead Light Equipment
PEIO	Plant, Equipment, Infrastructure & Operations
PER	Preliminary Investigation Report
RAIU	Railway Accident Investigation Unit
RRV	Road Rail Vehicle
RU	Railway Undertaking
USAN	Urgent Advice Safety Notice

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