Railway Accident Investigation Unit

Ireland

Annual Report

2019

RAIU

Railway Accident Investigation Unit

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 2019, forty-three preliminary examination reports (PERs) were completed by the RAIU based on reports of incidents, accidents and serious accidents from Transdev (Luas), Iarnród Éireann Infrastructure Manager (IÉ-IM), IÉ Railway Undertaking (IÉ-RU) and Bord Na Móna. The reports included occurrences of: rolling stock faults; Road Rail Vehicle (RRV) occurrences; apparent self-harm occurrences; earthworks failures; energy faults; tram and heavy rail derailments in depots and sidings; cattle strikes; tram road traffic collisions; fire; buffer stop collisions; level crossing collision accidents; near-miss collision between a trains and an IÉ-IM staff member; and a passenger trap-and-drag incident on the Luas.

Of the forty-three PERs, two full investigations into individual incidents/accidents were commenced, namely:

- Passenger trap-and-drag occurrence on Luas tram at Heuston Stop, 26th March 2019;
- Near-miss collision between a train and an IÉ-IM staff member, at Rush and Lusk Station, 20th June 2019.

The RAIU published four investigation reports in 2019, namely:

- Wrongside Door Failure at Ashtown Station, 12th August 2018;
- Collision of an InterCity Railcar (ICR) with a buffer stop at Laois Train Care Depot (LTCD), 17th July 2018;
- Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018;
- Road Rail Vehicle (RRV) occurrences on Iarnród Éireann Network from 2015 to 2018.

Thirty-four safety recommendations were issued as a result of the four investigation reports; twenty of the safety recommendations related to the investigation into RRV occurrences. Two further recommendations were issued as a result of a Safety Advice Notice related to the collision of an ICR with a fixed buffer stop at LTCD on the 6th July 2019.

As of the end of 2019, the RAIU have issued a total of 187 safety recommendations from investigation reports, Urgent Safety Advice Notices (USAN) and one Safety Advice Notice (SAN), 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 187 RAIU safety recommendations issued to date: 119 have been closed out as having been addressed; further evidence has been requested by the CRR for seventeen recommendation; evidence has been submitted by railway organisations, to the CRR, in five instances; and, forty-six recommendations remain open or in progress.

David Murton
Chief Investigator

10th September 2020

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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 (full investigation or PER), if the RAIU make some early findings on safety issues that require immediate action, the RAIU will issue an USAN or SAN outlining the associated safety recommendation(s).

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 2019 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.

Investigation Activities

RAIU

Investigation Activities

Summary of Preliminary Examination Reports during 2019

1st January 2019 to 31st December 2019

The following outlines the forty-three PERs undertaken by the RAIU into occurrences on the railways in 2019. A PER is created upon the notification of an occurrence from a railway organisation, through immediate or monthly reporting.

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-IM	11 January 2019	Cork Station, Cork	Incident	Control-Command & Signalling	The 17:10 hours (hrs) empty rail car from Limerick to Cork Station (Train J258) was approaching Cork Station when the Signalman at Cork Cabin contacted the driver to inform him that he would be routing the train onto Platform 4 and then routing him to Platform 1. The train proceeded onto Platform 4. The Signalman then pulled the levers for 95 & 92 points instead of 95 & 90 points. Train J258 then proceeded onto Platform 2 where the 19:00 hrs Cork to Cobh train was standing. When the Signalman realised his mistake, he did not have time to make a call to the Driver to stop the train. The train came to a stop on Platform 2.	0
Transdev	17 January 2019	Junction C39, Abbey Street Lower, Dublin	Accident	To persons due to rolling stock in motion	A tram struck a female pedestrian who entered a tramway junction; she was knocked to the ground but was able to walk to an ambulance; she appears to have placed herself in a position of danger.	**1 Injury**
IÉ-IM	18 January 2019	North of Charleville Station, Cork	Serious Accident	To persons due to rolling stock in motion	The driver of the 19:25 hrs passenger service Cork to Heuston, (Train A229) contacted the Main Line Signalman Centralised Traffic Control (CTC) at 20:07 hrs to report that he felt a "bump" at 124 ¾ Mile Post (MP). The Main Line Signalman requested the driver of the 19:00 hrs Heuston to Cork (Train A226) to examine the line around the 124 ¾ MP. The driver of Train A226 reported back that there was a body on the line between the 124 ¾ MP and the 125 MP. An adult male had been fatally injured due to the impact, as a result of an apparent act of self-harm.	**1 Fatality** due to an apparent self-harm
IÉ-IM	25 January 2019	Hazelhatch, Dublin/ Kildare	Accident	Derailment	At 00:31 hrs the Signalman CTC noticed a loss of detection at points 802. He contacted the Person in Charge of Possession (PICOP) and found that an RRV had derailed at the points while hedge cutting was being undertaken, and the points had been damaged. The incident occurred out of sight of the PICOP and the Engineering Supervisor (ES) and the contractor had re-railed the RRV and not reported the incident.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ-IM	12 February 2019	Harmonstown, Dublin	Serious Accident	To persons due to rolling stock in motion	As the 11:35 hrs Dart Service from Bray to Howth approached Harmonstown Station an individual jumped off the platform into the path of the train in an act of apparent self-harm and was fatally injured.	**1 Fatality** due to apparent self-harm
Transdev	14 February 2019	Cookstown, Dublin	Serious Accident	To persons due to rolling stock in motion	At 09:56 hrs, a female crossed at a designated tram crossing, without looking for oncoming trams and was struck and fatality injured by a tram.	**1 Fatality**
Transdev	21 February 2019	Broombridge North Gate Depot, Dublin	Accident	Derailment	At 18:46 hrs, Tram 5032 was approaching the depot having finished its service from Sandyford; as the tram approached the signal before entering the depot it was displaying a single dot, the driver proceeded through the signal and consequently derailed the lead bogie as the points for the depot were not made to permit access.	0
IÉ-IM	9 March 2019	Clara, Offaly	Accident	To persons due to rolling stock in motion	At 15:12 hrs, a female was struck and seriously injured by the 13:10 hrs passenger service from Westport to Heuston Station, Dublin (Train A149) as it approached Clara Station. The female had apparently placed herself in a position of danger.	**1 Serious Injury** due to apparent attempted self-harm
Bord Na Móna	11 March 2019	Mostrim, Longford	Accident	Level Crossing	At approximately 07:30 hrs after the locomotive and brake wagons crossed Milkernagh Level Crossing on the Coole Mostrim Road a car collided with the level crossing gates that were closed to road traffic. The car driver stated that she was blinded by the sun at the time of the incident.	0
Transdev	11 March 2019	Kingswood, Dublin	Serious Accident	To persons due to rolling stock in motion	At 23:57 hrs a male was struck, and fatally injured, by a tram as it departed the Kingswood Stop outbound in the direction of Belgard Road. The male was in a segregated section of tramway and appears to have deliberately placed himself in a position of danger.	**1 Fatality** due to apparent self-harm
Transdev	13 March 2019	Jervis, Dublin	Accident	Collision	At 10:30 hrs Tram 3005 entered the Jervis Street junction outbound on a proceed signal. A car entered the junction breaching the red light and as a result, the car made contact with the left side of the tram and the railings on the corner of the footpath and junction. One passenger reported an injury and was taken, by ambulance, to hospital.	**1 Injury**
Transdev	16 March 2019	Benburb – Queen St Junction, Dublin	Accident	Collision	At 07:03 hrs, Tram 3003 was travelling inbound from Tallaght to the Point. At Queen Street junction the tram received a proceed signal and the tram entered the junction. A bus drove onto the tramway and collided with the side of the tram resulting in two bogies derailing. There were nine non-serious injuries which consisted of: four Luas passengers, three Transdev staff, Luas driver and bus driver.	**9 Injuries**

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	26 March 2019	Heuston Stop, Dublin	Incident	Others	At 14:22 hrs a male passenger attempted to board at inbound Luas (Tram 3011). The passenger placed his hand between the door leaf and pillar as the door was closing, trapping his hand. The tram began to move, and the passenger began walking along the platform with his hand trapped in the door. Security staff came to his assistance and his hand was freed.	0
IÉ-IM	1 April 2019	Newbridge, Kildare	Accident	To persons due to rolling stock in motion	At 12:30 hrs, the 10:25 hrs Cork to Heuston passenger service (Train A211) approached Newbridge Station and struck a person, that was lying down in the five foot. The person suffered non-life-threatening injuries.	**1 Injury** due to apparent attempted self-harm
IÉ-IM	9 April 2019	Bray Head, Wicklow	Serious Accident	To persons due to rolling stock in motion	At 11:40 hrs the driver of the 10:30 hrs Malahide to Greystones DART service (Train E110) reported that he ran over a body that was on the line. The occurrence took place on the Down line between tunnel 2 and 3 along Bray Head. It appears the person was trespassing and fell from the tunnel structure and was fatally injured prior to being struck by the train.	**1 Fatality** due to trespass
IÉ-RU	28 May 2019	Limerick Station, Limerick	Accident	Collision	At 23:06 hrs, two empty ICR units were damaged during an attempted coupling on Platform 3 as the couplers had not been extended prior to the coupling movement resulting in a collision between the two ICRs.	0
Transdev	7 June 2019	Citywest & Red Cow Junction, Dublin	Accident	Collision	At approximately 13:00 hrs, Tram 3016 had a procced signal to travel through the junction of Citywest and Red Cow. On travelling through the junction, a car proceeded on a red light and collided with the tram.	0
IÉ-RU	14 June 2019	Laois Train Care Depot (LTCD), Laois	Accident	Derailment	At 20:14 hrs a four-piece ICR was exiting Road 10 to travel to the Head Shunt. Three of the four coaches passed the derailer without incident when the limited shunter raised the derailers as the train was travelling over them. The derailers fully deployed before the rear bogie had reached them causing the rear bogie to derail.	0
IÉ-IM	16 June 2019	Sixmilebridge, Clare	Accident	Collision	The 08:25 hrs passenger service from Limerick to Heuston struck and killed eleven weanling cattle near Sixmilebridge Limerick/Ennis section, damaging the train.	0
IÉ-IM	17 June 2019	Kildangan, Kildare	Accident	Level Crossing	The 07:50 hrs passenger service from Waterford to Heuston struck a quad bike that was stationary on a farmer's crossing type level crossing between Athy and Cherryville Junction, on the Waterford to Dublin line. The biker left the scene after the accident.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
IÉ-IM	20 June 2019	Rush & Lusk Station, Dublin	Incident	Others	At 09:50 hrs an IÉ staff member was on the railway line between the platforms of Rush & Lusk Station, when the 08:00 hrs Belfast to Connolly passenger service (Train A123) approached on the Up line. The IÉ staff member moved onto the Down line; then the 09:29 hrs Pearse to Drogheda empty service (Train C802) approached and almost struck the IÉ staff member who just cleared the railway line prior to the arrival of the train.	0
IÉ-IM	4 July 2019	Cork Station Yard, Cork	Accident	Derailment	At 02:10 hrs an RRV dumper derailed at Trap Points 536b in Cork Station Yard during a possession. An instruction was relayed to the RRV Dumper to be on-tracked and not to move until further instruction. However, following the on-tracking of the RRV there appeared to have been a misunderstanding and the RRV proceeded (towards the worksite) over the trap points which were not set for the movement and it subsequently derailed. No injuries reported and minimal damage to infrastructure.	0
IÉ-RU	6 July 2019	LTCD, Laois	Accident	Collision	At 15:06 hrs Chief Mechanical Engineer's (CME) Department Craft Worker was undertaken maintenance on an ICR 16 on Pit Road 8, inside the shed at LTCD. ICR 16 was in a normal state with no bypasses or isolations activated or circuit breakers tripped when it moved approximately 8.25 meters under its own power before colliding with the road end buffer. The train rode up on, and moved, the buffer before coming to a stop; the buffer was significantly damaged. No other persons were in the vicinity of the train at the time of the occurrence; no one was injured.	0
IÉ-IM	8 July 2019	Heuston Station, Dublin	Accident	Fire	At 17:47 hrs as ICR set 48 was approaching Heuston Station, the driver received a general warning. The train was travelling at approximately 20 mph; shortly afterwards the fire suppression system operated. The driver brought the train to a stop on Platform 4, away from the canopy. Passengers disembarked without issue. IÉ staff attempted to extinguish the fire from the underframe of ICR 22248; the fire brigade attended, and the fire was extinguished. An investigation of the power pack identified a low-pressure pipe leak on the inlet to the fuel filter.	0
IÉ	12 July 2019	Laytown, Meath	Serious Accident	To persons due to rolling stock in motion	At 19:35 hrs the 19:00 hrs passenger service from Dublin to Belfast (Train A134) struck, and fatality injured, a female on the track at Laytown Station as she was crossing the line with another individual.	**1 Fatality** due to trespass

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	15 July 2019	Dawson Street, Dublin	Accident	To persons due to rolling stock in motion	At 12:03 hrs Tram 5001 was travelling southbound on Dawson Street when a pedestrian ran across the tramway from behind a Northbound tram. The pedestrian made contact with the side of the cab and was pushed away from the tram and knocked to the ground. The tram driver applied the Emergency brake to stop the tram. The pedestrian got back up and was helped to the footpath by a member of the public. The person received injuries to the hip and face and was bought to hospital, by ambulance.	**1 Injury**
Transdev	19 July 2019	Steeven's Lane, Dublin	Accident	To persons due to rolling stock in motion	At 13:51 hrs, as Tram 3016 passed the entrance of St. Patrick's Hospital, a male adult deliberately steps off the footpath and into the pathway of the tram and was struck by the tram. He suffered non-life-threatening injuries and was taken, by ambulance, to St. James' Hospital.	**1 Injury** due to an apparent self-harm
Transdev	9 August 2019	Cookstown, Dublin	Accident	Collision	At 15:45 hrs, Tram 4004, had a proceed signal to enter junction A03 Cookstown Way; as the tram was passing through the junction; a car breached a red light and travelled onto the junction and collided with the front of the tram; resulting in the car spinning and colliding with two stationary cars. The driver of the car was taken, by ambulance, to hospital with non-life-threatening injuries. The tram driver was taken to hospital for observation.	**2 Injuries**
IÉ-IM	15 August 2019	Inchicore Saw Mill Siding, Dublin	Accident	Derailment	At approximately 10:30 hrs an RRV shunting machine was operating as part of training exercise when the rear rail wheels derailed.	0
IÉ-IM & IÉ-RU	16 August 2019	Bray Station, Wicklow	Accident	Derailment	At 17:48 hrs, an empty Electric Multiple Unit (EMU) derailed at Points 117 when travelling from the Up Main Line to the Down Main Line. The leading bogie of the lead car derailed with all four wheels off. All other bogies remained on the rails and the train remained upright.	0
IÉ-RU	4 September 2019	Heuston Station, Dublin	Accident	Others	At 10:20hrs while operating the 09:48 hrs Grand Canal Dock to Hazelhatch service the driver heard a loud bang from the vicinity of the battery box on ICR car 22409. On examination the skirt door and battery box doors were blown off and the batteries were found to be hot and distorted.	0
IÉ-IM	21 October 2019	Nenagh Station, Tipperary	Accident	Derailment	At 14:05 hrs an RRV derailed at ground frame points 3A/3B while working in a possession. The RRV was moving from the siding to the main line when it derailed.	0
IÉ-RU	22 October 2019	Drogheda, Louth	Incident	Rolling Stock	At 08:24 hrs, a wrongside door failure was reported on a De Dietrich train, the 06:45 hrs Belfast to Connolly passenger service. It was found that the driver had not followed the correct procedure and pressed both the left and right enable buttons resulting in the offside door opening.	0

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	22 October 2019	Citywest-Cheeverstown Dublin	Accident	To persons due to rolling stock in motion	At 21:58 hrs a pedestrian was walking in a segregated section of track when struck by Tram 4005. The pedestrian was taken to hospital by ambulance.	**1 Injury** due to trespass
IÉ-IM / Rhomberg Sersa	24 October 2019	Wexford Quay, Wexford	Accident	Collision	At 14:15 hrs a Track Recording Vehicle (TRV), operated by Rhomberg Sersa, was travelling at 5 miles per hour along Wexford Quay when it struck a car at crossing point XR161C. There was no damage to TRV.	0
IÉ-IM	28 October 2019	Clarke Station, Dundalk, Louth	Accident	Fire	At 09:26 hrs the Station Controller noticed smoke coming from above the 09:30 hrs passenger service from Dundalk to Connolly (Train P704) which was stationary on Platform 3. The Station Controller and Driver evacuated the train which had seven passengers on board and moved them to a place of safety. The train exhaust outlet was positioned below roof trusses which contained dried bird nests, which ignited from the heat. There was some damage to the footbridge.	0
Transdev	31 October 2019	Parnell Street, Dublin	Accident	To persons due to rolling stock in motion	As Tram 5025 departed Parnell Street Stop a pedestrian stepped into the pathway of the tram and was struck and suffered minor injuries. The pedestrian and the tram driver were conveyed to hospital as a pre-cautionary measure.	**2 Injuries**
IÉ-IM	3 November 2019	Bray Tunnel 1, Wicklow	Accident	Collision	At approximately 07:00 hrs an RRV jeep, travelling in the reverse direction collided with an RRV excavator, breaking the windscreen of the RRV jeep. The RRV Controller (travelling in the RRV jeep) was taken to hospital with minor injuries.	**1 Injury**
Transdev	19 November 2019	Cookstown	Accident	To persons due to rolling stock in motion	At 10:45 hrs, as Tram 3009 departed outbound a pedestrian had a seizure and fell against the moving tram. Tram 3014, travelling inbound, saw the pedestrian and contacted the driver of Tram 3009 to tell him to stop the tram. The driver of Tram 3009 applied the emergency brake and stopped the tram. The pedestrian was taken to hospital. A passenger on the tram was also taken to hospital with reported injuries.	**2 Injuries**
Transdev	25 November 2019	Suir Road, Dublin	Accident	Collision	Tram 3014 departed Suir Road Stop on a proceed signal, heading inbound, when a van came from the right-hand direction and made contact with the right-hand side of the tram damaging the front and side windscreens and front fairing. The van had driven through a red light. One passenger injury reported.	**1 Injury**

Railway Body	Date of occurrence	Location of occurrence	Classification of occurrence	Classification subset	Summary	Fatalities/ Injuries
Transdev	15 December 2019	Charlemont Ramp, Dublin	Serious Accident	To persons due to rolling stock in motion	At 03:03 hrs, Tram 5001 was travelling at 16 km/h on the approach ramp to Charlemont Stop (which is segregated tramway) when the tram driver saw a bicycle and person stationary on the line. The driver applied the emergency brake. Emergency services arrived at the scene and the cyclist was pronounced dead.	**1 Fatality** due to trespass
IÉ-RU	19 December 2019	Booterstown, Dublin	Accident	To persons due to rolling stock in motion	The 15:00 DART service from Howth to Greystones (Train E119) was operating as normal when it arrived at Booterstown southbound platform. At Booterstown, an intending passenger on the northbound platform got down on the tracks and began to cross the railway towards the southbound platform when he was struck by Train E119 departing Booterstown Station. The person struck was conscious and was attended to by emergency services.	**1 Injury** due to trespass
Transdev	19 December 2019	Suir Road, Dublin	Accident	To persons due to rolling stock in motion	At 17:22 hrs Tram 3002 received a proceed signal to depart Suir Road Stop and began travelling through the Suir Road junction when a woman walked into the side of the tram. She was assisted by other parties at the scene to a seat and a car came and collected her, whereby she left the scene of the accident.	**1 injury**

It should be noted, in February 2020, the RAIU became aware of a near-miss incident between a train and an IÉ-IM Patrol Ganger on the 4th June 2019, near Woodlawn, Galway which was not reported to the RAIU, either through immediate or monthly reporting. In February 2020, the RAIU commenced an investigation into this incident, on completion of a PER.

Compilation of Preliminary Examination Reports during 2019

1st January 2019 to 31st December 2019

The following is a compilation of the categories of PERs for 2019.

Serious Accidents and accidents to persons due to rolling stock in motion

In general, the RAIU do not conduct a full investigation into occurrences related to apparent self-harm or trespass occurrences, as a full investigation is not likely to result in any safety recommendations to prevent similar occurrences in the future. The break-down of these types of occurrences on the IÉ and Luas network is as follows:

- IÉ – Two fatalities as a result of apparent self-harm;
- IÉ – Two injuries as a result of apparent self-harm;
- IÉ – Two fatalities as a result of trespassing;
- IÉ – One injury as a result of trespassing;
- Transdev – One fatality as a result of apparent self-harm;
- Transdev – Two injuries as a result of apparent self-harm;
- Transdev – One fatality as a result of trespassing;
- Transdev – One injury as a result of trespassing.

Other occurrences related to persons, due to rolling stock in motion, include:

- Transdev – One fatality as a result of a person not looking for oncoming trams at a designated crossing;
- Transdev – Three injuries as a result of persons not looking for oncoming trams before crossing the tramway;
- Transdev – One injury as a result of a person having a seizure adjacent to a moving tram.

Accidents & incidents on the IÉ network:

Excluding the above, the compilation of accidents for IÉ-IM and IÉ-RU in 2019:

- Five RRV accidents – four derailments & one collision (IÉ-IM);
- Two derailments in depots/yards (IÉ-IM & IÉ-RU)
- One fire at a station (IÉ-IM)
- One explosion of a battery box on a train (IÉ-RU);
- One mainline derailment (IÉ-IM / IÉ-RU);
- One collision with cattle (IÉ-IM);
- One collision between two trains during coupling (IÉ-RU);
- One collision with a buffer in depot (IÉ-RU);
- One collision between a train and a quadbike at a level crossing (IÉ-IM);
- One collision between a TRV and a car (IÉ-IM).

Compilations of incidents for IÉ-IM and IÉ-RU in 2019:

- One command-control and signalling incident involving the wrong routing of train (IÉ-IM);
- One near-miss between a train and a Signalling, Electrical and Telecommunications (SET) staff member (IÉ-IM);
- One incorrect door opening procedure occurrence (IÉ-RU).

Accidents & incidents on the Luas network

Compilation of accidents for Transdev in 2019:

- Five collisions with road vehicles resulting in a total of thirteen injuries;
- One derailment in a depot.

There was also one drag-and-drag incident involving a passenger being dragged alongside a tram after his hand became trapped in a tram door.

Accident on the Bord na Móna network

There was one reported level crossing accident involving a car colliding with level crossing gates.

Summary of Full Investigations commenced in 2019

1st January 2019 to 31st December 2019

Two full investigations into reported occurrences were commenced in 2019:

- Passenger trap-and-drag occurrence on Luas tram at Heuston Stop, 26th March 2019;
- Near-miss collision between a train and an IÉ-IM staff member, at Rush and Lusk Station, 20th June 2019.

Passenger trap-and-drag occurrence on Luas tram at Heuston Stop, 26th March 2019

On the 26th March 2019, at approximately 14:22 hrs, a male passenger attempted to board inbound Luas tram, Tram 3011, at Heuston Stop. The passenger placed his hand between the door leaf and the door pillar of the rear most entrance door as the door was closing. The passenger's hand became trapped in the door seals. The door obstacle detection system did not detect the presence of the hand as it was less than 10 millimetres (mm); the door operation mechanism allows 10 mm obstacle detection to facilitate door closing.

The tram departed Heuston Stop nineteen seconds after the doors were closed with the passenger's hand trapped in the door. Two security staff came to the passenger's assistance, with one of the security staff communicating with the driver by radio.

The tram began to move, with the passenger's hand still trapped and the passenger walked along the platform with his hand trapped in the door seal for five seconds before the security staff assisted in freeing the passenger's hand from the door. The tram came to a stop four seconds after the passenger had freed his hand.

Near-miss collision between a train and an IÉ-IM staff member, at Rush and Lusk Station, 20th June 2019

At approximately 09:50:31 hrs, on the 20th June 2019, a member of IÉ-IM's SET Department's staff (to be referred to as SET Worker) accessed the railway line at Rusk and Lusk Station and began walking on the railway line (Up Line). The SET Worker was accessing the railway line to inspect electrical equipment associated with a nearby SET location case.

Seven seconds later the SET Worker sees the 08:00 hrs Belfast to Connolly passenger train approaching on the Up Line and starts to walk towards the other railway line (not occupied by the train, the Down Line). At 09:50:42 hrs, while standing in the middle of the Down Line, he raises his hand above his head to acknowledge the presence of the train, he is not in a position of safety. Two seconds later (09:50:44 hrs) the SET Worker walks across to the Down Platform and leans his elbow down on the platform and raises his other hand to acknowledge the train for a second time, he is not in a position of safety.

As the SET Worker watches the Belfast to Connolly train pass (09:50:46 hrs), the SET Worker sees the 09:29 hrs Pearse to Drogheda passenger train approaching on the Down Line. The SET Worker walks, at pace, towards the ramp of the Platform and begins to climb up on the ramp of the Down Line Platform, he stumbles during the climb. At 09:50:53 hrs the SET Worker clears the track, although he is not in a position of safety. One second later, at 09:50:54 hrs, the train travels past the SET Worker. At 09:50:56, the SET Worker is more than 1.5 metres from the track, in a position of safety; he does not suffer any injuries as a result of the incident.

Full Investigations Published in 2019

1st January 2019 to 31st December 2019

The RAIU published four investigation reports in 2019, which resulted in a total of seven new safety recommendations.

Wrongside Door Failure at Ashtown Station, 12th August 2018

RAIU Report No: R2019 – 001 Published: 25th June 2019

On the 12th August 2018, the 19:43 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.

The immediate cause of the wrongside door failure was as a result of unwanted contact of the Door Interlock Loop crimp with the battery positive spade, resulting in the Door Interlock Loop circuit completing, when a door was opened by a passenger on the front set and the doors of the rear set remained closed. Contributory factors associated with the incident were:

- The detachment of Crimps 38 and 39 from their associated spades;
- The lack of insulation beyond the crimp spade head.

Underlying cause associated with the incident was:

- Vehicle Maintenance Instruction (VMI) Z1C29A0001 did not require a thorough examination of all parts of the autocoupler after the collision on the 6th June 2018, despite the examination identifying damage to the exterior of the autocoupler;
- Scheduled maintenance did not detect that Crimps 38 and 39 had detached from their associated spades.

A root causes associated with the incident was:

- CME-SMS-006, Hazards & Risk Assessments, was not robust in identifying the risks associated with lack of insulation on the crimp and the risks of not carrying out a thorough examination of all parts of the autocoupler after an accident.

The following additional observations were made by the RAIU:

- The Traffic Regulators' Manual does not include a procedure for dealing with wrongside rolling stock failures;
- The Traffic Regulators' Manual does not list the immediate or monthly bulk occurrences to be notified to the RAIU;
- Voice communications between CME Maintenance Department (Drogheda) and the Driver were not recorded as required in the Traffic Regulators' Manual.

As a result of the investigation, the RAIU made the following safety recommendations:

- IÉ-RU CME should review VMI Z1C29A0001 'Examination of 29000 class vehicle after an incident / accident to develop a more thorough and robust VMI that is commensurate with the safety risk of faults occurring after rolling stock has been involved in an incident or accident;
- IÉ-RU CME should review VMIs associated with the examination of rolling stock after an incident / accident, for all rolling stock fleets, to develop a more thorough and robust VMI that is commensurate with the safety risk of faults occurring after rolling stock has been involved in an incident or accident;
- IÉ-RU CME should review their scheduled maintenance examinations, for multiple-unit fleets, with a view to developing a means to check the connection is correct on the electrical head;
- IÉ-IM should re-brief Traffic Regulators on the importance of adhering to the Traffic Regulators' Manual in relation to the recording of all telephone conversations within the controlled environment.

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

RAIU Report No: R2019 – 002 Published: 25th June 2019

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

The 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 LTCD; 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 (MMI) 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 Number 6 (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 (km/h). The CME Driver reported the accident immediately and the relevant parties were informed.

The immediate cause of ICR 16 colliding with the buffer stop at LTCD was as a result of ICR 16 bee driven with no operational brake on the train.

Contributory factors associated with the accident are:

- Circuit breaker General Warning Circuit Breaker was in the tripped position on both A-cars resulting in no notification of the brake isolation being shown on the cab MMI;
- The brakes on all four cars of ICR 16 were isolated (leaving ICR 16 unbraked) with no adequate process in place to communication this to staff at LTCD;
- The ICR Hauling Assisting Instructions were not complied with for the previous movement of the vehicle resulting in ICR 16 being stabled with the brakes isolated;
- The ICR cab brake cylinder gauge is upstream of the brake isolating cocks allowing for a positive brake cylinder reading even when the brakes are isolated;
- It is possible to achieve all the correct readings when the Brake Functionality Test and Static Brake Test are completed and still have no brake on an ICR train set.

The underlying cause associated with this accident:

- The formal and informal processes in place for: the use of Not To Be Moved Boards; the labelling of defective vehicles; and the communication of train statuses, was not sufficient in notifying the staff at LTCD of the issues with ICR 16;
- The suite of LTCD documentation does not refer to the ICR Hauling Assisting Instructions which would have ensured that ICR 16 was sufficiently braked while stabled.

As a result of the accident, the RAIU made four safety recommendations:

- IÉ-RU CME should review their Portlaoise Train Depot Safe System of Work & Operating Instructions (SSOW & OI) and associated documents related to the identification, communication and prevention of movement of defective vehicles to ensure relevant staff are made aware of identified defects and that the defective vehicles are adequately labelled and tagged; and these processes and staff responsibilities are fully understood by all CME staff working on trains;
- IÉ-RU CME should review the suite of LTCD documents that relate to the management of moving trains within LTCD to ensure they are consistent and adequately reference any existing supporting documentation (e.g. ICR Hauling Assisting Instructions);
- IÉ-RU CME should review its training and competency of CME Drivers and Limited Shunters ensuring the stabling and movement of vehicles (defective or otherwise) are adequately addressed;
- IÉ-RU CME should expand the requirements of preparation instructions for rail vehicles to ensure that on completion of these tests the brake status of a train can be fully established; this should include checking the status of circuit breakers and brake isolations.

In addition, the RAIU made three safety recommendations based on additional observations:

- IÉ-RU CME should re-brief staff on the correct procedure for disembarking from a moving train;
- IÉ-RU CME should develop a formal procedure for the examination of vehicles prior to moving a train which has been left unattended with no direct handover;
- IÉ-RU CME should determine who has overall responsibilities for the movement of trains within the confines of LTCD, including who is allocated the role of Designated Person Responsible for Protection, and, clearly brief these responsibilities in the CME Training Course and the SSOW & OI.

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

RAIU Report No: R2019 – 003 Published: 3rd September 2019

At 08:47:03 hrs a Mayo County Council truck (Truck) approached and drove onto Cartron Level Crossing, IÉ-IM asset number XM220 (LC XM220) and drove onto the Level Crossing. At the same time, the 08:15hrs 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.

The immediate cause of the accident was that the Truck Driver did not stop at LC XM220 to look for approaching trains, as required; but instead drove onto LC XM220, into the path of the oncoming train. Contributory factors associated with the accident are:

- The gates at LC XM220 were left open by the previous user (which was normal at this level crossing), allowing the truck to drive onto the track without stopping to look for approaching trains;
- The Truck Driver may have been distracted due to the driving manoeuvre and works he was about to undertake and the weather conditions at the time;
- On the approach to LC XM220, the Truck Driver was not thinking about approaching trains; the traffic calming measures on site (such as the advance warning signs) may not be adequate at communicating to the users that they are approaching a railway line.

The underlying causes associated with this accident are:

- IÉ-IM have not taken sufficient actions at LC XM220 to prevent its regular misuse.

The RAIU made one additional observation related to this accident:

- Mayo County Council's Driver's Handbook does not identify the risk associated with user operated level crossings.

The RAIU made three safety recommendations as a result of this accident:

- IÉ-IM should consider options to upgrade LC XM220 to minimise the requirement of direct action by the users;
- IÉ-IM should carry out a full review of known misused user worked level crossings on public and private roads and should develop a programme to either close or upgrade the level crossings to minimise misuse; where possible, level crossings with the highest risks should be addressed first;
- DTTAS should review, in consultation with the relevant stakeholders, their current advance warning signage (W 121) with a view changing the signage to make it clear to road users that they are approaching a user operated level crossing. They should also consider the introduction of other traffic calming measures in efforts to encourage safe road user behaviour. Care should be taken not to inadvertently introduce new risks as a result of their proposed measures.

Road Rail Vehicle occurrences on Iarnród Éireann Network from 2015 to 2018

RAIU Report No: R2019 – 004 Published: 8th October 2019

Introduction

In March, April and June 2018 the RAIU received reports, from IÉ-IM, of three collisions between two Road Rail Vehicles (RRVs) operation in convoy; prior to 2018, the RAIU had never received a notification of an RRV incident or accident. After a preliminary examination of the three accidents, the RAIU made the decision to review all reported RRV incidents/ accidents from 2015 to 2018 to establish if there was an apparent trend in the causation of these incidents /accidents. In total sixteen occurrences involving RRVs were included in the trend investigation. The occurrences were divided into three main categories:

- Loss of control of RRV – resulting in RRVs collisions with other RRVs;
- Collisions – RRV collisions with infrastructure, on-track machinery (OTM) and rolling stock;
- Points run-through by RRV – resulting to damage to points (and in one case derailment).

Immediate causes, contributory factors, underlying causes and root causes

The main immediate causes to these occurrences was as a result of the RRV Operators (RRVOs) losing control over the operation of the RRVs or losing situation awareness of their surroundings (e.g. due to focusing on other work tasks); or, RRVOs and RRV Controllers (RRVCs) not checking the positioning of the points before travelling over them. The main contributory factors to these occurrences were:

- RRVOs not allowing adequate time (e.g. speeding) or maintaining sufficient distances between RRVs when operating in convoy;
- RRVOs not controlling the movements of their RRVs in such a way to manage external conditions, such as weather, rail contamination, track gradients; or, not being able to manage RRVs in an emergency situation;
- RRVOs not requesting, following or waiting for instructions from the RRVC; or the RRVC was not effective in providing instructions for the control of movements for the RRVs;
- RRVOs not maintaining situational awareness in terms of the positioning and movements of the other RRVs; or, the presence of other assets (overhead line equipment (OHLE) or rail vehicles);
- RRVOs do not have a clear understanding on the railway infrastructure i.e. they could not differentiate the position of the points when either in normal or reverse positions;
- Lack of supervision from IÉ-IM (through RRVCs) in that there were no RRVCs present during RRV movements or there were not enough RRVCs on site where there are multiple RRVs operating in convoy;
- RRVCs have not requested the correct positioning of points, from the signalman, before requesting the RRVO to travel over the points;
- There is some doubt as to the suitably of the RRVs in their current state, in particular, in terms of braking performance;
- Signalmen did not set the points for the route requested in some instances.

Underlying causes were identified as:

- Inadequate training requirements of RRVOs/RRVCs, as set out in IÉ-IM CCE Plant and Machinery Standard (I-PLM-5001), in the operation of the RRVs;
- Inadequate training of RRVOs in relation to infrastructure on the railway network (e.g. OHLE) and in relation to the operation of RRVs on the railway network (e.g. confined spaces);
- There is some doubt as to the requirements, inspection and maintenance of RRV plant, as set out in I-PLM-5001; in particular, the braking performance in an emergency situation.

Root cause were identified as:

- Section Q of the IÉ-IM Rule Book is not robust in terms of the operation of RRVs in convoy, in particular in terms of the presence and allocation of RRVCs;
- I-PLM-5001 is not effective in terms of the requirement criteria for:
    - Inspection, maintenance and management of plant on site;
    - Training of RRVOs/RRVCs;
    - RRVs operating in confined/ restricted spaces (e.g. height limiters on RRVs).

Other important findings by the RAIU

The RAIU made a number of significant findings in relation to:

- The classification of RRVs and the consequences of the classification;
- The fact that IÉ-IM were not using current European Standards in relation to the design requirements for RRVs.

Safety recommendations

As a result of the RAIU investigation, the RAIU made twenty new safety recommendations:

- The DTTAS should review the Railway Safety Act 2005 and current amendments to make clear the classification of RRVs; consultation should be sought with the Commission for Railway Regulation (CRR); and, relevant stakeholders where appropriate;
- The CRR & IÉ-IM should review the requirements prescribed in the Railway Safety Act (and current amendments) to ensure they are satisfied that all the requirements of the Railway Safety Act (and current amendments) are met in terms of RRVs being classified as rolling stock;
- IÉ-IM should review and improve its current Chief Civil Engineer (CCE) Plant and Machinery Standards; attention should be given to best international practice in RRVs; and, as a minimum, the following should be considered for inclusion:
    - Applying the requirements set out in the EN 15746/ I.S. EN 15746 standards such as controls & indicators, visibility from the cab, warning systems & communications between work positions, etc. Where, due to a technical impossibility, the design specifications of EN 15746 cannot be met in full, control measures to address these deficiencies should be clearly identified, risks assessed, and suitable controls implemented;

- The installing of an appropriate emergency warning system, which, when activated in emergency, can produce a suitably loud audible alarm and/or visual alarm. In cases, where this is not possible, as a result of a technical impossibility, control measures to address this deficiency should be clearly identified, risk assessed, and suitable controls implemented;
- Installing Wheel Slip Prevention and/or sanders on RRVs;
- Installing of Anti-Collision Devices (ACDs) on RRVs for the prevention of collisions with other RRVs, rolling stock, infrastructure and staff (through the provision of portable ACDs fitted to staff) on the IÉ network. In cases, where this is not possible, as a result of a technical impossibility, control measures to address this deficiency should be clearly identified, risk assessed, and suitable controls implemented;
- Introducing an appropriate means of communication between work positions, whereby the RRVOs and RRVCs can communicate while on-tracking, travelling on the railway and at worksites;
- Installing of data recorders on RRVs;
- The suitability of the current braking system on Type 9B RRVs where an indirect rail wheel braking system is in place; consideration should be given for the requirement to have all RRVs fitted with direct rail wheel braking systems;

- IÉ-IM are to engage with the RRV contractors in relation to updated CCE Plant and Machinery Standards; and, give clear guidelines on when these new requirements come into full effect;
- In relation to existing RRVs, IÉ-IM should assess the operation of existing RRVs to satisfy itself, on the basis of a risk assessment, that there are adequate technical and operational controls to prevent loss of control of RRV occurrences in the future;
- IÉ-IM should include, in their post-occurrence procedures, a requirement to verify the performance of RRVs (including braking performance) involved in accident, incidents or dangerous occurrences (near misses) to ensure the requirements of the CCE Plant and Machinery Standards are met in full; this should involve the completion of a full post-occurrence examination of the RRV by the contractor. A requirement that RRVs involved in accidents, incidents or dangerous occurrences (near misses) are not permitted back onto the IÉ network until the post-occurrence procedures have been completed and the RRV is confirmed fit and safe for use;
- IÉ-IM should update their CCE Plant and Machinery Standards to include requirements for RRV contractors to provide RRV information: at the acceptance stage; and, at later dates where modifications are made to RRVs. Where this information is not provided, and the requirements of the updated CCE Plant and Machinery are not met, the RRVs involved should not be allowed to operate on the IÉ network;
- IÉ-IM must develop a suitable RRVO training course which must incorporate both theory and practical elements for the operation of RRVs; there should be an assessment on completion of this initial training. When a person passes this initial training, they must complete and log supervised hours of RRV operation; and present for a final through assessment. This process should be risk assessed to determine the: number of days training; practical training requirements; number of supervised hours; and, final assessment requirements;

- IÉ-IM should develop a competency management system for the management of RRVOs competencies; this system should also include instructions related to re-training and monitoring of RRVOs after they have been involved in an accident;
- IÉ-IM should conduct a thorough review of their suite of Safety Management System (SMS) documentation and CCE Plant and Machinery standards, related to RRV contractors, to identify deficiencies in terms of the management of contractors and their plant. Where deficiencies are identified, IÉ-IM should develop new systems for the management of plant on site, and, for their safety tour and compliance verification processes to ensure contractors regularly inspect and maintain their plant in good condition; rather than the continued issuance of corrective action notices;
- IÉ-IM should review the ways in which it promotes a positive safety culture that encourages contractors to report accidents, incidents and dangerous occurrences (near misses); this can be achieved through RRVO workshops and the absence of disciplinary procedures on the reporting of occurrences;
- IÉ-IM should ensure appropriate procedures are in place for drugs and alcohol (D&A) screening for IÉ-IM and contractor staff post RRV occurrence;
- IÉ-IM should update their CCE Plant and Machinery Standards to ensure that RRV contractors are either provided with, or required to identify, the hazards associated with track gradient, rail contamination (or other low adhesion conditions) and RRV orientation and position on track through:
    - Assessing documentation on the site-specific hazards associated with RRV and ensuring these are addressed in contractor's safety documentation;
    - Setting requirements in relation to the spacing between RRVs when travelling in convoy (e.g. 100 metres (m)) and putting in place a regime to ensure these requirements are met;
    - Training RRVCs/RRVOs on the risks associated with track gradient, rail contamination and RRV orientation and guidance on how to manage these risks in a braking emergency;
- IÉ-IM should conduct an audit on RRV contractor's safety documents with a view to identifying deficiencies in terms of safety and ensuring the appropriate safety documentation is produced for the works; IÉ-IM should support and offer guidance to the RRV contractors in terms of the identification of hazards and methods of working on a railway network;
- IÉ-IM should make changes to the IÉ Rule Book to ensure that all relevant requirements set out in their CCE Plant and Machinery Standards related to RRVs are incorporated into the IÉ Rule Book;
- IÉ-IM should update their CCE Plant and Machinery Standards to include the requirements set out in Section Q 2018 of the IÉ Rule Book related to the collection of pre-operation checklists by the RRVCs from the RRVOs; and ensure these requirements are enforced through compliance verification activities;
- IÉ-IM should clearly define, document and explain the role and function of the RRVC in the management of RRVs in Section Q of the IÉ Rule Book and/or relevant CCE Plant and Machinery Standards. This should include:
    - Location of RRVC when on-tracking, during work, and off-tracking;
    - The sighting requirements of RRVCs (i.e. an RRVC should be able to see RRVs in their control at all times);
    - The allocation of RRVCs per quantity RRVs (i.e. how many RRVs per RRVs);

- IÉ-IM should review and update the training requirements of RRVCs with a view to incorporating:
    - Basic infrastructure training (e.g. points);
    - Training in communications with relevant staff;
    - Practical RRV training to ensure they have confidence in accepting pre-operations checklists from RRVOs as set out in the IÉ Rule Book;
- IÉ-IM should brief Signalmen on RRVs operations during possessions (i.e. accessing and egressing worksites and well as travelling to worksites training in terms of RRVs operating in possessions) to ensure points are set correctly for the RRV movements. Training material for Signalmen on the roles of RRVs should be updated to reflect this;
- The CRR and IÉ-IM should review their processes of closing out findings from CRR audits; with a view to identifying opportunities to close out findings, such as updates to the IÉ Rule Book.

Safety Advice Notice issued in 2019

1st January 2019 to 31st December 2019

The RAIU issued one Safety Advice Notice in 2019.

Collision of an ICR with a fixed buffer stop at Laois Train Care Depot, 6th July 2019

While undergoing maintenance intervention on Pit Road 8, LTCD, ICR 16 was moved approximately 8.25 meters under its own power before colliding with a fixed buffer stop.

The train rode up on, and moved, the buffer before coming to a stop.

There was a CME Craft worker in cab 22216 at the time of the accident. No other persons were in the vicinity of the train at the time of the accident.

The train was in a normal state with no bypasses or isolations activated or circuit breakers tripped.

The fixed buffer stop was significantly damaged.

The RAIU conduct a Safety Advice Notice, resulting in two safety recommendations, issued on the 2nd October 2019:

- IÉ-IM should review the selection of fixed buffer stops at locations at LTCD for their suitability and efficacy in protecting staff and infrastructure;
- IÉ-IM should conduct review of their current specification for fixed buffer stops and their associated design forms to ensure they are fit-for-purpose; and fixed buffer stops are only selected where appropriate. Based on this review, IÉ-IM should commence a programme of inspections for fixed buffer stop at all locations on the IÉ network to ensure their suitability and effectiveness at protecting passenger, staff, track and infrastructure.

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 RAIU safety recommendations from USANs and SANs.

Previously the CRR used three safety recommendation status definitions, namely: open; complete; and, closed. In 2019 the CRR change the status definition to allow for four different statuses, namely: open/in progress/ submitted; further evidence requested; and, closed. The figure below provides the four new definitions provided by the CRR in relation to status of safety recommendations.

Status	Description
Open/ In Progress	Feedback/evidence from the Railway Organisation is pending; or, actions have not yet been completed.
Submitted	The Railway Organisation has made a submission to the CRR advising that it has taken measures to effect the recommendation and the CRR is considering whether to close the recommendation.
Further Evidence Requested	The CRR has reviewed a submission (or further submission) but considers that further evidence is necessary to close the safety recommendation.
Closed	The CRR has reviewed a submission (or further submission) and is satisfied that the safety recommendation has been addressed.

[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 2019, the RAIU have made 187 recommendations from investigation reports, USANs and SANs. All recommendations were accepted by their addressee and implementer.

The status of the recommendations as of the end of 2019 was thirty-one open, four complete and 112 closed recommendations as illustrated below.

Year	Number of Reports / USANs/ SANs	Number of Recommendations	Status of Recommendations			
			Open / In Progress	Submitted	Further Evidence Requested	Closed
2007	0	0	0	0	0	0
2008	1	7	0	0	0	7
2009	5	13	0	0	0	13
2010	6	26	1	0	0	25
2011	7	17	0	0	2	15
2012	3	13	0	0	1	12
2013	4	9	0	0	1	8
2014	6	28	1	0	5	22
2015	2	4	0	0	2	2
2016	3	17	7	0	2	8
2017	2	9	3	0	1	5
2018	2	8	5	1	1	1
2019	5	36	29	4	2	1
Totals	46	187	46	5	17	119

The overall progress with the closure of recommendations in percentages is:

- 64% of recommendations have been closed compared with 76% in 2018. The 2019 decrease is due to the large number of recommendations issued in 2019;
- Evidence has been submitted, or further evidence has been requested in 12% of recommendations;
- 25% of recommendations are open/in progress compared with 21% in 2018.

Status of individual RAIU safety recommendations

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

Table	Title
Table 1	RAIU safety recommendations closed in 2019
Table 2	RAIU safety recommendations with 'FER' status in 2019
Table 3	RAIU safety recommendations 'Submitted' in 2019
Table 4	RAIU safety recommendations "Open/ In Progress" in 2019
Table 5	RAIU safety recommendations closed prior to 2019

Table 1 – RAIU safety recommendations closed in 2019

This section identifies the safety recommendations closed in 2019 (in order of occurrence date).

Report/USAN/SAN	Recommendation	Actions taken to close the recommendation
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.	Transdev of the opinion that a third level of communication is not necessary and are satisfied that the Tram Safety Instruction Manual adequately covers safety critical communications. The CRR have considered the evidence and closed the recommendation.
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.	The Technical Manager CCE demonstrated that the actions taken by IÉ-IM have reduced the risk from being third highest in 2010 (the year of the occurrence) to seventy-second highest. The CRR are satisfied that the risk is being managed to As Low As Reasonably Practicable (ALARP) and consider that the safety recommendation is now closed.
Summary of Investigation into SPADs on the IÉ network from January 2012 to July 2015 (published 11/04/2016)	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.	IÉ-IM Safety Department were assigned this recommendation and advised in April 2019 that they were satisfied that interfaces were fit for purpose and that Safety Critical Communications are proactively reviewed and after occurrences.
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 Level Crossing Control Operatives (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 submission made in support of human factors awareness training provided to LCCOs. IÉ-IM advised that the Professional support handbook is now published and has been issued; a copy has been provided to the CRR.
	IÉ-IM should review and update the Level Crossing Control Centre (LCCC) Instructions, to make them more user friendly for LCCOs.	Finalised LCCC Instructions in a new user-friendly format have been issued and evidence provided of the briefing to relevant staff.
Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017 (published 15/08/18)	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-IM submitted evidence demonstrating that they had revised and reissued Section E of the General Appendix and made this known through the issuances of a notice appended to the Weekly Circular No. 3865.
Wrongside Door Failure at Ashtown Station, 12th August 2018 (published 25/06/19)	IÉ-IM should re-brief Traffic Regulators on the importance of adhering to the Traffic Regulators' Manual in relation to the recording of all telephone conversations within the controlled environment.	IÉ-IM have advised that IMO-SMS-043, Traffic Regulators Manual, has been superseded by IMO-SMS-052 OP3 CTC Operations Control Room Manual.

* Light blue indicates recommendations associated with IÉ & dark blue indicates recommendations associated with Veolia (now Transdev).

Table 2 – RAIU safety recommendations with 'FER' status in 2019

This section identifies the safety recommendations where the CRR has reviewed a submission (or further submission) but considers that further evidence is necessary to close the safety recommendation, as of the end of 2019.

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.	The CRR requested further evidence in February 2019.
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.	The CRR requested further evidence in February 2019. Evidence was provided by IÉ-IM in August 2019 and is now under review.
Car Strike at Morrough 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.	Evidence provided by IÉ-IM in May 2019, but further evidence has been requested by the CRR.
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.	Further evidence requested by the CRR.
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.	Further evidence requested by the CRR.
	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.	Further evidence requested by the CRR.
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.	Further evidence requested by the CRR.
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.	Further evidence requested by the CRR.
	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.	Further evidence requested by the CRR.
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.	Further evidence requested by the CRR.
	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.	Further evidence requested by the CRR.
Summary of Investigation into SPADs on the IÉ network from January 2012 to July 2015 (published 11/04/2016)	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.	IÉ-IM submitted further evidence in June 2019 which is currently under review by the CRR.

Report	Recommendation	Status
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.	IÉ-IM submitted further evidence in April 2019, however, the CRR have requested further evidence.
Near miss at Knockcroghery Level Crossing, XM065, Co. Roscommon, 31st January 2017 (published 20th December 2017)	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.	IÉ-IM submitted evidence in March 2019, the CRR requested further information in Aril 2019.
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.	Further evidence requested by the CRR.
Wrongside Door Failure at Ashtown Station, 12th August 2018 (published 25th June 2019)	IÉ-RU CME should review VMI Z1C29A0001 'Examination of 29000 class vehicle after an incident / accident' to develop a more thorough and robust VMI that is commensurate with the safety risk of faults occurring after rolling stock has been involved in an incident or accident.	IÉ-RU submitted further evidence, which is under review by the CRR.
Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018 (published 3rd September 2019)	IÉ-IM should carry out a full review of known misused user worked level crossings on public and private roads and should develop a programme to either close or upgrade the level crossings to minimise misuse; where possible, level crossings with the highest risks should be addressed first.	Further evidence requested by the CRR.

* Light blue indicates recommendations associated with IÉ-IM or IÉ-RU.

Table 3 – RAIU safety recommendations 'Submitted' in 2019

This section identifies the safety recommendations where The Railway Organisation has made a submission to the CRR advising that it has taken measures to effect the recommendation and the CRR is considering whether to close the recommendation.

Report	Recommendation	Status
Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017 (published 15th August 2018)	IÉ-IM 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 have submitted evidence for review.
Road Rail Vehicle occurrences on Iarnród Éireann Network from 2015 to 2018 (published 8th October 2019)	The CRR & IÉ-IM should review the requirements prescribed in the Railway Safety Act (and current amendments) to ensure they are satisfied that all the requirements of the Railway Safety Act (and current amendments) are met in terms of RRVs being classified as rolling stock.	IÉ-IM have submitted evidence for review.
	IÉ-IM should ensure appropriate procedures are in place for Drugs & Alcohol screening for IÉ-IM and contractor staff post RRV occurrence.	IÉ-IM have submitted evidence for review.
	IÉ-IM should brief Signalmen on RRVs operations during possessions (i.e. accessing and egressing worksites and well as travelling to worksites training in terms of RRVs operating in possessions) to ensure points are set correctly for the RRV movements. Training material for Signalmen on the roles of RRVs should be updated to reflect this.	IÉ-IM have submitted evidence for review.
	The CRR and IÉ-IM should review their processes of closing out findings from CRR audits; with a view to identifying opportunities to close out findings, such as updates to the IÉ Rule Book.	IÉ-IM have submitted evidence for review.

* Light blue indicates recommendations associated with IÉ; lilac indicates a joint recommendation between IÉ-IM & the CRR.

Table 4 – RAIU safety recommendations "Open/ In Progress" in 2019

This section identifies the safety recommendations where feedback or evidence from the Railway Organisation is pending; or, actions have not yet been completed.

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 progress in 2019.
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 progress in 2019.
	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 progress in 2019.
	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 progress in 2019.
	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 progress in 2019.
	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 progress in 2019.
	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 progress in 2019.
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. Northern Ireland Railways (NIR) have also closed this recommendation. Although this recommendation was closed for IÉ-RU, it remains open against the Railway Preservations Society of Ireland (RPSI) & other maintenance railway organisations operating on the IÉ network.	This recommendation has been closed by IÉ-RU and NIR but remains open against the RPSI and other maintenance organisations operating on the IÉ network.
Difflin Light Rail (DIL) 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 progress in 2019.
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 progress in 2019.
	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 progress in 2019.

Report	Safety recommendation	Status
Derailment of DART passenger service, at Points DL115, Dun Laoghaire, 13th September 2017 (published 15th August 2018)	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 remains open / in progress in 2019.
	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 remains open / in progress in 2019.
	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 remains open / in progress in 2019.
	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 remains open / in progress in 2019.
USAN 002 Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018 (issued on the 17/08/2018)	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.	This recommendation remains open / in progress in 2019.
Wrongside Door Failure at Ashtown Station, 12th August 2018 (published 25th June 2019)	IÉ-RU CME should review VMIs associated with the examination of rolling stock after an incident / accident, for all rolling stock fleets, to develop a more thorough and robust VMI that is commensurate with the safety risk of faults occurring after rolling stock has been involved in an incident or accident.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should review their scheduled maintenance examinations, for multiple-unit fleets, with a view to developing a means to check the connection is correct on the electrical head.	This recommendation was made in 2019 and remains open / in progress.
Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018 (published 25th June 2019)	IÉ-RU CME should review their SSOW & OI and associated documents related to the identification, communication and prevention of movement of defective vehicles to ensure relevant staff are made aware of identified defects and that the defective vehicles are adequately labelled and tagged; and these processes and staff responsibilities are fully understood by all CME staff working on trains.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should review the suite of LTCD documents that relate to the management of moving trains within LTCD to ensure they are consistent and adequately reference any existing supporting documentation (e.g. ICR Hauling Assisting Instructions).	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should review its training and competency of CME Drivers and Limited Shunters ensuring the stabling and movement of vehicles (defective or otherwise) are adequately addressed.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should expand the requirements of preparation instructions for rail vehicles to ensure that on completion of these tests the brake status of a train can be fully established; this should include checking the status of circuit breakers and brake isolations.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should re-brief staff on the correct procedure for disembarking from a moving train.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-RU CME should develop a formal procedure for the examination of vehicles prior to moving a train which has been left unattended with no direct handover.	This recommendation was made in 2019 and remains open / in progress.

Report	Safety recommendation	Status
Collision of an ICR with a buffer stop at Laois Train Care Depot, 17th July 2018 (published 25th June 2019)	IÉ-RU CME should determine who has overall responsibilities for the movement of trains within the confines of LTCD, including who is allocated the role of Designated Person Responsible for Protection, and, clearly brief these responsibilities in the CME Training Course and the SSOW & OI.	This recommendation was made in 2019 and remains open / in progress.
Vehicle struck by train at Cartron level crossing, XM220, Co. Mayo, 17th August 2018 (published 3rd September 2019)	IÉ-IM should consider options to upgrade LC XM220 to minimise the requirement of direct action by the users.	This recommendation was made in 2019 and remains open / in progress.
	DTTAS should review, in consultation with the relevant stakeholders, their current advance warning signage (W 121) with a view changing the signage to make it clear to road users that they are approaching a user operated level crossing. They should also consider the introduction of other traffic calming measures in efforts to encourage safe road user behaviour. Care should be taken not to inadvertently introduce new risks as a result of their proposed measures.	This recommendation was made in 2019 and remains open or in progress.
Road Rail Vehicle occurrences on Iarnród Éireann Network from 2015 to 2018 (published 8th October 2019)	The DTTAS should review the Railway Safety Act 2005 and current amendments to make clear the classification of RRVs; consultation should be sought with the Commission for Railway Regulation (CRR); and, relevant stakeholders where appropriate.	This recommendation was made in 2019 and remains open / in progress.
	The CRR & IÉ-IM should review the requirements prescribed in the Railway Safety Act (and current amendments) to ensure they are satisfied that all the requirements of the Railway Safety Act (and current amendments) are met in terms of RRVs being classified as rolling stock.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-IM should review and improve its current Chief Civil Engineer (CCE) Plant and Machinery Standards; attention should be given to best international practice in RRVs; and, as a minimum, the following should be considered for inclusion: • Applying the requirements set out in the EN 15746/ I.S. EN 15746 standards such as controls & indicators, visibility from the cab, warning systems & communications between work positions, etc. Where, due to a technical impossibility, the design specifications of EN 15746 cannot be met in full, control measures to address these deficiencies should be clearly identified, risks assessed, and suitable controls implemented; • The installing of an appropriate emergency warning system, which, when activated in emergency, can produce a suitably loud audible alarm and/or visual alarm. In cases, where this is not possible, as a result of a technical impossibility, control measures to address this deficiency should be clearly identified, risk assessed, and suitable controls implemented; • Installing Wheel Slip Prevention and/or sanders on RRVs; • Installing of Anti-Collision Devices on RRVs for the prevention of collisions with other RRVs, rolling stock, infrastructure and staff (through the provision of portable ACDs fitted to staff) on the IÉ network. In cases, where this is not possible, as a result of a technical impossibility, control measures to address this deficiency should be clearly identified, risk assessed, and suitable controls implemented; • Introducing an appropriate means of communication between work positions, whereby the RRVOs and RRVCs can communicate while on-tracking, travelling on the railway and at worksites; • Installing of data recorders on RRVs; • The suitability of the current braking system on Type 9B RRVs where an indirect rail wheel braking system is in place; consideration should be given for the requirement to have all RRVs fitted with direct rail wheel braking systems.	This recommendation was made in 2019 and remains open / in progress.
	IÉ-IM are to engage with the RRV contractors in relation to updated CCE Plant and Machinery Standards; and, give clear guidelines on when these new requirements come into full effect.	This recommendation was made in 2019 and remains open or in progress.

Report	Safety recommendation	Status
Road Rail Vehicle occurrences on Iarnród Éireann Network from 2015 to 2018 (published 8th October 2019)	In relation to existing RRVs, IÉ-IM should assess the operation of existing RRVs to satisfy itself, on the basis of a risk assessment, that there are adequate technical and operational controls to prevent loss of control of RRV occurrences in the future.	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM should include, in their post-occurrence procedures, a requirement to verify the performance of RRVs (including braking performance) involved in accident, incidents or dangerous occurrences (near misses) to ensure the requirements of the CCE Plant and Machinery Standards are met in full; this should involve the completion of a full post-occurrence examination of the RRV by the contractor. A requirement that RRVs involved in accidents, incidents or dangerous occurrences (near misses) are not permitted back onto the IÉ network until the post-occurrence procedures have been completed and the RRV is confirmed fit and safe for use.	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM should update their CCE Plant and Machinery Standards to include requirements for RRV contractors to provide RRV information: at the acceptance stage; and, at later dates where modifications are made to RRVs. Where this information is not provided, and the requirements of the updated CCE Plant and Machinery are not met, the RRVs involved should not be allowed to operate on the IÉ network.	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM must develop a suitable RRVO training course which must incorporate both theory and practical elements for the operation of RRVs; there should be an assessment on completion of this initial training. When a person passes this initial training, they must complete and log supervised hours of RRV operation; and present for a final through assessment. This process should be risk assessed to determine the: number of days training; practical training requirements; number of supervised hours; and, final assessment requirements.	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM should develop a competency management system for the management of RRVOs competencies; this system should also include instructions related to re-training and monitoring of RRVOs after they have been involved in an accident;	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM should conduct a thorough review of their suite of SMS documentation and CCE Plant and Machinery standards, related to RRV contractors, to identify deficiencies in terms of the management of contractors and their plant. Where deficiencies are identified, IÉ-IM should develop new systems for the management of plant on site, and, for their safety tour and compliance verification processes to ensure contractors regularly inspect and maintain their plant in good condition; rather than the continued issuance of corrective action notices.	This recommendation was made in 2019 and remains open or in progress.
	IÉ-IM should review the ways in which it promotes a positive safety culture that encourages contractors to report accidents, incidents and dangerous occurrences (near misses); this can be achieved through RRVO workshops and the absence of disciplinary procedures on the reporting of occurrences.	This recommendation was made in 2019 and remains open or in progress.

Report	Safety recommendation	Status
Road Rail Vehicle occurrences on Iarnród Éireann Network from 2015 to 2018 (published 8th October 2019)	IÉ-IM should update their CCE Plant and Machinery Standards to ensure that RRV contractors are either provided with, or required to identify, the hazards associated with track gradient, rail contamination (or other low adhesion conditions) and RRV orientation and position on track through: • Assessing documentation on the site-specific hazards associated with RRV and ensuring these are addressed in contractor's safety documentation; • Setting requirements in relation to the spacing between RRVs when travelling in convoy (e.g. 100 m) and putting in place a regime to ensure these requirements are met; • Training RRVCs/RRVOs on the risks associated with track gradient, rail contamination and RRV orientation and guidance on how to manage these risks in a braking emergency.	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should conduct an audit on RRV contractor's safety documents with a view to identifying deficiencies in terms of safety and ensuring the appropriate safety documentation is produced for the works; IÉ-IM should support and offer guidance to the RRV contractors in terms of the identification of hazards and methods of working on a railway network.	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should make changes to the IÉ Rule Book to ensure that all relevant requirements set out in their CCE Plant and Machinery Standards related to RRVs are incorporated into the IÉ Rule Book.	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should update their CCE Plant and Machinery Standards to include the requirements set out in Section Q 2018 of the IÉ Rule Book related to the collection of pre-operation checklists by the RRVCs from the RRVOs; and ensure these requirements are enforced through compliance verification activities.	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should clearly define, document and explain the role and function of the RRVC in the management of RRVs in Section Q of the IÉ Rule Book and/or relevant CCE Plant and Machinery Standards. This should include: • Location of RRVC when on-tracking, during work, and off-tracking; • The sighting requirements of RRVCs (i.e. an RRVC should be able to see RRVs in their control at all times); • The allocation of RRVCs per quantity RRVs (i.e. how many RRVs per RRVs).	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should review and update the training requirements of RRVCs with a view to incorporating: • Basic infrastructure training (e.g. points); • Training in communications with relevant staff; • Practical RRV training to ensure they have confidence in accepting pre-operations checklists from RRVOs as set out in the IÉ Rule Book.	This recommendation was made in 2019 and remains open/ in progress.
SAN 001 Collision of an ICR with a fixed buffer stop at Laois Train Care Depot, 6th July 2019 (issued 02/10/19)	IÉ-IM should review the selection of fixed buffer stops at locations at LTCD for their suitability and efficacy in protecting staff and infrastructure.	This recommendation was made in 2019 and remains open/ in progress.
	IÉ-IM should conduct review of their current specification for fixed buffer stops and their associated design forms to ensure they are fit-for-purpose; and fixed buffer stops are only selected where appropriate. Based on this review, IÉ-IM should commence a programme of inspections for fixed buffer stop at all locations on the IÉ network to ensure their suitability and effectiveness at protecting passenger, staff, track and infrastructure.	This recommendation was made in 2019 and remains open/ in progress.

* light blue indicates recommendations associated with IÉ-IM & IÉ-RU, dark blue Transdev (formally Veolia), lilac the CRR, light pink the DLR; and, orange the DTTAS.

Table 5 – RAIU safety recommendations closed prior to 2019

This section identifies the safety recommendations closed prior to 2019:

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

Report	Safety Recommendations	Closed
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
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

Report	Safety Recommendations	Closed
Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 (published 16/08/10)	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
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

Report	Safety Recommendations	Closed
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.	2018
	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
	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.	2018
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
Car Strike at Morrough 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
	IÉ should ensure that they adopt their own standards in relation to design changes to any plant, equipment, infrastructure or operations that has the potential to affect safety.	2018
	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 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.	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

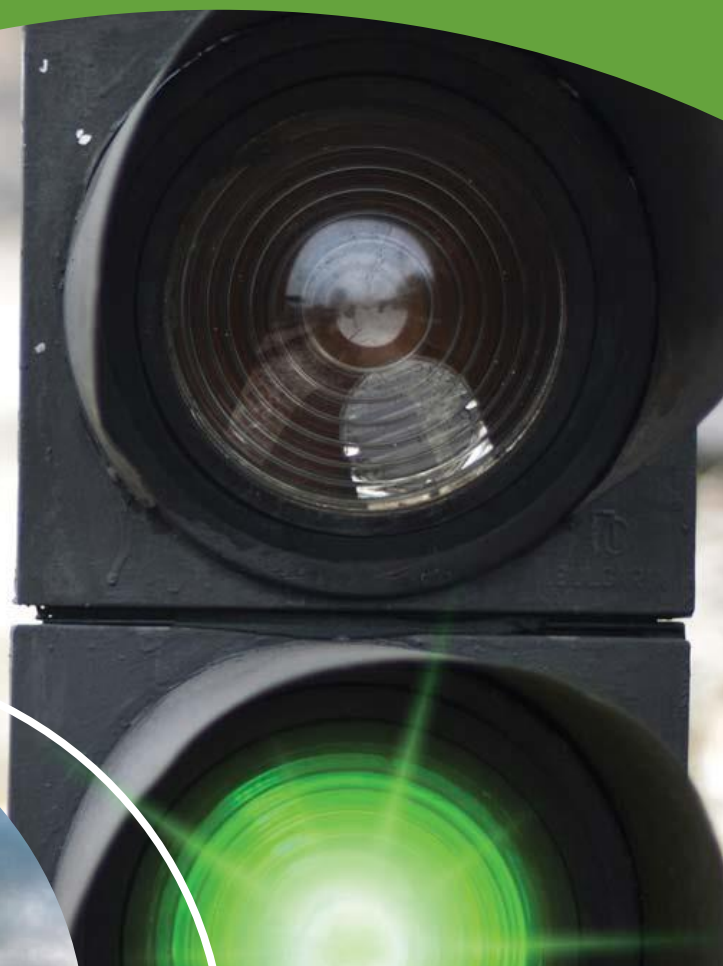
Report	Safety Recommendation	Closed
Bearing failure on a train at Connolly Station, 18th October 2011 (published 26th September 2012)	IÉ should put in place provisions to assist train drivers with the task of identifying if there is a fault present with an axlebox.	2013
	IÉ should ensure the competency 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 system for introducing new train drivers' manuals, to ensure that train drivers are fully trained and assessed in all aspects of these manuals.	2018
	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
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
	IÉ should review current communication procedures with regard to the updated communication equipment now available.	2018
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

Report	Safety Recommendation	Closed
USAN 001 DART Wrongside Door Failure, Salthill & Monkstown Station, 18th August 2013 (issued on the 19/08/2013)	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).	2013
	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).	2013
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
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
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.	2018

Report	Safety Recommendation	Closed
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 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.	2018
	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
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.	2018
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.	2018
	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.	2018
	DLR should review their responsibilities under the Safety and Welfare at Work Regulations as to dedicated First Aid areas.	2018

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

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. Rhomberg Sersa operate as an RU on IÉ's rail system; they operate and maintain On Track Machines (OTMs) on behalf of IÉ.

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

CCE	Chief Civil Engineer
CME	Chief Mechanical Engineer
CRR	Commission of Railway Regulation
CTC	Centralised Traffic Control
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
ES	Engineering Supervisor
EU	European Union
FER	Further Evidence Requested
ICR	InterCity Railcar
hrs	hours
HSA	Health & Safety Authority
IÉ	Iarnród Éireann
IM	Infrastructure Manager
LCCO	Level Crossing Control Operative
LTCD	Laois Train Car Depot
MP	Mile Post
NIB	National Investigation Body
OHLE	Overhead Light Equipment
PEIO	Plant, Equipment, Infrastructure & Operations
PER	Preliminary Investigation Report
PICOP	Person in Charge of Possession
RAIU	Railway Accident Investigation Unit
RRV	Road Rail Vehicle
RU	Railway Undertaking
SET	Signalling, Electrical and Telecommunications
SAN	Safety Advice Notice
TRV	Track Recording Vehicle
USAN	Urgent Advice Safety Notice

Address: Second Floor, 2 Leeson Lane, Dublin 2.

Telephone: +353 1 604 1050

Email: info@raiu.ie

Website: www.raiu.ie

RAIU