THE NATIONAL SAFETY AUTHORITY FOR RAILWAYS IN IRELAND

2021 ANNUAL REPORT TO THE EUROPEAN UNION AGENCY FOR RAILWAYS

CRR
AN COIMISIÚN UM RIALÁIL IARNRÓID
COMMISSION FOR RAILWAY REGULATION

Version control

Document issued by:	Commission for Railway Regulation Temple House, Blackrock, Co. Dublin, Ireland
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Version:	1
Date:	30/09/2022
Type of document:	Report
Status of document:	Issued

Amendment record

Version	Date	Issuer	Modifications	Distribution
1.0				

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Contents

Definitions and abbreviations

CSI	Common Safety Indicator
CSM	Common Safety Method
CST	Common Safety Target
DoT	Department of Transport
EC	European Commission
ECM	Entities in charge of maintenance
EMM	Enforcement Management Model
ERA	European Union Agency for Railways
ERAIL	European Railway Accident Information Links
ERTMS	European Railway Traffic Management System
EU	European Union
FTE	Full Time Equivalent
IM	Infrastructure Manager
IOD	Interoperability Directive
NIB	National Investigation Body for railway accidents
NoBo	Notified Body
NRV	National Reference Value for CST
NSA	National Safety Authority for railways
PRM TSI	Technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility
RAIU	The Railway Accident Investigation Unit, the NIB in Ireland
Railway Organisation	An Irish legal term that collectively describes Railway Undertakings and Infrastructure Managers
RSD	Railway Safety Directive
RU	Railway Undertaking
SMS	Safety Management System
TDD	Train Drivers Directive
TSI	Technical Specification for Interoperability
VA	Vehicle Authorisation

1 Introduction

1.1 Purpose, scope and addressees of the report

1.1.1 Purpose and scope of the report

The Commission for Railway Regulation (CRR) is pleased to submit its annual report to the European Union Agency for Railways (ERA) for the year 2021. This is the first annual report under the CRR's current strategy for 2021–2024.

Article 19 of the Railway Safety Directive 2016/798/EC (the Directive that is transposed in Ireland by Statutory Instrument 476 of 2020) requires the CRR to publish an annual report by 30th September each year concerning its activities in the preceding year and to send it to the European Union Agency for Railways (ERA).

In this report, the CRR endeavours to show how the railway system in Ireland is performing, highlighting difficulties and good practices while fostering and encouraging the railway industry in Ireland on its safety improvement journey. This report aims to provide evidence of the CRR's ongoing efforts to improve safety performance in the State, communicate its main safety messages and objectives, show what it is doing and why, and explain how well it is succeeding.

The geographic scope of this report is the 1600mm gauge national railway system in Ireland.

1.1.2 Structure/data to which the document refers

The annual report shall contain information on:

- The development of railway safety, including an analysis at Member State level of the common safety indicators (CSIs) laid down in Annex I of the Railway Safety Directive.
- Important changes in legislation and regulation concerning railway safety.
- The development of safety certification and safety authorisation.
- Results of and experience relating to the supervision of infrastructure managers and railway undertakings.
- Derogations for entities in charge of maintenance of vehicles decided in accordance with Article 14a(8) of the Directive.

This report uses the assigned template (GUI_MRA_002 V 3.0) which includes the extended requirements under the fourth railway package.

1.1.3 Target audience of the report

To improve European railway safety, the ERA needs to understand how the EU railway system is functioning and any issues that are impacting on safety performance. This annual report demonstrates how the CRR, as National Safety Authority (NSA) for railways in Ireland, is promoting the EU rail regulatory framework while fulfilling its tasks under the Railway Safety Directive (EU) 2016/798.

This report offers some insight to the operational railway companies and applicants for safety certification and safety authorisation, including the railway undertakings (RU), the infrastructure manager (IM) and the entities in charge of maintenance of vehicles (ECM), which should help them to continually improve their safety management systems (SMS).

This report may also be of interest to the National Investigating Body (NIB) for railway occurrences and to the Department of Transport (DoT).

1.1.4 Availability of the report to stakeholders

This report will be published on the websites of the CRR and the ERA.

1.2 Main conclusions on the reporting year

1.2.1 Main conclusion about how the railway system performed

2021 continued to be an unusual and difficult year for the railway sector in Ireland, with a second year of significant restrictions on people's mobility due to the continuing COVID-19 pandemic. Fortunately, conditions for the sector improved markedly as the year progressed, with the severity and incidence of COVID-19 receding so that a graduated reduction in mobility restrictions materialised. The sector, as with much of society, adapted to new methods of working and continued to provide a transport service for customers. From a regulatory perspective, many activities continued online thus reducing opportunities to engage with the railway system in person. In general, the whole sector performed well and continued to display resilience to what were unprecedented and challenging circumstances.

2021 is considered likely to be an outlier when it comes to review railway statistics. Passenger numbers were similar to 2020, but still 64% down from 2019. Freight volumes in Ireland remained mostly unchanged in 2021, which indicates its small volumes were relatively unaffected by the pandemic. A changing pattern seems to be emerging with use of the system by passengers, with recreational and cultural activities driving passenger demand. A sustained shift to more people working from home seems to have reduced demand for commuter travel. All of this impacts on safety risk, resulting in 2021 being an unusual year and hard to compare to previous years, with the exception of 2020. As such, it is unknown if 2020 was the start of a new trend or a temporary breakdown in previous trends, with this uncertainty making meaningful analysis of safety performance challenging. At the end of 2021, the longer term impact of the pandemic and the potential impact on the railway system remain to be determined. The safety performance for the railway system in 2021 is considered generally positive and continues Ireland's good performance for CSI categories.

While no SMS certification/authorisations were issued in 2021, conformity assessment activities did involve pre-engagement with Iarnród Éireann – Infrastructure Manager for the renewal of the authorisation of their safety management system.

Extensive supervisory functions including audit and inspection were planned and carried out on a risk basis. On the national rail network, formal enforcement after an audit or inspection was required in two instances. Two accidents required formal enforcement following an inspection of circumstances.

One significant accident is reported for 2021. Numbers are generally small in this category hence the CRR is very conscious of how performance can change quickly, but it is evident there is a good long-term trend in this area.

1.2.2 Overall trends

2021 continued to be a time unique in the history of railway transport and determining its relevance to recent trends is a difficult task in the short term. The pandemic and continued extensive reduction in use of the railway system in Ireland meant that the safety risk profile of the system likely altered, with this being manifested in indicators that are influenced by the volume of passengers on the system.

There were no passenger fatalities in 2021. One person who accessed the track without permission was struck by a train, the only significant accident for the year. 4 people lost their lives after trespassing onto the railway in what are considered to be acts of self-harm. There were no reports of deaths at level crossings.

2021 saw a rise in train collisions, particularly with large animals and especially deer. Signal Passed At Danger (SPAD) occurrences declined slightly, with 8 reported in 2021. Even though the number of such events remains low, this accident precursor will remain a focus for the CRR given the low percentage of services that avail of automatic train protection.

1.2.3 Impact of the above analyses on the next year activities

Ascertaining a trend in accident and incident statistics in Ireland is difficult given that the number of occurrences is very low. In 2022, the CRR Supervision Team will focus as always on those key assets that give cause for concern. In planning its annual program of work every year the CRR reviews the safety performance of each RU and IM, including the type and number of accidents, incidents they have suffered, audit and inspection findings, complaints and representations by, or on behalf of staff and passengers. Using this data, together with professional judgement, new supervision plans are developed for the forthcoming year.

These supervision plans are risk based meaning those RU's and the IM that have greater exposure to risk, by virtue of the size of the operation, can expect more supervision than those who have limited exposure to risk. The CRR adopts the principals for supervision that include proportionality, consistency and transparency and we work closely with the RU's and the IM we regulate to ensure a safe system.

1.2.4 Priority actions for the next year

With the transposition of the Railway Safety Directive and the Interoperability Directive in 2020, the CRR will continue to include actions to ensure that both Railway Undertakings and the Infrastructure Manager are aware of the new requirements which they place on them. Similarly, we will ensure that we as the NSA are in a position to assist the regulated entities to meet these requirements.

The CRR renewed its Statement of Strategy in 2021 and will therefore prioritise engagement with all the sector stakeholders to ensure that the new strategy reflects the key objectives relevant to the future development of our national rail system and its continuous improvement.

2 Summary

The CRR performed a wide range of activities relating to its safety and regulatory functions. In 2021, COVID-19 continued to have a significant impact on how the railway was used and how the sector worked. In terms of railway system use, the railway system in Ireland is predominantly used for passenger services and in 2021 the demand for services from passengers declined dramatically by some 64% from 2019. 2021 and 2020 displayed similar passenger demand, with 870 million passenger kms recorded for 2021 against 864 passenger kms recorded for 2020. For earlier periods in 2021 the decline was greater still as significant public health safety measures reduced people's mobility. Such deterioration in passenger volumes inevitably impacts on safety risk, but as CSI data shows the relationship is certainly not directly proportionate. 5 people lost their lives in accidents involving trains in motion, all related to trespass. Unfortunately, this number of fatalities is not unusual and is within a normal trend for the Irish system.

In terms of working during the pandemic with restrictions on movement, much of the sector in Ireland worked remotely or at home where possible in a similar manner to 2020. It became apparent throughout the year that remote working will be more prevalent for workers in Ireland, and this is likely to impact on railway system usage. Core tasks such as maintenance and operation continued to be executed on the railway related sites. Train services were available at only a slightly reduced frequency but at a much-reduced capacity for much of the year. The CRR performed most of its functions remotely, and along with much of the rest of the Irish public service is moving towards a working model where employees may blend time in the office with remote working.

Core NSA functions continued to be performed in 2021, which included work associated with the certification and authorisation required under EU legislation, Designated Body recognition, as well as safety supervisory functions on the regulated entities, including audit and inspection planned on a risk-based analysis. We continued to monitor RU's and the IM implementation of CRR required actions and the recommendations of the Rail Accident Investigation Unit (RAIU), where progress is observed to be reasonable.

In addition, the CRR as the regulator and monitoring body for the Infrastructure Manager Multi Annual Contract fulfilled all its assigned functions.

In 2021, the CRR did not issue any letters confirming vehicle authorisation. An associated guideline for this activity, 'CRR-G-009-G Guidance on Application for Authorisation and Application for Acceptance for Heavy Rail Fixed Installations and Vehicles', was published in February. There were no safety certificates or safety authorisations issued by the CRR in 2021. However, pre-engagement did commence with Iarnród Éireann – Infrastructure Manager in relation to their authorisation renewal required in 2022. As recognition body for Designated Bodies (DeBoS) for the IE network the CRR worked on the first application for recognition during 2021. An IE DeBo recognition certificate was issued in January 2022. One Certificate was issued by the NSA when acting as Designated Body for the INF Subsystem. One Authorisation for Placing in Service of a Fixed Installation for the CCT Subsystem was also issued.

The CRR carries out supervision and enforcement functions with an emphasis on support, advice, encouragement and when necessary, direction. In 2021, CRR inspectors commenced a total of 95 Inspections broken down as follows:

- IÉ-IM 63 Inspections.
- IÉ-RU 23 Inspections.
- NIR 1 Inspection.
- RPSI 4 Inspections.
- RSIE 4 Inspections.

These inspections included sample checks on infrastructure assets, depots, train driver licences, train operations and rolling stock maintenance activities etc. They resulted in a multitude of outcomes ranging from 'scope for improvement' where action is determined by the railway organisation to 'minor non-compliance' where evidence is sought by CRR inspectors to see that action has been taken. With regards to audits, these were fewer in number given the greater resource requirement for such activities and the fact that on-site face-to-face activities remained curtailed for much of 2021. Two audits were undertaken in 2021 but not finalised in the year.

Of concern were several occurrences, involving Iarnród Éireann employees and contractors, that under slightly different conditions could have also resulted in loss of life, these included:

- A contractor working under the direction of an Iarnród Éireann Supervisor fell from a Road Rail Vehicle Bucket as it transited to a worksite.
- A member of Iarnród Éireann Track Engineering staff narrowly avoided being hit by a moving train as they were recording rail temperatures.
- A train collided with track maintenance equipment and narrowly avoided hitting several engineering staff.
- The overturning of a Road Rail Vehicle in an engineering possession.

Several of the above occurrences are solely due to safety rules not being adhered to by staff. In two of the above instances the CRR used its enforcement powers (requesting an Improvement Plan in accordance with s. 76 of the Railway Safety Act 2005, as amended) to bring about improvements in safety. CRR Inspectors continue to engage with sector organisations on these issues.

Two new legal statutory instruments were published in 2021, one associated with dangerous goods and other with fees for Designated Body activities.

The CRR published its strategy for 2021-2024 in October which is available to read on the CRR website.

In what was a challenging year due to the uncertainty associated with the pandemic, the sector in Ireland maintained its good safety record whilst also adapting to new patterns of system usage that are likely to remain for some time to come.

3 NSA safety strategy, programs, initiatives and organisational context

3.1 Strategy and planning activities

2021 was the first year of the CRR's current three-year strategy which was developed in consultation with all stakeholders. Within the new strategy the CRR is committed to advancing railway safety, through effective regulation, and by fostering and encouraging the continuous improvement in safety management by railway organisations. It advocates the participation of all stakeholders in the further development of Ireland's rail sector so that it is a safe and efficient mode of transport that benefits our society.

In accordance with the CRR's vision of "safe and sustainable railways that provide efficient and convenient transport for society", its safety initiatives are linked to the main safety critical areas and indicators of accidents and precursors in order to improve the CSI trends.

We have set key strategic priorities relating to rail safety, railway regulation, engagement with Government, communication with stakeholders and for our own organisation.

We have also set key values for how we work, which include integrity, respect, independence and excellence in what we do.

Also of note is the implementation of elements that were developed in the CRR action plan to address a number of deficiencies identified during the ERA NSA monitoring audit in 2020. This continuing work is addressing the development of the supervision strategy in line with CSM 2018/761, prioritisation of activities including investigations, efficiency of different types of supervision activity and the systematic review of procedures and documentation.

As with every other year, the CRR produced a plan of its supervision activity and the main areas that were to be focused on through audit and inspection. COVID-19 continued to have a major impact on the working environment in Ireland and throughout Europe in 2021. Against this background, while complying with all public health restrictions, we ensured that our conformity assessment, authorisation to place in service, supervision and regulatory functions continued to be performed and were in line with all notifications from the Agency and Commission.

3.1.1 NSA process of review and continual improvement of its strategy and planning of activities/initiatives

3.1.1.1 CRR supervision

In terms of the CRR's supervision activities, these are planned annually on a risk basis using qualitative and quantitative means. During the year the CRR Supervision team meet bi-weekly at which time ongoing tasks and activities were discussed. At these meetings Inspectors shared experiences and often as a result of these discussions the scope of an activity changes or the way we will undertake the activity changes.

Moreover, the CRR Supervision team together with colleagues from the Conformity Assessment and APIS Team come together annually to essentially undertake a SWOT Analysis of the year's supervision activities.

Inspectors are encouraged to share what they felt worked well and what did not. Similarly, staff are encouraged to suggest new supervision activities or methods for same. At this 'Workshop' Inspection Templates are reviewed and where necessary amended thereby demonstrating continuous improvement/refinement of our supervision processes. At the 2021 'Workshop' it was agreed that for the 2022 Annual Supervision Programme all activities would be assigned a priority, thereby assisting Supervision Inspectors when planning work. This change was made on foot of a recommendation from the ERA Cross Audit conducted in 2020.

3.1.1.2 Assessments and authorisation

The CRR re-issued CRR-G-030, Application Guide for Single Safety Certificates, Safety Authorisations and Safety Management Certificates in December 2021.

There is one infrastructure manager and a small number of railway undertakings operating on the network in the Republic of Ireland. This means we can determine what SMS certification/ authorisation applications will be made in a given year. There were no Single Safety Certificates, Safety Authorisations or Safety Management Certificates issued in 2021. The CRR commenced the pre-engagement phase with the infrastructure manager for renewal of their Safety Authorisation which needed to be complete by March 2022.

The CRR re-issued CRR-G-009, Guidance on Application for Authorisation and Application for Acceptance for Heavy Rail Fixed Installations and Vehicles in February 2021.

With regard to authorisation to place in service projects, at the end of each year the principal inspector communicates with all potential applicants to determine as far as possible what applications are expected in the coming year to assist with resource and competency planning.

3.1.2 NSA strategies in international activities

Due to COVID-19, the potential for direct face to face engagement relating to international activities was seriously restricted. The CRR did however ensure that it had the capacity to engage in such activities virtually.

The CRR, although a small NSA, values participation in as many national and international fora as possible. The virtual engagement included the ERA's NSA Network, European Commission's Railway Safety and Interoperability Committee, ERA Working Groups and Task Forces.

In addition, our nominees continued to contribute to work of the International Liaison Group for Government Railway Inspectorates (ILGGRI) plenary meetings and railway related conferences. Again, all this being done virtually.

The CRR is also an active member of the International Railway Safety Council (IRSC) which it sees as an excellent forum for the exchange of experience and lessons for improving railway safety. In 2021, the CRR attended the IRSC virtual conference.

3.2 NSA measures adopted or planned regarding to the recommendations issued by NIB and monitoring of their implementation status

(in accordance with art. 26(2) of the Directive (EU) 2016/798)

This is an ongoing task of the CRR Supervision Team and the CRR have been monitoring the implementation of NIB Safety Recommendations since 2008. Safety recommendations issued by the NIB to the CRR are reviewed and formally issued by means of a letter to the necessary organisations. The organisations in turn are required to advise the CRR of their acceptance or otherwise, together with details of actions taken or proposed or details as to why they believe no action is necessary.

Thereafter periodic meetings (typically quarterly) are held with the principal RUs and the IM to review progress. Records are kept and there is then a formalised method by which evidence is submitted, reviewed and closed. The status of recommendations are shown in the following table.

NIB safety recommendations

Year	Reports	Open	Submitted	FER	Closed
2010	5	1	0	0	25
2011	6	0	0	2	14
2012	3	0	0	0	13
2013	2	0	0	1	9
2014	5	0	0	5	16
2015	2	0	0	2	2
2016	3	6	0	2	12
2017	1	0	0	3	2
2018	1	1	0	3	5
2019	4	18	0	7	9
2020	3	5	0	1	2
2021	4	20	0	0	1

The status categories are:

Open/In progress: Feedback (Evidence) from Railway Organisation (or another party) is awaited or actions have not yet been completed.

Submitted: The Railway Organisation (or other party) 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.

FER (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.

3.3 Safety measures implemented unrelated to the NIB safety recommendations

3.3.1 NSA measures adopted or planned by NSA

The focus of the CRR's 2021 Supervision Programme was to:

1. Supervise the continued application of the Railway organisations approved SMS, i.e., checking compliance with legal requirements, i.e., Common Safety Methods, the Railway Safety Act 2005.
2. Supervise areas of identified risk, and RU/IM Risk Control Measures.
3. Encourage ROs to 'Move Beyond Compliance' i.e., challenging their SMSs to not only ensure compliance but that they are truly delivering expected outcomes.
4. Promote human factors training for RO staff to improve awareness and knowledge. Promote the need for organisation leaders (Managers) to promote internally a positive organisational/safety culture.
5. Install in the minds of railway company personnel that safety is their no. 1 policy.

The CRR's principal supervision activities, i.e., audits, inspections and meetings are devised and planned to achieve points 1 and 2 above. In 2021, a total of 95 inspections were concluded across the operational RUs and the IM. Two audits were commenced in 2021 but were not concluded in the calendar year. During these supervision activities, when an opportunity arose, CRR Inspectors would highlight the need to 'move beyond compliance' and to encourage training and development in the field of human factors.

It was the CRR's intention to establish a sector working group on Human & Organisational Factors in 2021 to support efforts to improve the industry's capability in this area. Unfortunately, with COVID restrictions that were in place for much of 2021, it was decided to postpone this until 2022.

3.3.2 Monitoring of implementation status

The CRR reviews the implementation of the plan identified in Section 3.2.1 at a bi-weekly meeting at which all Supervision Inspectors attend. Activities allocated to individual Inspectors are discussed and their progress reviewed. Moreover, the wider CRR team meet monthly at which the Principal Inspector with responsibility for supervision provides an update as to work completed in the previous month and work in progress. Lastly the programme is reviewed annually in Quarter 4 at the supervision workshop. Items incomplete or unresolved are reviewed to determine if they should be carried forward to the next year or if they are still valid/a cause for concern.

3.4 Safety organisational context

The CRR continued to receive the majority of its funding through the annual levy that the CRR places on the entities that are subject to regulation, as allowed for in the legislation establishing the CRR. The levy is allocated on the basis of the level of activity relating to the functions the CRR engages in with each regulated entity including certification, authorisation and supervision in that year. The balance was received as Grant-in-Aid from the Department of Transport.

3.4.1 Railway organisational context in the Member State and main changes

The organisational context in MS IE remained constant and there were no main changes. However, 2021 saw the continued impact of COVID-19, specifically in relation to restrictions on capacity imposed for public health reasons.

The railway network in Ireland is managed by the IÉ-IM and comprises approximately of 2,400 km of railway track, of which approximately 1,660 km is currently active, and includes 1471 passenger stations and 372 platforms. It also comprises of 5,100 bridges, 909 level crossings, over 4,900 cuttings and embankments and 14 tunnels. The railway is mainly single track, with 886km of double track and 60km of multiple track. The network includes main lines, suburban and commuter passenger routes, together with freight-only routes. Most of the network is comprised of radial lines focused on the capital, Dublin. The network largely provides for inter-urban connections providing strategic transport links at the national level between the six key cities on the island, Dublin, Cork, Galway, Limerick, Waterford and Belfast.

Intra-urban rail is also extensive within the Dublin area with the provision of DART in 1984 on the main network providing the core high-capacity network that is central to the Greater Dublin Area's mass transit system. Passenger transport and freight services are provided on the network by IÉ-RU. In addition, Northern Irish Railways (NIR) also operate a joint (the 'Enterprise') service with IÉ-RU between Dublin and Belfast as well as operating its own event based special service between Belfast and Dublin.

It is obviously the case that passenger numbers continued to be significantly lower in 2021 in a similar manner to that throughout Europe, due to limitations on public transport capacity implemented due to COVID-19. However, all rail services continued to operate all be it at a reduced capacity.

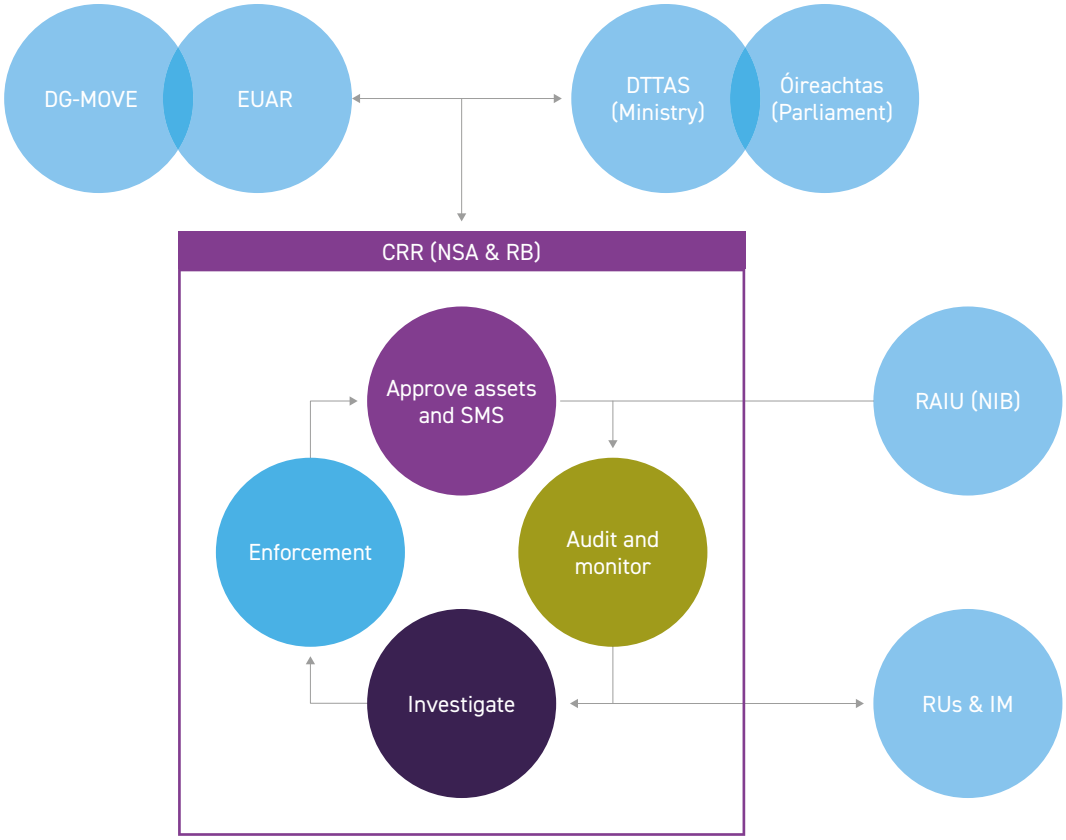
Ireland's National Development Plan 2018-2027 points to significant investment in the railway system in the coming years which includes further electrification of the conventional railway, new stations, elimination of level crossings, new rolling stock and development of a new metro system for Dublin. Engagement with the CRR continued on a number of these developments in 2021.

3.4.2 Information relating to the NSA organisation and main changes

The organisational structure of the CRR is shown in Figure 1, with a corresponding diagram indicating CRR workflow and relationships in Figure 2.

Figure 1
Staffing of the CRR at end of year 2021

Figure 2
Organogram of independent CRR organisation and primary workflows



3.4.3 NSA staff and the NSA competence management system

(Only staff dealing with railways is included), with a focus on staff dealing with the following activities: issuing Single Safety Certificate, Vehicle Authorisation, Supervision and Train Driver's licenses)

The following sections summarise how competence is managed for NSA staff.

3.4.3.1 Single Safety Certificate

The process for delivering safety certificates and safety authorisations is described in RSC-G-030 'Application Guide for Single Safety Certificates, Safety Authorisations and Safety Management Certificates' and it was published in December 2021. One NSA inspector attended the pool of expert training at ERA on single safety certification. Other inspectors who work on safety certification/authorisation work closely with their line manager on their first project. During a project a number of internal NSA meetings take place to discuss content of an application and to maintain a common approach for all applications.

The CRR will implement a competence management system for this process during 2022. All NSA inspectors have been offered the opportunity to complete the MSc course in the University of Birmingham titled 'MSc in Railway Systems Engineering & Integration'. The NSA also has a performance management development system in place where training needs are identified and an annual budget for training purposes exists.

3.4.3.2 Vehicle authorisation

The process for vehicle authorisation is described in RSC-G-009 'Guidance on Application for Authorisation and Application for Acceptance for Heavy Rail Fixed Installations and Vehicles', which was published in February 2021. NSA inspectors who work on vehicle authorisation projects have attended the pool of expert training at ERA. Bespoke training for NSA inspectors on vehicle authorisation is made available as a need is identified. Additional expert advice is contracted by the NSA as necessary.

The CRR will implement a competence management system for this during 2022. All NSA inspectors have been offered the opportunity to complete the MSc course in the University of Birmingham titled 'MSc in Railway Systems Engineering & Integration'. The NSA also has a performance management development system in place where training needs are identified and an annual budget for training purposes exists.

3.4.3.3 Supervision

As stated previously the principal activities undertaken by CRR Supervision Inspectors are audits, inspections and meetings.

While the CRR does not yet have a formal competence management system, it is to be implemented in 2022. All Inspectors are degree qualified engineers, many being of chartered status. All Inspectors receive induction training together with all the necessary railway safety competences required to access the various railways we supervise. In 2021, 2 new Inspectors joined the CRR in the Supervision Team. The new Inspectors received a comprehensive induction involving numerous sessions with senior staff, meetings with stakeholders and formal classroom-based learning/courses.

Prior to undertaking any activity there is also a period of on-the-job learning where more junior inspectors are mentored by more experienced staff. This includes acting in a support role on audits, shadowing Inspectors as they carry out asset/task observation inspections. In the case of auditing, this is supported by formal, classroom-based Lead Auditor training which all Inspectors receive.

CRR Inspectors are encouraged to maintain their own continuous professional development and are all offered the opportunity to complete a relevant MSc course such as the 'MSc in Railway Systems Engineering & Integration' in the University of Birmingham. Two Supervision Inspectors who joined the CRR in 2020 commenced an MSc in Railway Safety and Control Systems run jointly by the University of Birmingham and University of York in 2021.

The Principal Inspector with responsibility for Supervision has an annual budget allocation per Inspector reporting to him to be used at the discretion of the Principal Inspector for training purposes.

Inspector reports are always peer reviewed and feedback given when necessary. Moreover, Inspector performance is reviewed twice per year as per the CRR Performance Management and Development System.

3.4.3.4 Train driver licences

The requirements for issuing train driver licences are detailed in RSC-G-025, sections 9, 10 and 11. The administrator at the NSA has been trained in these requirements. The principal inspector checks that all requirements are met before train driver licences are issued.

In 2021, a number of supervision inspections were undertaken checking train drivers licences and their complementary certificates, and a number of non-compliances were identified that are discussed further in section 6.4.

4 Safety performance

Reference to requirement: art. 19 (a) of Directive (EU) 2016/798

4.1 Statistics and analysis of general safety performance trends

This chapter uses the CSIs and national safety indicators when considering the reasons and context behind recent safety developments. National safety indicators are shown in the CRR's Annual Railway Safety Performance report which is published separately. The infrastructure manager has in recent years modernised their occurrence reporting and data collection systems in part to ensure that CSI and national indicators are collected by the Infrastructure Manager and all Railway Undertakings operating the national railway system. NSA-IE has reviewed the system and believes it to be effective for the purposes of indicator reporting, where technical experts in RU's and in the IM review data continually for each occurrence to verify accuracy and completeness.

The Irish network accounts for a small proportion of total EU railway traffic. In 2021, 870 million passenger-km was reported, along with 74 million tonne-km for freight services. For context, the last available figures for the EU as a whole were about 220 billion passenger-km and 370 billion tonne-km respectively. Whilst these figures are taken from a period when mobility was reduced due to COVID-19, the proportions are broadly in line with other years. The Irish system is predominantly used for transport of people, but following a long period of decline, it is now expected freight services will expand due to their efficiency and due to proposed plans to improve connectivity to ports in Ireland.

Ireland continues to have relatively low accident rates per million train-km. Although it is difficult to pick up on significant trends within the CSI data as the values are very small, there has been an underlying decline in the five-year rolling average number of reported significant accidents. One significant accident was recorded for 2021, which is one more than 2020 but continues a broadly positive trend since CSI's were introduced. It is observed from the agency's latest report on Railway Safety and Interoperability in the EU that Ireland is towards the more positive side of comparative data for railway fatality rates in Europe. The overall picture of safety in the rail industry is a good one, with most indicators trending positively.

The Common Safety Indicators (CSIs) for Ireland are provided to European Union Agency for Railways (ERA) using the agency's designated reporting template. The following is an analysis of trends related to CSIs and national safety indicators.

4.2 Number of fatalities/serious injuries (total and relative to train-km)

One fatal accident was reported in early 2021. A person walked from the platform onto the track in Dublin City Centre without permission and was reported to have been struck by a train. The Dublin Coroner issued a verdict of 'death by misadventure'. Two railway workers were seriously injured during infrastructure maintenance tasks where road rail vehicles were involved. The three occurrences were reviewed by the NSA and no significant compliance gaps were observed. 4 instances of fatal self-harm occurrences were recorded for 2021, and similarly no compliance gaps were noted in respect of the involved railway organisations.

The Irish network continues to have a satisfactory performance relative to other European national networks, although it is recognised that there is always scope for improvement, and that the performance measures can quickly turn negative within a small railway system.

4.3 Number of significant accidents (total and relative to train-km)

One significant accident occurred, as described in 4.1.2. Good performance for this category continues in 2021, but it is noted that there is always potential for occurrences to evolve into significant accidents if circumstances were slightly altered.

4.4 Overview of safety incidents (CSI precursors to accidents and nationally used accidents)

The total number of precursors is down again in 2021 to 11, from 12 in 2020 and 28 in 2019. A primary factor in the downward trend is an error in interpreting the definition for this category that is stated in ERA document ERA-GUI-02-2015 'Implementation Guidance For CSI'. Involved railway organisations overestimated the number of Wrong Side Failures as they included incidents where track circuits did not operate due to contamination, which was mostly in Autumn. This definition was corrected for 2021 data and an inspection is underway in 2022 to assess the effectiveness of systems in place for collecting CSI data. Signals passed at danger continued a good trend for 2021 with 8 in total versus 10 in total for 2022. The CRR reviewed systems for assessing SPAD risk in 2021. There were no significant compliance gaps observed. The inspection referenced above is also checking this data category to ensure collection systems are effective.

Figure 3
Railway undertaking overspeed 2021

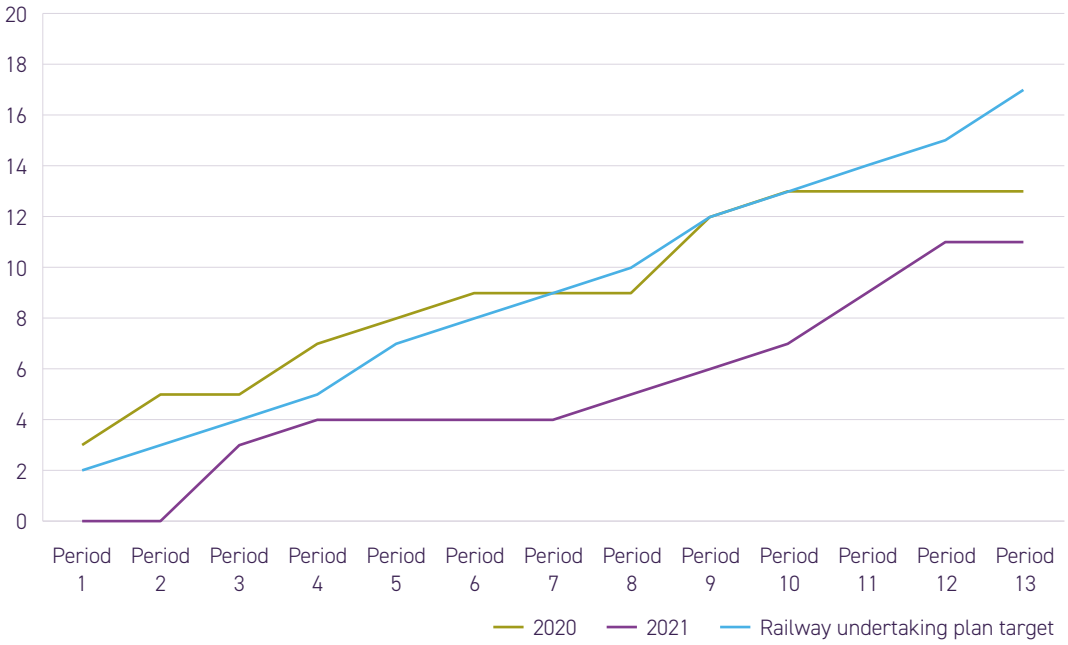


Figure 3 shows a national indicator collected for overspeed of trains. The railway system contains detection technology for such events that identifies potential events which are then subsequently investigated. 2021 continued the good performance from 2020, in 2019 23 such events were recorded meaning 2021 results are a significant improvement. Causation for this result is unclear but it is likely causal factors for these incidents are associated with the limits of human performance and a human's ability to perform repetitive tasks. It is known internationally that the primary mitigation for such occurrences is continuous speed supervision, and in Ireland work is continuing to update the legacy train control system to conform with ETCS requirements.

4.5 Overview of safety outputs CSIs, such as level-crossing per type, ATP statistics and other nationally used metrics

The infrastructure remained in the main at steady state in Ireland in 2021, where there continues to be a significant focus on asset renewals and planning for large projects to replace existing signalling and energy systems. The infrastructure manager has changed level crossing designation in several categories. This is primarily due to the installation of a new system which provides road users with advice on the presence of an oncoming train. Crossings with user side protection increased from 3 in 2020 to 23 in 2021 as a result.

4.6 Analysis of trends for main safety outcomes per category of accident and user type, safety incidents, safety outputs

As previously indicated, determining trends from CSI data in Ireland can be difficult due to the relatively small values reported for Ireland. However, it has been observed that here has been an increase in collisions between trains and large animals, mainly deer, where the number is rising meaningfully since 2019. Incidents involving deer is a principal area of concern in Ireland that has emerged from monitoring of national indicators. The wild deer herd in Ireland has grown substantially in recent years, and some railway lines are located in areas where that herd is most prominent. Deer struck by a train may cause damage to a train and effect safety critical components onboard, deer may also damage fixed infrastructure such as signage or level crossing components. Figures 4, 5 and 6 below give some insight into the problem. The primary mitigation to minimise the risk from the intrusion of deer is the erection of deer fencing and a programme to do this is carried out on an annual basis. The IM has engaged with the Irish Deer Commission and are sharing data on deer strikes with them as part of an overall national study that they are undertaking. Access to the information from this study is expected to enhance risk management associated with deer adjacent to the railway. The engagement with the Irish Deer Commission has also afforded more learning on deer behaviour, which may inform the choice of further risk controls.

Figure 4
All train collisions

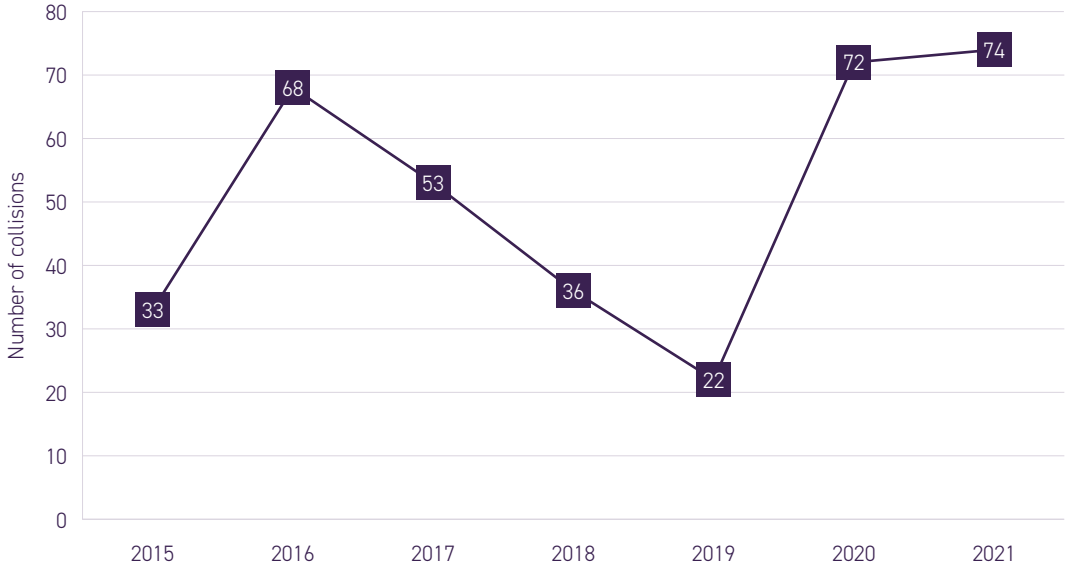


Figure 5
Train collisions with large animals

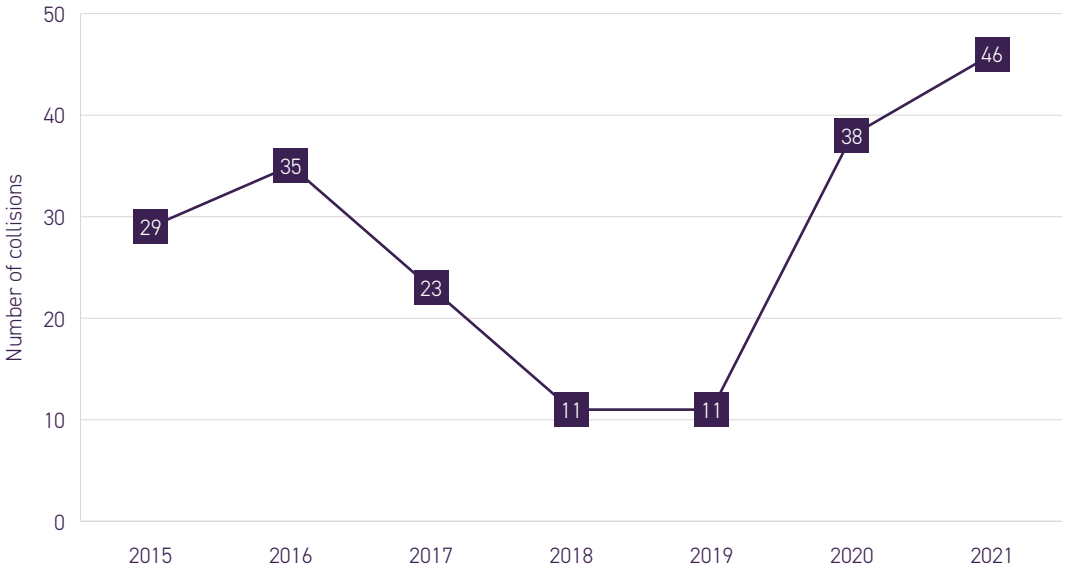
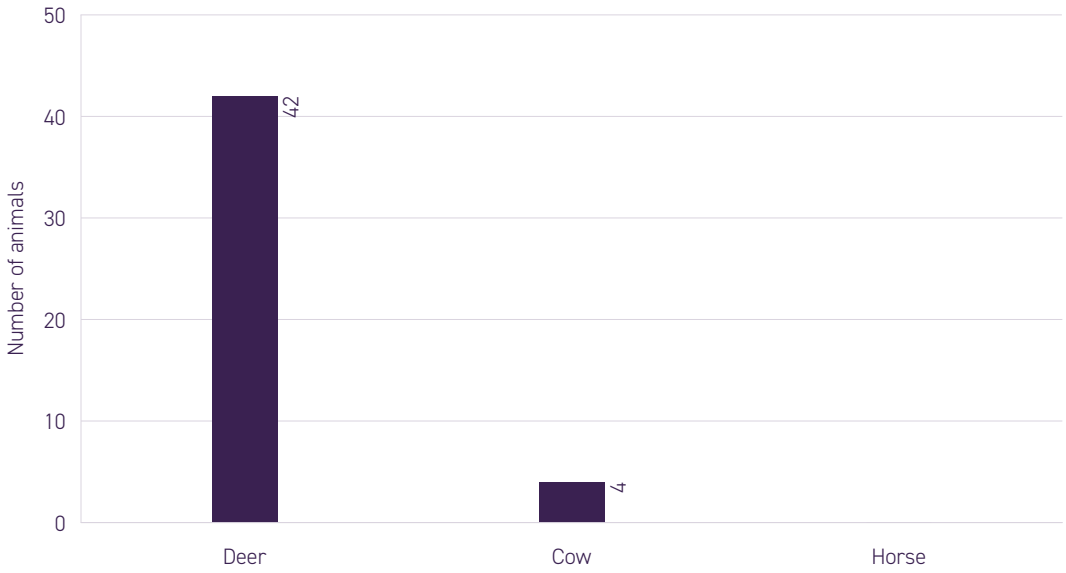


Figure 6
Train collision with animal by type



The CRR reviews the impact of these collisions through immediate notification of incidents where there are fatalities, serious injuries or another significant risk manifests. These incidents are also reviewed periodically with involved railway organisations.

4.7 Provide information on national safety targets and underlying safety improvement plans.

Ireland currently does not define targets at a national level through legal mechanisms. This may evolve with the implementation of the fourth railway package.

5 EU legislation and regulation

Reference to requirement: art. 19 (b) of Directive (EU) 2016/798 and art. 19 (e) of Directive (EU) 2016/798

5.1 Changes in legislation and regulations

5.1.1 Important changes in the implementation of the EU legal framework

(e.g., RSD, IOD, other relevant Directives, Regulation and Secondary legislation, including the change in the scope)

Not required in 2021.

5.1.2 Eventual amendments necessary in order to achieve CSTs

(art. 4(1) point f, art. 7(7) of the Directive (EU) 2016/798)

Not required in 2021.

5.1.3 Review of the operational companies' implementation of new EU regulatory framework

(Concerning rolling stock, infrastructure, staff performing safety-critical tasks, staff competencies and training)

Not required in 2021.

5.1.4 Changes in legislation/regulation following the recommendations and opinions of the Agency pursuant to RSD

(art. 32 of the Directive (EU) 2016/798 and art. 13 of the Regulation EU 2016/796)

Not required in 2021.

5.1.5 Changes in legislation/regulation following the NIB safety recommendation

(art. 26(2) of the Directive (EU) 2016/798)

Not required in 2021.

5.1.6 Changes/amendments to the national legal framework relating to railway safety

(Legal acts and administrative regulations)

The following Statutory Instruments were published in 2020:

— S.I. No. 177/2021 – European Union (Transport of Dangerous Goods by Rail) (Amendment) Regulations 2021.

— S.I. No. 176/2021 – European Union (Interoperability of the Rail System) (Designated Bodies) (Fees) Regulations 2021.

5.2 Derogation from RSD system of certification of ECM

5.2.1 Derogations decided in accordance with Article 15 Directive (EU) 2016/798

(Derogations from the system of certification of Entities in Charge of Maintenance (ECM))

No derogations.

5.2.2 Information according to art. 15(3) of the Directive (EU) 2016/798

No derogations.

6 Safety Certifications, Safety Authorisations and other certificates issued by the NSA

Reference to requirement: art. 16 of the Directive (EU) 2016/798, art. 19 (c) of the Directive (EU) 2016/798, art. 24 of the Directive (EU) 2016/797, art.7 of the Commission Regulation No 445/2011, art.14 of the Directive 2007/59/EC and art. 20 of the Directive 2007/59/EC)

6.1 Safety Single Certificates and Safety Authorisations

6.1.1 Status and changes to the number and awardees of safety certificates and safety Changes to strategy and procedure related to the process of issuing Safety Single Certificate/Safety Authorisation

Status	Change	Number
Number and awardees (names of the companies) of new safety certificates	Rhomberg Sersa Ireland Ltd – Parts A and B	0
Number and awardees of renewed safety certificates	Balfour Beatty Ireland Ltd – Parts A and B* Railway Preservation Society of Ireland – Parts A and B	0
Number and awardees of amended safety certificates (e.g., for extensions or reductions in scope…) and main issues faced		0
Number of revoked safety certificates and main reasons	Balfour Beatty Ireland Ltd – Parts A and B*	0
Number and awardees of new safety authorisations,		0
Number and awardees of renewed safety authorisations		0
Number and awardees of amended safety authorisations (e.g., for extensions or reductions in scope…) and main issues faced		0

*Revoked because the company is no longer operating in Ireland

6.1.2 Outcomes of discussions of supervision results with other NSAs in the context of certification/authorisation

There was no activity.

6.1.3 Changes to strategy and procedure (shall only be included if relevant) related to the process of issuing Safety Single Certificate/Safety Authorisation

In the area of acceptance of safety management systems, CRR-G-030-B, which provides guidance on applying for a single safety certificate, a safety authorisation or a safety management certificate was published in December.

6.2 Vehicle Authorisations

6.2.1 Status of the number and awardees of Vehicles Authorisations (VA) during the reporting year

e.g., Number and awardees of new issued VA, Number and awardees of modified and/or renewed VA and main issues faced. Number of suspended VA and main reasons. Number of withdrawn VA and main reasons]

Status	Change	Number
Number and awardees of new issued VA	Iarnród Éireann	0
Number and awardees of modified and/or renewed VA and main issues faced		0
Number of suspended VA and main reasons		0
Number of withdrawn VA and main reasons]		0

6.2.2 Changes to strategy and procedure related to the process of Vehicle Authorisation

CRR-G-009-G, Guidance on Application for Authorisation and Application for Acceptance for Heavy Rail Fixed Installations and Vehicles was published in February. It gives guidance and explanation on the European and Irish legal requirements for authorisation of fixed installations and vehicles.

6.3 Entities in Charge of Maintenance (ECM)

The CRR in its role as a certification body for ECM, reports as follows:

6.3.1 Certificates issued, amended, renewed, suspended, and revoked during the reporting year

None.

6.3.2 In case of suspended or revoked certification please describe the main causes/reasons

None.

6.3.3 Report of non-conformities which have been detected by the NSA during its surveillance activities

None.

6.3.4 Changes to strategy and procedure related to the process of ECM certification

None.

6.4 Train drivers

6.4.1 Train driver licenses issued, amended, renewed, suspended, withdrawn during the reporting year (Directive 2007/59/EC, Art.14)

There were 35 licences issued by the NSA in 2021. There were no licences amended, renewed, suspended or withdrawn.

6.4.2 Training centres recognized during the reporting year (Directive 2007/59/EC, Art.20 and Art.23(6))

There was no activity.

6.4.3 Changes to strategy and procedure related to the process of train driver licensing

There was no activity.

6.5 Other type of authorisation/certifications

6.5.1 Cases where NSA acts as certification body for other type of railway authorisations/certification

As recognition body for Designated Bodies (DeBoS) for the IE network the CRR worked on the first application for recognition during 2021. An IE DeBo recognition certificate was issued in January 2022.

One Certificate was issued by the NSA when acting as Designated Body for the INF Subsystem. One Authorisation for Placing in Service of a Fixed Installation for the CCT Subsystem was issued by the NSA.

6.6 Contacts with other National Safety Authorities

6.6.1 Cooperation with foreign safety authorities

In 2021, the main route of engagement with other NSA's was through the NSA Network.

6.6.2 Outcomes of discussions of supervision results with other NSAs

In terms of Supervision the CRR have an MoU with the Department for Infrastructure of Northern Ireland, but no meetings took place in 2021, nor was there any issues that needed to be alerted to/ discussed with them in 2021.

The CRR attended 3 remotely held ILGGRI meetings in 2021. Topics discussed included proposed new CSMs, especially CSM ASLP, the Great Belt Bridge Accident and the NSAs response to it, vehicle registers, the One Stop Shop, and other arrangements associated with implementation of the fourth railway package.

6.7 Exchange of information between NSA and railway operators

6.7.1 Exchange of information between the NSA and RU/IM

(describing the scope, the frequency and how the exchange is done)

On a quarterly basis CRR Inspectors meet with company executives from the larger RUs and the IM. The purpose of these meetings is to primarily review their safety performance, discussing accidents and incidents, pre-cursors, and internal monitoring.

These meetings are also used to provide updates on all relevant European matters such as legislative changes, new CSMs, consultations and new European initiatives. They afford the opportunity to the railway organisations to ask questions and to request further information on specific points. The CRR endeavours to respond at the meetings but also to provide supporting information and links afterwards.

6.7.2 Topics/critical points exchanges/discussed for the reporting year

There was no activity.

6.7.3 Relating findings and initiatives

There was no activity.

7 Supervision

(Reference to requirement: art. 19 (d) of Directive (EU) 2016/798 and Commission Delegated Regulation EU 2018/761)

7.1 Strategy, plan, procedures and decision making

7.1.1 Supervision strategy, including how planning (e.g., data concerning CSIs, input from Safety Recommendations, etc.) takes this into account and any relevant changes made as a result of the analysis of safety data along with an explanation of why those changes were made

The CRR's Statement of Strategy, published in 2021 and covering the period 2021–2024 inclusive, is the high-level document that sets out the Commission's mandate, mission, vision and key priorities in the period. It forms the basis of the Commission's activity across all units, including the Supervision Section. These key priorities, from a supervision perspective, are areas of risk on which the CRR will pay particular attention during the life cycle of the strategy. These are identified based on our knowledge of trends in safety performance, previous audit/inspection findings, NIB safety recommendations and other sources. For the period 2021–2024, the CRR have identified 4 key areas, and these are:

- Track Worker Safety, given an increase in occurrences involving front line workers and contractors, in particular those operating road rail vehicles;
- Level Crossings safety, given recent occurrence, NIB safety recommendations and the IM introducing novel technology to assist level crossing users;
- Contractor management, linked to track worker safety, given the increasing prevalence of the use of external contractors for both labour and plant (machinery); and
- Control assurance & risk management, given the roll out of the 4th railway package and associated EU legislation.

Also identified in our Statement of Strategy are risks associated with Human Factors (HF), e.g., automation and the digitisation and digitalisation of our railways. Moreover, HF integration not only in systems/sub-systems but also into railway organisations SMSs is an area the CRR will focus on.

Taking the above into account, i.e., to address these areas of risk and to supervise the continued application and effectiveness of each RU and IM safety management system, the CRR prepares annual supervision plans for several RU's and the IM. For 2021, these included:

- Iarnród Éireann (IÉ-IM) – Infrastructure Manager.
- Iarnród Éireann (IÉ-RU) – Railway Undertaking.
- Rhomberg Sersa Rail Group (Ireland) – Railway Undertaking.
- Railway Preservation Society of Ireland (RPSI)– Railway Undertaking.
- Northern Ireland Railways (Translink) – Railway Undertaking.

Each railway organisation's supervision plan that the CRR develop include audits, inspections and meetings with senior managers.

These plans are developed by the CRR Inspectors at an annual workshop where the safety performance of each individual railway organisation supervised is discussed. This involves reviewing key safety performance data many of which would be categories of CSI. Then depending on their performance, i.e., is it an improving or worsening trend the level of activity can increase or decrease.

Additionally, in terms of a plan's execution, activities are prioritised based on risk meaning those railway organisations that have a greater exposure to risk can expect more engagement with the CRR than those organisations with limited exposure.

With regards to the Infrastructure Manager, in 2021, the CRR sought to focus on the inspection and maintenance of infrastructure assets, the management of lineside and on-asset vegetation. On the state railway undertaking the CRR undertook a detailed audit on the Training and competence of Train drivers, reviewed the processes in relation to 'persons of reduced mobility' (PRM) and undertook inspections of train depots.

On the sole On-Track-Machine RU the CRR conducted a number of inspections that looked at Route Knowledge and machine competence, train driver licences and an inspection of the maintenance facility.

The global risks of the railway system in the Member State are principally known via the Infrastructure Manager's Network Wide Risk Model which they endeavour to update and rerun every 2-3 years. It should be noted that a re-run only commenced in 2021 and updated information is not expected until early 2022.

The IM defines global risks into 3 categories. These are:

- Prime: accidents entirely within the state railway (RU and IM) control.
- Shared: accidents influenced both by the state railway (RU and IM) and the person who experiences the accident.
- Illegal: accidents where the person who suffers the accident is acting illegally.

The principal risk areas, total risk and prime risk identified by the state railway undertaking and infrastructure manager are:

Top five highest risk areas

No.	By total risk	By prime risk
1	Platform-Train Interface	Derailment
2	Slips, trips and falls	Collision between train
3	Trespass/train surfing	Structural failure
4	Collision between train	Train/object collision
5	Derailment	Train/vehicle LX accident

The highest risks (Total Risks 1-4) are typically high-frequency, low-consequence events. That said, given the relative size of the Irish Railway Network the number of occurrences is small. Occurrence rates have been further skewed owing to the significant drop in passenger numbers in 2020 and 2021 owing to the COVID-19 pandemic and associated restrictions.

Prime risks, on the other hand, are typically those low-frequency, high-consequence events. However, the State RU and IM have suffered very few serious accidents in recent times.

As stated in earlier sections the CRR's supervision plans are developed on an annual basis. In 2021, the Supervision Team had one vacancy so it was still not quite at full strength. Additionally, face to face activity was still largely curtailed owing to COVID-19 restrictions in place for much of the year. Consequently, not all planned work was achieved.

In Q4 2020 the CRR were subject to audit by the ERA as part of the wider NSA Monitoring project. The CRR received the final audit report in June 2021 and two deficiencies were reported relating to the CRR Supervision Strategy. Specifically these were:

1. The ERA audit team considered that the supervision strategy was not risk based and did not set the high-level priorities for supervision. Moreover, the supervision strategy wasn't based on a holistic view of railway safety at system level.
2. There is no structured and formal review of the supervision strategy and the supervision tools (guideline, procedure, templates etc.).

To that end the CRR has commenced a number of tasks to remedy these deficiencies. These include:

— The adding of priorities (High, medium, low) to individual supervision tasks, i.e., all audits and planned inspections.

— The establishment of an MoU with the NIB.

— The establishment of a weekly meeting at which all reported accidents and incidents are discussed and next steps agreed, i.e., to minimise duplication of work undertaken by the NIB and railway organisations.

— The development of a discrete Supervision Strategy document, additional to the CRR Corporate Statement of Strategy, (work in progress).

It is envisaged that all tasks associated with the audit undertaken by the Agency on the CRR will be complete by March 2023. The CRR has provided a number of periodic updates to the ERA Lead Auditor providing evidence of action taken.

7.1.2 Decision-making criteria on how the NSA monitored, promoted and enforced compliance with the regulatory framework and the procedure for establishing those criteria

The CRR's supervision activities are based on perceived risk to the safety of passengers, staff and third parties. Safety performance data together with intelligence sources such as previous CRR supervision activities, accidents, incidents and dangerous occurrences, NIB reports etc. collected in the preceding year informs Inspectors of areas where their attention may be required and supports the development of the next year supervision plans.

RU's and the IM are assigned a risk profile based on their safety performance and those organisations with a higher risk profile can expect more supervision than better performing railway organisations.

When it comes to enforcement CRR Inspectors employ the 'risk gap' technique where they first assess the level(s) of actual risk arising from the railway organisation's activities. Inspectors base this judgement on information about hazards and risk control measures informed by their training, experience, knowledge of past incidents and accidents in the State or in other countries, guidance and other relevant sources of information.

Having identified the level(s) of actual risk the Inspector should identify the risk gap, i.e., is it minor, inadequate, absent or extreme. Depending upon the Inspectors judgement, together with a peer review, an enforcement action is taken.

To assist CRR Inspectors throughout the process guidance is available and internal discussion and challenge is encouraged amongst the team.

Relative to the national rail network, Section 76 of the RSA 2005, a request for Improvement Plan was used on 4 occasions in 2021. These were:

- An Improvement Plan was requested following an inspection of the On-Track-Machine RU's rolling stock maintenance. Gaps were identified relating to controlling and conducting rolling stock vehicle maintenance which the Inspector considered posed an unnecessary risk to the safety of persons.
- An Improvement Plan was requested following the identification of a major non-compliance during the audit of the state RU's management of Train Drivers. Specifically, this was in relation to the checking of Train Drivers fitness for duty at the start of their shift.
- An Improvement Plan was requested from an RU following a notifiable occurrence relating to a door fault onboard a Dublin to Belfast passenger service.
- An Improvement Plan was requested from IÉ-IM following a notifiable occurrence in which a contractor fell from an RRV bucket while it was moving in an engineering possession.

7.1.3 Main complaints submitted by stakeholders (if any) on decisions taken during supervision activities and the replies given by the NSA. If there is a negative return this should be recorded.

Following a supervision activity, be that an audit, inspection or meeting draft reports/minutes are issued for comment to the relevant organisation. The applicable organisation is encouraged to raise any concerns they have and identify any factual inaccuracies that may have been made. These are formally recorded and then responded to by the lead Inspector. In most cases issues are resolved prior to the finalisation of the report/minutes, however, if there are diverging views these are recorded in the report together with CRR reasoning for its decision.

No formal complaints were raised by stakeholders regarding decisions taken during supervision activities or on the replies given by the NSA to any comments or queries raised by CRR Inspectors in 2021.

7.1.4 Any changes to the regulatory regime in the member state with impact on supervision strategy, plan or decision making

Nil.

7.2 Supervision results

7.2.1 Number and outcome of inspections and audits carried out during the reporting year

In 2021, CRR inspectors concluded a total of 95 Inspections broken down as follows:

- IÉ-IM 63 Inspections.
- IÉ-RU 23 Inspections.
- NIR 1 Inspection.
- RPSI 4 Inspections.
- RSIE 4 Inspections.

These inspections included sample checks on infrastructure assets, depots, train driver licences, train operations and rolling stock maintenance activities etc. These inspections resulted in a multitude of outcomes ranging from 'scope for improvement' where action is determined by the railway organisation to 'minor non-compliance' where evidence is sought by CRR inspectors to see that action has been taken.

With regards to audits, these were fewer in number given the greater resource requirement for such activities and the fact that on-site face-to-face activities remained curtailed for much of 2021. The following table lists those audits commenced in 2021.

CRR Audits initiated in 2021 but not finalised

Railway organisation	Title of audit
IÉ-RU	CSM 1169/2010 Annex II – Criterion N – Focusing on Train Driver Training & Competence
IÉ-IM	CSM 1169/2010 Annex II – Criterion A, N, O, P – Focusing on the Civil Engineering Department

7.2.2 Results of and experience related to the supervision such as how many visits required remedial work from the supervised entity

As previously stated, above a total of 95 inspections concluded in 2021 across all Heavy Rail Organisations. There continued to be a focus on level crossings and stations, but other topics were inspected such as Driver Booking On Points, Hazard Report procedures, rail-wheel maintenance processes, vegetation management etc.

A total of 107 outcomes (recommendations) were made in 30 of these inspections.

Key findings included:

- Clearing vegetation obscuring the safe height warning sign on road approaches to under-bridges.
- Gaps in the management of OTM fleet risks.
- Sporadic gaps in the management of rolling stock concessions.
- The importance of recording hazards and their mitigations, close out, Close Calls.
- The absence in identifying Wheelchair Boarding Aid Operational Zones in compliance with PRM TSI section 4.4.1.

Actions have or are being taken by the relevant railway organisation to address issues found and CRR Inspectors actively follow up with the companies to ensure this is being done.

The CRR concluded 42 Post Occurrence Activities in 2021, resulting in 50 outcomes being identified. Weak conformity with operational rules by staff was noted to be a common concern in these activities.

7.2.3 Supervision results by topic of supervision, including supervision of training centres and transport of dangerous goods

The Iarnród Éireann training centre was the subject of an inspection in 2021. This was incorporated into a wider inspection that was checking the application and effectiveness of IÉ-RU's Train Driver Licence and Complementary Certification process. No non-compliances were detected, however, 3 areas where action was considered necessary by the CRR Inspector were identified. These were in relation to:

1. Trainers continuing professional development;
2. The notification of changes to infrastructure or rolling stock to the training school; and
3. The content and issuing of Training Records.

In terms of dangerous goods, no specific supervision activity was conducted in 2021.

7.2.4 Supervision results of the correct application by RUs/IMs and effectiveness of all processes and procedures in the management system according to Regulation (EU) 1078/2012[1]

All RUs and the State IM have an approved SMS that includes adequate internal audit standards to monitor the correct application and the effectiveness of their SMS. The CRR meets quarterly with the larger RUs and the IM to review their safety performance in the preceding quarter. A standing item on the agenda at these meetings is to review their progress against their own internal audit/inspection plans, finding and outcomes from these and any actions being taken to address issues found.

Similarly, following accidents and incidents railway organisations must conduct robust investigations to determine immediate, underlying and root causes. Action plans must be put in place and these are sampled by CRR Inspectors to see what actions have been taken.

As stated above there were several dangerous occurrences which essentially arose due to staff violating rules. The relevant railway organisations were recommended to increase their own levels of internal monitoring and it has been reported to the CRR that there has been an increase in Safety Tours by management personnel.

7.2.5 In relation to the implementation of the 4th railway package, the supervision results for closing out the 'type 3 issues' raised during the single safety certification of the SMS by from either ERA or the NSAs for the areas of use

No work was undertaken in this area owing to Ireland deferring transposition of the interoperability and safety directives until 2020. The first railway organisation SMS to be certified under the new CSM 762/2018 is not expected until 2022.

7.2.6 Evidence obtained in supervision activities, when an ECM is not compliant

No activity undertaken in this area in 2021 hence no such evidence obtained.

1. Art 1 2(a) to check the correct application and the effectiveness of all the processes and procedures in the management system, including the technical, operational and organisational risk control measures.

7.2.7 Comments on the success of the SMSs in controlling risks

During the course of CRR supervision activities Inspectors in addition to checking compliance with standards, also check for areas of 'good practice'. The CRR defines 'good practice' as an area highlighted which, in the opinion of the CRR Inspector/Auditor, is good practice within the industry.

Good practice was cited in four discrete inspections undertaken in 2021. These were in relation to:

- Managing PRM and specifically the recording of accessibility requests and the recording that assistance measures have been arranged.
- Managing Train Driver competency by aligning route knowledge expiry dates with complementary certificates.
- The introduction and use of mobile technology to assist in asset management and reduce office administration time.
- Recording Train driver Hazard Reports in an easily assessable database, promoting transparency and facilities identifying repeated incidents/issues.

7.2.8 Any specific interventions with the operational companies on specific topics, why these took place and results

Of concern were several occurrences, involving Iarnród Éireann employees and contractors, that under slightly different conditions could have also resulted in loss of life, these included:

- A contractor working under the direction of an Iarnród Éireann Supervisor fell from a Road Rail Vehicle Bucket as it transited to a worksite.
- A member of Iarnród Éireann Track Engineering staff narrowly avoided being hit by a moving train as they were recording rail temperatures.
- A train collided with track maintenance equipment and narrowly avoided hitting several engineering staff.
- The overturning of a Road Rail Vehicle in an engineering possession.

Several of the above occurrences are solely due to safety rules not being adhered to by staff. In two of the above instances the CRR used its enforcement powers (requesting an Improvement Plan in accordance with s. 76 of the Railway Safety Act 2005, as amended) to bring about improvements in safety. CRR Inspectors continue to engage with sector organisations on these issues.

7.3 Coordination and cooperation

7.3.1 Outcomes of discussions of supervision results with other NSAs

The CRR has a memorandum of understanding (MoU) with the Department for Infrastructure (DfI), the NSA in Northern Ireland. There was no cause for contact with the DfI in 2021.

Additionally, the CRR consulted with numerous other NSA's regarding their role in terms of investigating accidents. This was in the form of a survey. This activity was prompted following the Agency's audit of the CRR as part of the NSA Monitoring cycle. The ERA Audit Team considered that our investigating accidents and incidents was a duplication of effort given investigating accidents and incidents is the function of RUs, IMs and the NIB. Several responses were received from other NSAs which did not indicate that the CRR was an outlier in terms of its activities. Nonetheless, the CRR committed to review its practice of undertaking post occurrence inspections.

8 Application of relevant CSMs by RUs and IMs

Reference to requirement: art. 19 (f) of Directive (EU) 2016/798

8.1 Application of the CSM on Safety Management System

8.1.1 Analysis of the application of the CSM on SMS by RUs and IMs

[e.g., if through an evaluation of the EMM the NSA identifies for RUs and IMs the need of specific training to develop Safety culture and/or address Human and Organisational Factors]

There is no relevant experience of this as this CSM has not yet been applied in Ireland. Application is expected in 2022.

8.2 Application of the CSM for Risk Evaluation and Assessment

8.2.1 The changes of the sector maturity with the understanding of the CSM, and the increase or the decrease of its application

Application of this CSM has remained broadly consistent amongst the sector in Ireland. The method for assessing 'significance' of a change within the CSM provides for variations in how the regulation is interpreted by an RU/IM, and as such places a reliance on the management maturity of an RU/IM. No variations in management maturity levels have been observed but work is ongoing within the NSA to continuously improve the method for assessing maturity. The following projects were identified as significant in 2021:

- ETCS Level 1 Train Protection System – Trackside National Rollout.
- DART+ Coastal North.
- DART+ Southwest.
- Dublin City Centre Re-signalling Phase 2, 3 & 4.
- New Track Recording Vehicle.
- Class 22000 ICDMU – 41 B2 Cars.
- DART+ EMU Depot.

The CRR has involvement with each project with the exception DART+ EMU Depot.

8.2.2 The differences of experience and application between big and small companies, newcomer and incumbent railway companies, RUs, IMs and ECMs

The quality of application of the CSM by big and small companies is not noted to be substantially different in Ireland in 2021. One minor observation is that small companies apply the regulation less frequently and typically to projects of smaller scale.

8.2.3 The differences in the assessment of technical, operational and organisational changes, including the actor who plays the role of CSM assessment body for operational and organisational changes

Technical and operational changes tend be grounded in standardisation and technical rules, where use of explicit risk estimation methods is restricted to when codes of practice are not deemed practicable or applicable. Assessment of organisational change is heavily reliant on qualitative risk assessment and is difficult to standardise using a code of practice approach.

8.2.4 Coordination (or lack of) with the actors involved in the change/project for a joint identification and joint management of the risks shared across the interfaces between them, including the way the relevant information is exchanged between them

Experience of management of interface risks during a change project is generally good. As the system in Ireland is not large and SMS's are quite integrated, the number of interfaces is not considered substantial.

8.2.5 Availability in the companies of sufficient qualified and competent resources in the risk assessment and risk management fields

Objectively assessing if relevant practitioners within companies are qualified is a difficult task as NSA-IE has observed some difficulty in interpreting competence management requirements in CSM-CA and CSM SMS; railway organisations have worked together in Ireland to develop competence management guidance and this requirement is currently being implemented.
In practical terms, it is generally noted that most projects have a safety and compliance expert involved who generally ensures the project meets relevant SMS and legal requirements.

8.2.6 Combined use of the CSM for risk assessment and CSM for monitoring for a proactive and controlled management of changes, including the identification of information for the monitoring during the operation and maintenance of the railway system and the effectiveness of predictive measures from risk assessments

CSM MON is observed to be embedded in the SMS's in the sector in Ireland, the Plan-Do-Check-Act cycle is accepted as an important principle for safety management. CSM MON is typically applied automatically following a project where CSM REA is relevant. Significant projects in Ireland are expected to embed monitoring systems to check the safety of the change at all points in lifecycle of the system being changed. When the CSM REA process is concluded, risk assessments are required to be embedded into the register of risk for that company; the effectiveness of how this is done in practice is uneven, however. It is expected that enhanced guidance emanating from the latest SMS requirements will clarify further what is expected of involved organisations.

8.2.7 The overall railway sector experience in the country, including the moment when the risk assessment is done (e.g., from the beginning or at the end) in the project and the quality of the risk assessment documentation (real proactive risk management or purely cosmetic paper work)

Projects assessed as significant typically have the NSA's APIS (Authorisation to Place In Service) process applied hence are subject to elevated scrutiny by NSA-IE. The experience is observed to be acceptable, and the quality of risk assessment is mostly adequate. Deficiencies have been observed in inspections and further improvement is considered possible.

8.2.8 The proper use of the concept of significant change or misuse of the concept to escape the obligation to appoint an independent CSM assessment body (lack of trust). In the second case what is the quality of the demonstration of a correct control of the risks arising from non-significant changes when Annex I of the CSM is not used by RUs, IMs and ECMs

The 'test' for significant change is considered to have numerous interpretations that are compliant hence there is little evidence of 'misuse' of the concept. A more precise definition of the concept would be helpful. Railway organisations in Ireland tend to apply the same basic safety principals to significant and non-significant projects, although the level of verification in significant projects is typically higher.

8.2.9 The most positive experience found with the use of the method and the main remaining problems

The most positive experience is the greater degree of standardisation that CSM REA has provided, and all primary problems have been discussed in previous sections.

8.2.10 In relation to the implementation of the 4th railway package, the actions for closing out the 'type 4 issues' raised during the single safety certification of the SMS by from either ERA or the NSAs for the areas of use

This part of the fourth railway package was not used in 2021, but is expected to be used in 2022.

8.3 Application of the CSM for monitoring

8.3.1 Any changes of the sector maturity with the understanding, correct application of the CSM, and improvement of documentary evidence

While the sector has matured considerably since the CSM was introduced, several occurrences in 2021 would suggest that additional internal monitoring is warranted in some organisations. The CRR has written to the state Infrastructure Manager on two occasions requesting:

- That they review their existing internal possession task/contractor monitoring regimes to check if they are delivering expected outcomes.
- That the IM take steps to understand why violations are being made and implement measures to prevent further violations of rules, through education, improved awareness of legal requirements of its staff and adequate internal monitoring of tasks.

8.3.2 How the companies set out the strategies, priorities and plans for monitoring activities among the following options

The following options were provided by the agency in the guidance for this report:

- Proactive monitoring as part of the SMS that checks the effectiveness of the SMS processes, procedures and risk control measures, based on priorities (i.e., areas of greatest risk); or
- Monitoring everything; or
- Proactive monitoring based on expertise and results from previous monitoring activities to identify what to monitor, but unclear links to SMS;
- Reactive monitoring strategy based on lessons learnt from accidents and incidents investigations in order to prevent similar occurrences.

Safety Strategies and plans are guided by a legal principle in Ireland that it is the general duty of an RU/IM to ensure, in so far as is reasonably practicable, the safety of persons during railway operation. As such, the approach to monitoring combines options a, c, and d. Option b is not used as it is accepted that it is not practical to continually monitor everything. For option a, the NSA requires annual plans to be produced and presented at the beginning of each year, where these plans are reviewed quarterly with the NSA. Options c and d are considered reactive but important to implement when unplanned or unexpected events occur. For example, RUs are expected to implement additional interim risk control measures in the event of vehicle fire whilst the cause of the fire is being determined.

8.3.3 In relation to the implementation of the 4th railway package, monitoring of the OPE TSI for any key issues that arise

No issues were observed or reported in the application of CSM MON to the implementation of the fourth railway package or OPE TSI.

8.3.4 Availability in the companies of sufficient qualified and competent resources in the risk assessment and risk management fields

Objectively assessing if relevant practitioners within companies are qualified is a difficult task as NSA-IE has observed some impediment in interpreting competence management requirements in CSM-CA; this issue is being addressed by a cross industry working group currently. In practical terms, it is generally noted that RU/IM's have a safety and compliance expert involved in managing safety who monitors conformance with SMS and legal requirements.

8.3.5 Any differences with respect to the monitoring of operational processes and procedures vs. organisational and technical risk control measures (e.g., effectiveness or quality of documentary evidence)

No major differences are observed as focus in the Irish sector is on monitoring the process used to ensure the safety of an asset/process rather than just the end result.

8.3.6 Any differences of experience and application between big and small companies, newcomer and incumbent railway companies, RUs, IMs and ECMs

None observed.

8.3.7 Proper coordination (or lack of) with other stakeholders (including the suppliers and sub-contractors) for monitoring the effectiveness of control measures for the risks shared across the interfaces, in particular reporting to manufacturers of defects and non-conformities or malfunctions of technical equipment

Processes for checking control of supplier of services and suppliers of components require improvement within the sector in Ireland. Several minor compliance issues have been observed where service providers are not properly assessed for competence and component suppliers do not always provide a product to the correct specification. NSA-IE has prioritised inspection of related compliance requirements.

8.3.8 Combined use of the CSM for risk assessment and CSM for monitoring for a proactive and controlled management of changes, including the identification of information for the monitoring during the operation and maintenance of the railway system the effectiveness of predictive measures from risk assessments

CSM MON is observed to be embedded in the SMS's in the sector in Ireland, the Plan-Do-Check-Act cycle is accepted as an important principle for safety management. CSM MON is typically applied automatically following a project where CSM REA is relevant. Significant projects in Ireland are expected to embed monitoring systems to check the safety of the change at all points in lifecycle of the system being changed. When CSM REA process is concluded, risk assessments are required to be embedded into the register of risk for that company; the effectiveness of how this is done in practice is uneven however, and NSA-IE is in discussion with regulated entities about how to further improve transfer of risk from the project to operation. Additional guidance on how to assess and transfer risk is one measure being considered

8.3.9 In relation to the implementation of the 4th railway package, the actions for closing out the 'type 4 issues' raised during the single safety certification of the SMS by from either ERA or the NSAs for the areas of use

There is no relevant experience of this as this CSM has not yet been applied in Ireland. Application is expected in 2022.

8.3.10 The sector perception of the CSM for monitoring on whether it is considered as a proactive tool protecting the company business and enabling to optimise the company costs and competitiveness or seen just as a legal obligation

The sector has not reported such concerns to the NSA regarding CSM MON. Discussion generally indicates its requirements are appropriate.

8.3.11 The use of results from monitoring by the company top management and middle management to identify the necessary action plans and review the monitoring strategy, priorities and plans

Top management in the sector are made aware of results from monitoring. There is some concern regarding how top management track the effectiveness of action plans; it has been observed that lagging indicators are the main measurement type applied, but this is not always the case as leading indicators are sometimes used.

8.3.12 The overall railway sector experience in the country with the method in using it proactively to prevent accidents and incidents, or just as purely cosmetic paper work

The experience of the regulation is good and is expected to improve further when the fourth railway package is implemented in Ireland.

8.3.13 Any areas for improvement

NSA-IE propose the agency develop a guide that shows CSM REA and CSM MON may be integrated, similar to the guideline 'Taking Safe Decisions' from the UK Railway Safety and Standards Body.

8.4 Participation and implementation of EU projects

No information available.

9 Safety culture

9.1 Safety culture evaluation and monitoring

9.1.1 Evaluation and monitoring of the development of safety culture at the national level

There was less face-to face engagement with railway organisations and their employees in recent years (2020-2021) owing to COVID-19 restrictions being in place. Consequently, evaluating and commenting on the development of safety culture at a national level is a difficult task.

As reported in our 2021 annual report the standard of accident investigation reports in some organisations has improved with causal factors and root causes looking beyond the individual.

The CRR understands that Iarnród Éireann (central services) has recruited at least one additional human factors specialist and are keen to bolster this small team in the future suggesting a recognition of human and organisational factors that would likely include safety culture.

9.1.2 Use of safety culture models or conceptual frameworks to support regulatory oversight of safety culture

While the CRR did not explicitly carry out a discrete safety culture activity in 2021, a CRR Inspector did attend and co-run a workshop on 'Influencing safety culture – how regulatory oversight can have a positive impact, at the Rail Safety Days event in Porto in November 2021'.

CRR inspectors are periodically reminded to record positive and negative markers/findings as part of our railway organisation picture building activity.

9.1.3 Evaluation method to oversee safety culture of RUs and IMs

The CRR do not have a formal evaluation method to oversee safety culture within the RUs and IM, rather Inspectors, through their engagement with those railway organisations by undertaking audits, inspections and meeting with company executives and others, investigating public/railway staff complaints, reviewing NIB and railway organisation reports are informed as to safety culture aspects of the railway organisation.

9.1.4 Summary of activities relating to safety culture included in the planning and execution of supervision and results of those activities

No dedicated safety culture activities were undertaken in 2021 other than attending the Rail Safety Days Event and co-running a Workshop. Implementation of the safety culture model has proved difficult, and was not helped by the fact that activity has been greatly curtained in recent years due to the COVID-19 pandemic.

9.2 Safety culture initiatives/projects

9.2.1 Initiatives/projects undertaken by the NSA or within the national sector which contribute to the development of a positive safety culture

Nothing to report.

9.2.2 If safety culture is a separate project for the NSA, description of the project carried out

Nothing to report.

9.2.3 Initiatives implemented within the NSA to improve its own safety culture

Nothing to report.

9.3 Safety culture communication

9.3.1 Communication activities to the public/stakeholders relating to the safety culture activities performed

See sections 9.1.2 to 9.1.4 inclusive.

10 Theme chapter

The activities of the NSA in Ireland have been described in Section 1–9, no other significant activities are completed.

11 Annex: progress with interoperability, 2021

Please provide the following information as it is at the 31st December of the reporting year.

Please refer to the Appendix for definitions.

1	**Lines excluded from the scope of IOP/SAF Directive (end of year)**	
1a	Length of lines excluded from the scope of application of the IOD Directive [km]	0
1b	Length of lines excluded from the scope of application of the SAF Directive [km]	0

Please provide the list of lines excluded:

2	**Length of new lines authorized by NSA (during the reporting year)**	
2a	Total length of lines [km]	0

3	**PRM adapted stations (end of year)**	
3a	PRM TSI compliant railway stations	1
3b	PRM TSI compliant railway stations – partial TSI compliance	8
3c	Accessible railway stations ('step-free' access to platforms)	115
3d	Other stations (i.e., where all or part of station is not 'step-free')	31

4	**Train driver licenses (end of year)**	
4a	Total number of valid European licenses issued in accordance with the TDD	702
4b	Number of newly issued European licenses (first issuance)	31

5	**Number of vehicles authorized under the interoperability Directive (EU) 2008/57 (during the reporting year)**	
5a	**First authorization – total**	**0**
5aa	Wagon	0
5ab	Locomotives	0
5ac	Hauled passenger vehicles	0
5ad	Fixed or pre-defined formation	0
5ae	Special vehicles	0
5b	**Additional authorization – total**	**0**
5ba	Wagon	0
5bb	Locomotives	0
5bc	Hauled passenger vehicles	0
5bd	Fixed or pre-defined formation	0
5be	Special vehicles	0

5	Number of vehicles authorized under the interoperability Directive (EU) 2008/57 (during the reporting year)	
5c	**Type authorization – total**	**0**
5ca	Wagon	0
5cb	Locomotives	0
5cc	Hauled passenger vehicles	0
5cd	Fixed or pre-defined formation	0
5ce	Special vehicles	0
5d	**Authorizations granted after upgrade or renewal – total**	**0**
5da	Wagon	0
5db	Locomotives	0
5dc	Hauled passenger vehicles	0
5de	Fixed or pre-defined formation	0
5df	Special vehicles	0

6	ERTMS equipped vehicles (end of year)	
6a	Tractive vehicles including trainsets equipped with ERTMS	0
6b	Tractive vehicles including trainsets – no ERTMS	0

7	Number of NSA staff (full time equivalent employees) by the end of year	
7a	FTE staff involved in safety certification	3
7b	FTE staff involved in vehicle authorization	2
7c	FTE staff involved in supervision	8
7d	FTE staff involved in other railway-related tasks	4

12 Appendix to annex: applicable definitions – progress with interoperability

Applicable definitions are those contained in the relevant articles of the legal documents.

In addition, the following definitions apply:

1 Lines excluded from the scope of IOP/SAF Directive (end of year)

Railway lines excluded by the Member States from the scope of the application of RSD/IOD: Directive (EU) 2016/797, Art. 1.4 a-d; DIRECTIVE (EU) 2016/798, Art. 2.3 a-d, as of 31.12.2020 (reporting year).

2 Length of new lines authorized by NSA (during the reporting year)

Length of lines constituting the Union rail system authorized for placing in service in accordance with Article 18.2 of Directive (EU) 2016/797 during the reporting year (2020).

3 PRM adapted stations (end of year)

Railway stations as of 31.12.2020 (reporting year), that complies with the requirements of the Commission Regulation (EU) No 1300/2014 (as amended by Commission Implementing Regulation 2019/772) on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (PRM TSI).

Full TSI compliance means full conformity with PRM TSI requirements, as demonstrated with the NoBo certificate. Partial TSI compliance means conformity with some (but not all) PRM TSI requirements, as demonstrated with the NoBo certificate. Accessible station means a station considered accessible under national legislation. (No NoBo certificate available.).

Railway station means a location on a railway system where a passenger train service can start, stop or end.

4 Train driver licenses (end of year)

Newly issued and valid driver licenses as of 31.12.2020 (reporting year), issued in accordance with the Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 (as amended by Directives 2014/82 and 2016/882 and by Regulation 2019/554) on the certification of train drivers operating locomotives and trains on the EU railway system.

5 Number of vehicles authorized under the interoperability Directive (EU) 2016/797 (during the reporting year)

The number of issued, renewed and amended vehicle authorizations for placing on the market in accordance with Article 21.8 of Directive (EU) 2016/797 during the reporting year (2020).

6 ERTMS equipped vehicles (end of year 2020)

Number of operated tractive vehicles (owned, leased, and rented minus rented-out) equipped and not equipped with ETCS level 1 and level 2.

Vehicles without power units are excluded. Multiple units and or with multiple driving cabs to be counted once. Includes only vehicles which are operated to transport freight or passengers, and shunting locos (if available). Yellow fleet and other IM vehicles are not included. Includes only vehicles which are registered in the country of main business activities of RUs.

7 Number of NSA staff (full time equivalent employees) by the end of year

Total number of full time equivalent NSA employees as of 31.12.2020 (reporting year).

Only staff dealing with railways is to be included.

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