Railway Accident Investigation Unit Ireland

INVESTIGATION REPORT

Collision with track equipment between Newbridge and Kildare,

27th August 2021

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Report structure

The report structure is taken from guidelines set out in “Commission Implementation Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be followed for railway accident and incident investigation reports” having regard to “Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety”.

Reader guide

All dimensions and speeds in this report are given using the International System of Units (SI Units). Where the normal railway practice, in some railway organisations, is to use imperial dimensions; imperial dimensions are used, and the SI Unit is also given.

All abbreviations and technical terms (which appear in italics the first time they appear in the report) are explained in the glossary.

Descriptions and figures may be simplified in order to illustrate concepts to non-technical readers.

Preface

The RAIU is an independent investigation unit within the Department of Transport which conducts investigations into accidents and incidents on the national railway network, the Dublin Area Rapid Transit (DART) network, the LUAS light rail system, heritage and industrial railways in Ireland. Investigations are carried out in accordance with the Railway Safety Directive (EU) 2016/798 enshrined in the European Union (Railway Safety) (Reporting and Investigation of Serious Accidents, Accidents and Incidents) Regulations 2020 and the Railway Safety (Reporting and Investigation of Serious Accidents, Accidents and Incidents Involving Certain Railways) Act 2020.

The RAIU investigate all serious accidents. A serious accident means any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway or tramline safety regulation or the management of safety. During an investigation, if the RAIU make some early findings on safety issues that require immediate action, the RAIU will issue an Urgent Safety Advice Notice outlining the associated safety recommendation(s); other issues may require a Safety Advice Notice.

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

The RAIU may also carry out trend investigations where the occurrence is part of a group of related occurrences that may or may not have warranted an investigation as individual occurrences, but the apparent trend warrants investigation.

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

Report Summary

At 23:00 hours (hrs) on the 26th August 2021 a work detail incorporating: three Iarnród Éireann Infrastructure Manager (IÉ-IM) Chief Civil Engineer's Department (CCE) staff (Engineering Supervisor (ES), Person in Charge (PIC) and General Operative (GO)) and eight contracted staff, met for a safety briefing at a works compound adjacent to the old Curragh Station, County Kildare. The work scheduled by the CCE Infrastructure Department was to replace a defective nine metre (m) section of rail. The work crew were briefed by the ES on their duties for the night and given site safety information including that the work would be under an Absolute Possession (T3 Possession). After the briefing, the ES and GO, followed by the contractors, drove to the access point close to the intended work site. They waited a few minutes until the ES confirmed the last timetabled train passed the worksite (although there was an unscheduled train to pass which was unknown to the ES), and then the ES stated that they were "good-to-go". The T3 Possession had not been prepared or granted at this stage i.e. the line should not have been accessed and no work should have commenced. When the work detail arrived at the site of the defective rail, the GO started to loosen the bolts which fix the rail to the concrete sleeper, while one of the contracted welders started digging the *ballast* out from around where the clamp was to be placed (the clamp is part of holding gear equipment that is clamped to the rail during rail replacement works). The two other contracted welders started to attach the clamp to the Down Leg of the Up Line. The contractor that was digging the ballast, turned to put down his shovel, when he saw the lights of an approaching train and shouted "train on" and all staff quickly moved to a *position of safety.*

The train (Train J283), an unscheduled empty train was travelling from Limerick Junction to Heuston Station, approached the worksite and struck the clamp which was clamped onto the rail. The driver of Train J283, Driver J283, brought the train to a stop and contacted the Mainline Signalman to report the collision and near-miss with staff.

The RAIU identified the following *causal factors* (CaF) associated with the accident as:

- CaF-01 – The ES instructed the work party to access the work site without the authorisation of the Person in Charge of Possession (PICOP); a violation of the requirements set out in Section T, Part Three, of the IÉ Rule Book. The ES erroneously thought that the last train had passed through the worksite;
- CaF-02 – The work detail entered the work site, as they accepted the authority of the IÉ-IM ES's position (both IÉ-IM and contracted staff), and assumed they were safe to enter the T3 Possession. This level of acceptance indicates an element of "authority gradient", which is further emphasised when the PIC (who took over the roles of the ES), rejected the GOs requests to cease work after the accident; and, they re-commenced working.

A *contributing factor* (CoF) was identified as:

- CoF-01 – The Safety Tours, as set out in the "Safety Tours and Compliance Verification" document (CCE-SMS-008), were ineffective at capturing rule breaks prior to possessions being granted, such as work parties accessing the railway before the possession being granted and equipment left near the railway line overnight.

A *systemic factor* (SF) was identified as:

- SF-01 – The Safety Tour Form differs from the checks required to be completed in the Guidelines for Safe Possession Management, the guidance part of the Safety Tour Form asks if the movements are planned and safely controlled, however, this information does not have to be recorded.

The RAIU made three safety recommendations related to the above identified factors, as follows:

- 2023002-01 – IÉ-IM and IÉ-RU should consider developing a system, whereby Signalmen must provide a Unique Possession Authority Number, or similar, when authorising T3 Possessions to the PICOP; this number or safeguard should be provided to all staff prior to entering a T3 Possession.
- 2023002-02 – IÉ-IM should review the current system of supervising and monitoring T3 Possessions, in terms of possession arrangements (e.g. Authority Number) and safety documentation (e.g. *method statements*); this review should identify improvements in terms of managing T3 Possessions. At a minimum, IÉ-IM should:
    - Expedite an increase in the supervision and monitoring of T3 Possessions by Engineering Department staff through updating CCE-SMS-001, specifically increasing monitoring prior to possessions being granted (while the IÉ-IM review and updating of supervision and monitoring of T3 Possessions is being undertaken);
    - Revise the current process of monitoring possessions through Safety Tours, CCE-SMS-008, to ensure the requirements of all guidelines are recorded in the Safety Tour Form;
    - Once the Safety Tours, CCE-SMS-008, documentation has been reviewed and updated, verify that the Safety Tours are being carried out correctly, and in full accordance with the guidelines, through an auditing process.

- 2023002-03 – IÉ-IM should promote a positive culture between staff, at different grades, to ensure ground level staff (including contractors) feel confident to challenge more senior staff in terms of safety. This can be achieved through staff briefing days, safety campaigns and development of a means for staff to provide feedback on supervision activities.

The RAIU also made four additional observations related to: transfer of information to the RAIU; competency management of staff; the correct reporting of accidents internally; post-accident inspection of rolling stock; and inspection quality of work that affects track safety. As a result, the RAIU made five safety recommendations related to these additional observations:

- 2023002-04 – IÉ-IM should introduce processes to ensure that information submitted to the RAIU is correct and submitted within the requested timeframes.
- 2023002-05 – The IÉ CCE Department (Engineering Department Division 3) should ensure the requirements of CCE-TMS-422 (2022) are met in full.
- 2023002-06 – IÉ-IM should conduct a full review on the reporting of accidents by IÉ-IM staff and contractors, consideration should be given to:
    - Reviewing CCE-SMS-007 and CCE-SMS-005 to identify any areas where improvements can be made related to the reporting of safety related occurrences; where areas of concern are identified these should be addressed;
    - Enhance and promote its confidential reporting system to ensure all staff (with a particular emphasis on contracted staff) can report issues related to safety and welfare;
    - Promote a positive culture, associated with the reporting of occurrences, in an effort to eliminate on-site authority gradients whereby staff cannot challenge supervisors.
- 2023002-07 – The CCE Department review and update CCE-SMS-001 and CCE-SMS-008 with a view to addressing the monitoring and supervision of works, in terms of quality of works that affects track safety, which are carried out under internal method statements (and contractor) method statements.

Contents

RAIU Investigation

RAIU decision to investigate

1 In accordance with the Railway Safety (Reporting and Investigation of Serious Accidents, Accidents, and Incidents Involving Certain Railways) Act 2020 (No. 18 of 2020) with reference to S.I. 430 of 2020 Regulation 5 (5), the RAIU investigate serious accidents, the RAIU may also investigate and report on accidents and incidents which under slightly different conditions might have led to a serious accident.

2 At approximately 00:18 hrs on Friday 27th of August 2021, the driver (Driver J283) of an unscheduled empty train travelling from Limerick Junction to Heuston Station (Train J283) reported to the Controlling Signalman that the train had struck something on the line, the item was a clamp (a piece of holding gear equipment that is clamped to the rail during rail replacement works). Driver J283 also reported that a number of staff were on the line and moved off as Train J283 approached them.

3 There were issues with the reporting of the accident due to staff on-site initially providing misleading information in relation to the severity of the accident, which meant that the accident was not immediately reported to the RAIU. The accident was later reported to the RAIU through the bulk monthly incident reports which led to the RAIU conducting a preliminary investigation.

4 The RAIU completed a Preliminary Examination Report and the RAIU's Chief Investigator (CI) made the decision to conduct a full investigation into the accident, given its impact on railway safety (S.I. 430 2020 Regulation 6 (2)(b)) as under slightly different circumstances the events may have led to a serious accident due to the potential of a derailment as a result of equipment being clamped to the rail.

5 In terms of categorisation, the EU Agency for Railways categorisation for this occurrence would be considered an: Accident – Collision.

6 The RAIU's CI allocated RAIU Senior Investigators, trained in accident investigation, to conduct this investigation, as appropriate. In this instance, no external parties were required to assist with the investigation.

Scope of investigation

7 The RAIU must establish the scope of the investigation to ensure that only pertinent information is recovered and reviewed. Therefore, for this investigation, the RAIU have defined the following scope:

- Establish the sequence of events leading up to the accident;
- Establish, where applicable, the causal, contributory and systemic factors;
- Examine the relevant elements of the IÉ Rule Book;
- Examine the relevant *risk assessments* and registers;
- Review the Safety Management System (SMS) documentation in relation to possessions.

Communications & evidence collection

8 During this investigation, the RAIU collated and logged the following evidence:

- IÉ-IM possession documentation;
- Train operations working timetable;
- Witness evidence from parties involved in the accident;
- Formal interviews of relevant parties;
- IÉ Rule Book;
- IÉ-IM standards, procedures and other documentation (including SMS documentation);
- IÉ-IM reports of investigations into similar occurrences.

9 Not all the parties involved co-operated with the internal IÉ-IM investigation, with IÉ-IM's Report of Investigation[12], noting that during the investigation:

- "It became apparent, from evidence that emerged during interviews with the staff involved, that this incident was far more serious than what was first reported";
- "Progress of the investigation was hampered by a lack of candour";
- There were "misleading statements", "untruths" or staff being "unable to remember" or deliberately only providing "partial information".

10 The RAIU found that some parties directly and indirectly involved in the accident were evasive with their evidence, but due to the efforts of the internal IÉ safety departments, the RAIU were able to collate the evidence to establish the events on the night of the accident.

11 The RAIU request information from parties under investigation through Requests for Information (RFIs); these are numbered forms with requests for details of standards in place at the time of the occurrences, for example. The information should be returned by a date specified by the RAIU. During this investigation, the RAIU found that the information was submitted late, in some cases, the wrong information was submitted e.g. updated documents where submitted, rather than documentation that was in place at the time of the accident. This lengthened the process of the RAIU investigation; the RAIU are required to publish the investigation report within twelve months[3], however, due to the late notification of the accident and the slow response to RFIs this could not be achieved.

12 Considering that the purpose of an investigation by the RAIU is to improve railway safety by establishing in so far as possible the causes of an accident with a view to making safety recommendations for the avoidance of similar accidents in the future, any delays to investigation reports, could impact the safe running of the railway, therefore the RAIU consider this to be an additional observation, AO-01 (paragraph 229), and have made an safety recommendation to address the observation (paragraph 247).

[1] "Train J283 collision with equipment attached to the rail at 28 miles 1540 yards between Newbridge and Kildare on 27th August 2021", published on the 11th January 2022.

[2] It should be noted that IÉ-IM engaged consultants Arthur D. Little Limited to lead the investigation into the occurrence.

[3] There is an allowance in place for the extension of the 12 months i.e. the release of an interim statement.

The Accident

Parties & roles associated with the accident

Parties involved in the accident

13 IÉ–IM is the Infrastructure Manager who owns and operates the railway infrastructure in Ireland and operates under a Safety Authorisation certificate issued by the Commission for Railway Regulation (CRR). The IM Safety Authorisation is issued in conformity with Commission Regulation (EU) 1169/2010; the authorisation was renewed in 24th March 2018 for a period of four years (in place at the time of the accident).

14 The IÉ-IM department involved in the accident and relevant to this investigation is the IÉ-IM CCE Department. The Chief Civil Engineer directs the Technical Support, Business Support and Safety sections within the Civil Engineering Department of IÉ. The CCE Department carries out the inspections and maintenance of track and structures and is divided into three different geographical areas, with offices based at Dublin, Athlone and Limerick Junction.

15 The Division (designated area on the IÉ network) involved in the accident, is Division 3, Kildare.

Roles involved in the accident

16 The roles involved in the accident from IÉ-IM Division 3 are listed below (the Accountable Line Manager for Division 3 is the Regional Manager Dublin West). The roles are:

- Engineering Supervisor (ES) – The person responsible for ensuring that the necessary marker boards are provided to indicate the limits of the worksite; to authorise movements entering or within the worksite to ensure safety; and, to ensure the worksite is clear when work is finished so that the possession may be safely given up (Paragraph 10.1, Section T Part Three of the IÉ Rule Book). In this accident, the ES was also acting as the Track Safety Co-ordinator (TSC) – The person responsible for making arrangements to prevent anyone in your group being endangered by trains (Section 6.0, Section B Part Two of the Rule Book);
- Person in Charge (PIC) – The person responsible for directing the movement of the works on site, including the movement of the Road Rail Vehicles (RRVs);
- General Operatives (GO) – Labourer;

- *Person in Charge of Possession* (PICOP) – The person responsible for: ensuring that the necessary protection is provided for the possession; authorising movements entering or within the possession to ensure their safety; and ensuring that the possession is given up properly so that normal working is safely resumed (Paragraph 9.1, Section T Part Three of the Rule Book).

17 Eight contractors[4] were employed for the task made up of three welders, three general operatives and two Road Rail Vehicle Operatives (RRVOs).

18 All competency and assessment records (such as Safe Pass, Personal Track Safety, etc) were in-date and valid for their safety critical roles[5].

19 The role involved in the accident from IÉ-RU is the driver of Train J283, Driver J283, who was competent to drive the train at the time of the accident.

Roles indirectly involved in the accident

20 There were also a number of IÉ-IM roles involved after the accident, such as the:

- Permanent Way Inspector (PWI) – Responsible for programming and completing Permanent Way Maintenance and CCE renewal as required by standard in the area assigned.

21 This role and other roles related to responsibilities and accountabilities of higher management will be discussed later in the report as part of the outlining of the SMS.

[4] CCE-SMS-001 defines a contractor as “A firm or its staff undertaking work specified by Iarnród Éireann and the work is executed on Iarnród Éireann property at the CCE Location”.

[5] The RAIU identified issues related to competency management related to the rail replacement (discussed in paragraphs 107 - 112) has been identified by the RAIU as an additional observation, AO-02 (paragraph 229), and have made an associated safety recommendation, 2023002-05 (paragraph 248).

Summary of the accident

22 On the evening of the 26th August 2021, at 23:00 hrs, a work detail incorporating three IÉ-IM CCE staff, the ES, PIC, GO and eight contracted staff met for a safety briefing at a works compound adjacent to the old Curragh Station.

23 The work scheduled by the CCE Infrastructure Department was to replace a defective 9 metre (m) section of rail. The work crew were briefed by the ES on their duties for the night and given site safety information including that the work would be under an Absolute Possession T3 Possession), to be referred to as T3 Possessions in this report.

24 After the briefing, the ES and GO, followed by the contractors, drove to the access point close to the intended work site. They waited a few minutes until the ES confirmed the last timetabled train, Train J219, passed the worksite, and then the ES stated that they were "good-to-go". The T3 Possession had not been granted at this stage i.e. the railway line should not have been accessed and no work should have commenced. The marker boards were brought to the site but not erected.

25 At the site of the defective rail, the GO started to loosen the fastening bolts, which fasten the rail to the concrete sleeper by means of fastening clip (see Figure 1).

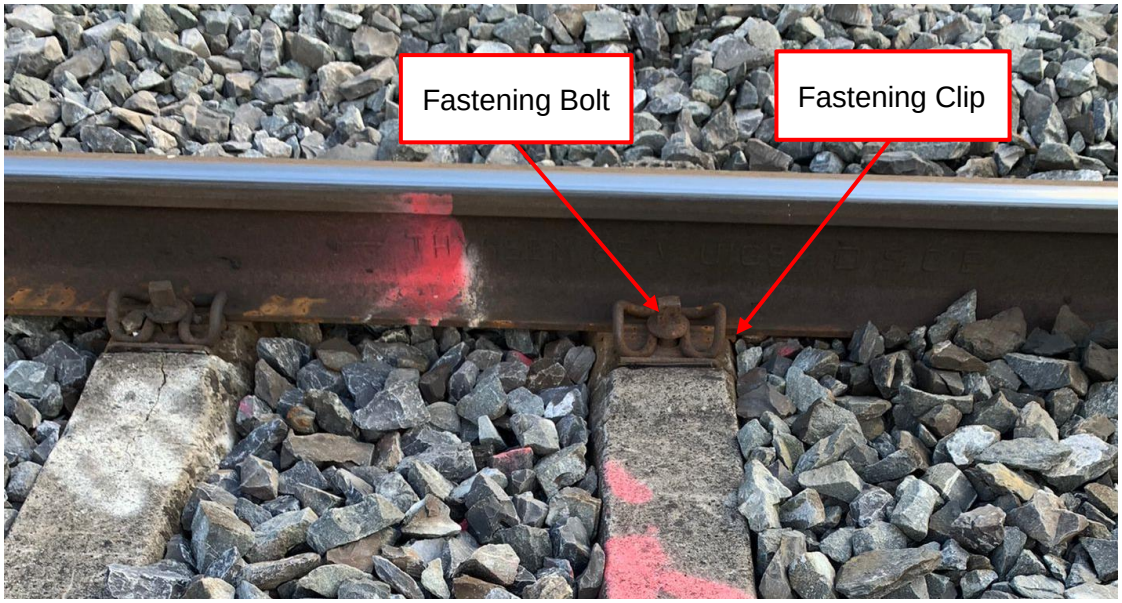


Figure 1 – Fastening bolts

26 At the same time, one of the contracted welders started digging the ballast out from around where the clamp[6] was to be placed, whilst the two other contracted welders started to attach the clamp to the Down Leg of the Up Line. Figure 2 illustrates how the clamp would be fixed to the rail during the works.

Figure 2 – Clamp fixed to rail

27 The contractor that was digging the *ballast*, turned to put down his shovel, when he saw the lights of an approaching train and shouted "train on" and all staff quickly moved to a *position of safety.*

28 Train J283 struck the clamp, which at the time of collision, was clamped onto the rail, see Figure 2.

29 Driver J283 brought Train J283 to a stop and contacted the Mainline Signalman to report that Train J283 had struck something on the line as the train approached the Curragh; and, that he saw members of staff on the Up Line who had moved off the line as Train J283 approached.

30 There were issues with the reporting of the accident by the ES and other members of staff, which initially "downplayed" the accident, with inference given that a small bolt had struck Train J283 and not that a piece of equipment that had been clamped to the rail.

[6] The clamp is fixed to the rail, with *rail tensors*, as part of the *rail stressing* process used during rail replacement.

General description of the railway

Infrastructure

31 The railway line between Heuston Station, Dublin (0 Mile Post (MP)) and Kent Station, Cork (165 ¼ MP) is 266 kilometres (km); and is a double line throughout with a section between Inchicore and Hazelhatch having four tracks.

32 The line is continuous welded rail (CWR) throughout.

33 The accident occurred near the 28 miles 1540 yards on the Up line between Kildare and Newbridge (see Figure 3).

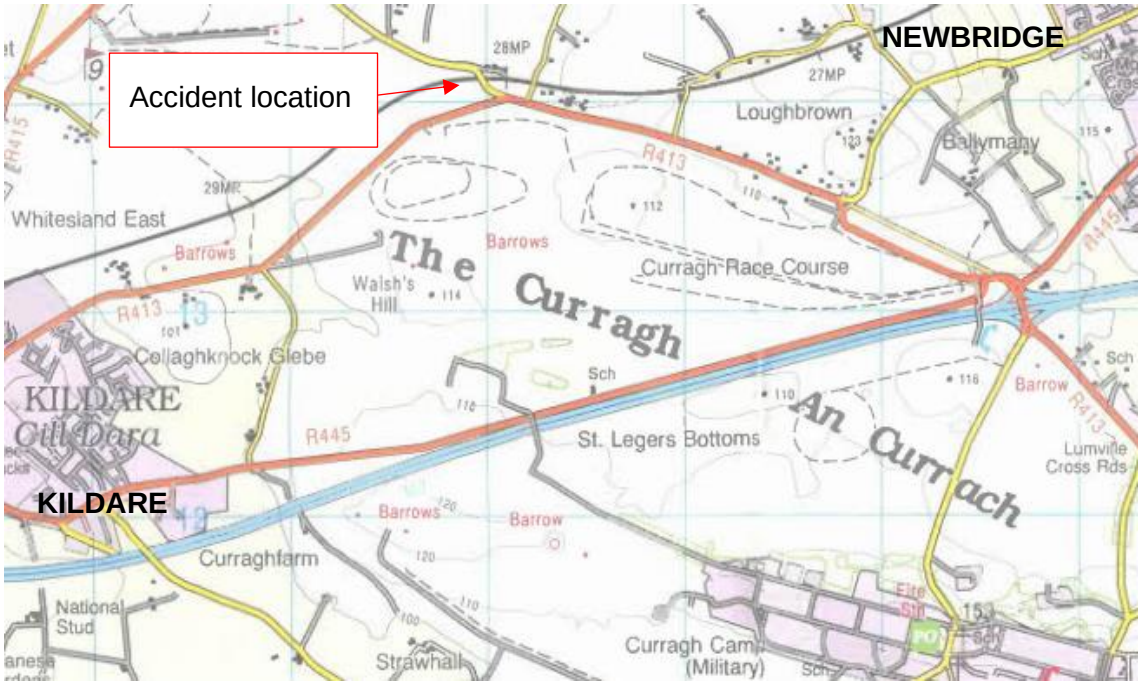


Figure 3 – Location of the accident

Rolling Stock

34 The train involved in the accident (Train J283) was a 201 powered MK IV set travelling from Limerick Junction to Heuston Station, Train ID J283 (see Figure 4 for an example of a MK IV).

Figure 4 – Example of an IÉ-RU MK IV

35 The unit was a seven-piece set, with the Driving Van Trailer (DVT), 4003, leading (see Figure 5 for the configuration of the train).

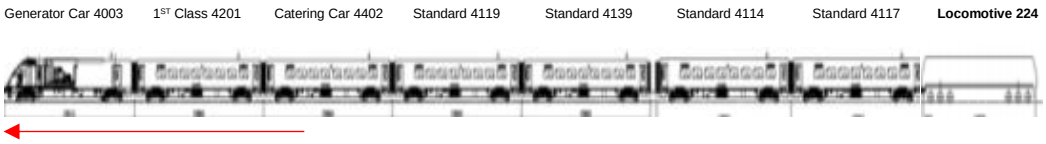


Figure 5 – Illustration of the eight carriage Mk4 and 201 Locomotive configurations

36 The total train length was approximately 204.7 metres (m). A MK IV has a maximum permitted speed of 100 miles per hour (mph) (160 kilometres per hour (km/h)), see Figure 4 for an example of an MK IV.

37 The train was an empty train having been involved in a Signal Passed at Danger (SPAD) accident at Limerick Junction on the 26th August and was returning to Heuston, Dublin.

38 No factors related to the rolling stock were found to have contributed to the accident.

Signalling and communications

39 The route involved in the accident is fitted with two, three and four aspect colour light signals. Track Circuit Block (TCB) regulations apply to this route.

40 The section of track involved in the accident, is controlled by the Centralised Traffic Control (CTC) Signalman located in CTC, Connolly Station, Dublin.

41 The means of communication between the train drivers and the signalman on this route is through train radio.

42 No factors in relation to the condition of the signalling and communications systems were found to have contributed to the accident.

Operations

43 Trains travelling towards Dublin, are travelling on the Up Line, in the Up Direction. Trains travelling towards Cork are travelling on the *Down Line*, in the *Down Direction*.

44 The maximum permissible line speed for the line between 0 MP and 165 ¼ MP is 100 mph (160 km/h) subject to permanent or temporary speed restrictions. At the time of the occurrence there was a permanent speed restriction of 90 mph (145 km/h) in place between 29 MP and the 28 ½ MP over the Up road.

Fatalities, injuries & material damage

Fatalities & injuries

45 None of the IÉ-IM staff or contractors were physically injured as a result of the accident; however, subsequently some of the staff stated that they suffered from shock.

Material damage

46 The section of rail where the clamp was attached was significantly damaged, see Figure 6; this section of rail was replaced immediately after the accident.

Figure 6 – Damaged rail

47 The clamp was also damaged, see Figure 7. Figure 8 shows how the clamp would have attached onto the rail.

Figure 7 – Damaged clamp

Figure 8 – Clamp on the rail

48 Initial inspections and examinations (five in total) of Train J283 found no faults, however, on determination that the accident was more severe than initially reported, a more thorough examination was conducted by the CME Department on the 22nd September 2021 (three weeks after the accident); which found damage to a sander bracket and substantial damage to the front right wheel of control car 4003 (Figure 9). This is discussed in further detail in paragraphs 176 to 179.

Figure 9 – Damage to wheel (4003)

External circumstances

49 The accident occurred at 00:18 hrs during which time it was dark and dry; the temperature was approximately around 14ºC (Met Éireann, Oak Park, Carlow).

50 The weather conditions did not contribute to the accident.

Evidence

IÉ-IM Safety Management Standards

CCE Safety Management System, CCE-SMS-001

Introduction

51 CCE-SMS-001, CCE Safety Management System – Describes the CCE's SMS and the activities, accountabilities and roles of CCE staff in the management of workplace and/or worksite, *Occupational Safety* (OS), *Track Safety*, *Plant & Machinery Safety* (P&MS), Buildings & Facilities Safety, Buildings and Facilities Mechanical and Electrical Safety and Structures Safety. It was first issued in 2010 and at the time of the accident was on Version 6.0 published in 2018. It will be referred to as CCE-SMS-001 for the remainder of this report.

Policy & Principles

52 CCE-SMS-001 describes the CCE SMS and the activities, accountabilities and roles of CCE staff in the management of workplace and/or worksite OS, Track Safety, P&MS, Buildings & Facilities Safety, Buildings and Facilities Mechanical and Electrical Safety and Structures Safety.

53 In terms of hierarch, the CCE Department relevant to this investigation is as follows (i.e. shaded staff have not been outlined further in this report)[7]:

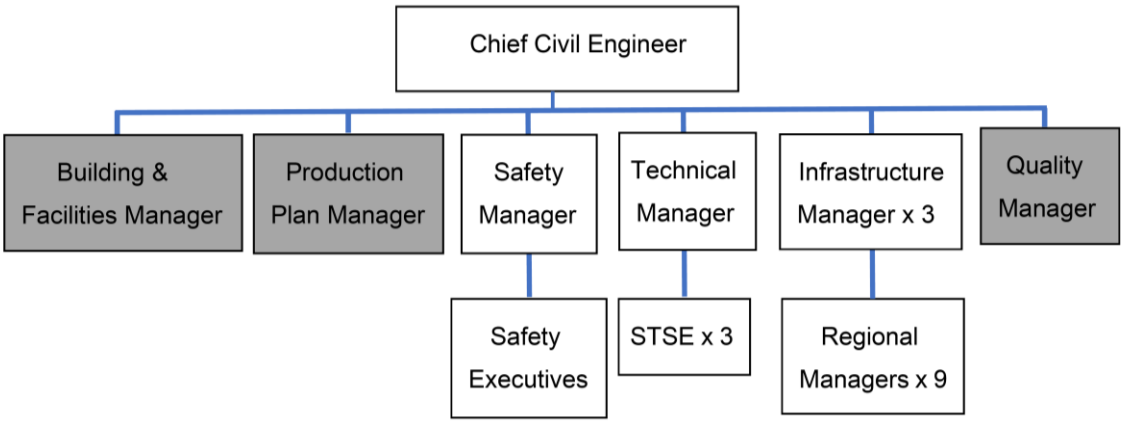


Figure 10 – CCE Department hierarchy

[7] The Building & Facilities and Production Manager are not relevant to this investigation. It should be noted that the accountabilities and responsibilities for the Quality Manager are not outlined in CCE-SMS-001.

54 CCE-SMS-001's principles are that:

- All CCE managers have a duty to promote a safety culture;
- Accountable Line Managers are directly accountable for the OS and P&MS for those workplaces and worksites under their control and also for the quality of work that affects Track Safety and Structures Safety (TS&SS);
- Accountable Line Managers will organise their operations so that work is planned such as to ensure the availability of the required resources, competent people, appropriate equipment and adequate time;
- Hazards are identified and risks are assessed and precautionary/mitigation actions are implemented to limit the probability of those risks occurring;
- Accountability for OS and P&MS resides with the Accountable Line Managers responsible for the CCE Locations and they are given access to resources to achieve this accountability;
- Accountable Line Managers monitor the OS and P&MS by adhering to a programme of specific Safety Tours;
- Accountability for TS&SS resides with the Technical Manager and, on a region by region basis, with the Senior Track & Structures Engineers (STSEs). The STSEs are given authority to direct Line Managers to achieve this accountability.

Accountabilities & responsibilities

Chief Civil Engineer (CCE)

55 The CCE's accountabilities, relevant to this investigation, include:

- Setting OS and TS&SS objectives and for providing the resources to achieve these objectives;
- Ensuring regular Safety Tours are done in a thorough and complete manner;
- In terms of TS&SE that the CCE Department's employees and contracted employees execute their tasks in a manner that is technically correct, at the correct frequency, with the correct care and in accordance with the CCE Technical Documentation, such as to ensure the safe operation of the track, structures, plant & machinery and all CCE assets. And, that a comprehensive risk management process is in place to manage structures risk and track risk and to ensure that all track and structures in all the CCE locations is at all times safe for the duty it is expected to achieve.

Technical Manager

56 The Technical Manager is accountable for TS&SS for the entire IÉ network, which is achieved through risk management and actions taken by the Technical Manger and team to manage all track and structures risks, specifically the identification, mitigation, resolution and control of these risks. Accountabilities include ensuring that an appropriately in-depth programme of Compliance Verification (through audit, investigation, observance and review) is conducted by STSEs to verify that all the tasks required from the Accountable Line Managers (and their staff) are being completed in a manner that is technically correct, at the correct frequency, with the correct care and in accordance with the CCE Technical Documentation, such as to ensure TS&SS.

Senior Track & Structures Engineers (STSEs)

57 The STSE is accountable for TS&SS in CCE Locations in his/her remit. Accountabilities, include implementing a programme of Compliance Verification (through audit, investigation, observance and review), using an appropriate sampling size, within these CCE Locations to verify that all the tasks required from the Accountable Line Managers (and their staff) are being completed in a manner that is technically correct, at the correct frequency, with the correct care and in accordance with the CCE Technical Documentation, such as to ensure TS&SS. Specifically, checking that all the inspections, examinations, condition assessments, technical evaluations and/or testing (and all associated documentation) as required to correctly maintain, operate, assess and determine the condition of all the track and structures are done consistently.

Regional Manager

58 The Regional Manager is responsible for all aspects of the management of production activities within a region made up of a number of CCE Locations. The Regional Manager is accountable for all the aspects of TS&SS, P&MS and OS.

59 Specifically, for P&MS, identifying the plant and machinery related training requirements per employee and releasing employees for training (5.16.3.2). Doing regular Safety Tours to verify that Contractors using contracted or their own equipment do so in a manner consistent with their method statement and in accordance with the intended purposes and in a manner consistent with safe operation for the application and use in question (5.16.3.4)[8].

[8] There is no reference here to checking contractor competencies.

60 For TS&SS, ensuring that employees and Contractors under his/her control execute their daily tasks in a manner that is technically correct, at the correct frequency, with the correct care and in accordance with the CCE Documentation, such as to ensure the safe operation of the Track and Structures (5.16.4.1). Following the instructions and technical advice of the STSE on TS&SS and delivering the precautionary/mitigation actions per Risk in accordance with the STSE's programme requirements (5.16.4.3). Identifying the technical training requirements per employee and releasing employees for training (5.16.4.7).

Permanent Way Inspector

61 Every Supervisor that has a responsibility for overseeing and guiding workplace activities in any CCE Location is accountable for OS "during his working hours" (5.17.1.1) including:

- Doing Safety Tours thoroughly and identifying good corrective actions and implementing those actions in a timely manner (5.17.2.6);
- Identifying the workplace and Occupational Safety training requirements per employee and managing the workload to enable employees to be released for training (5.17.2.9);
- Ensuring that Contractors working with or for his teams follow a safe method of working, have the required systems in place for working safely and works safely (5.17.2.12).

62 In terms of TS&SS, accountabilities include: for each of these supervisors includes:

- Ensuring that only competent manpower and the correct tools and other resources are used (5.17.3.2);
- Identifying the technical training requirements per employee and managing the workloads to ensure that employees can be released for training (5.17.3.4).

Competency Manager

63 The Competency Manager reports to the Head of Health & Safety, IM and is accountable for all aspects of the management of competency in the CCE, Signalling, Electrical and Telecommunications (SET), New Works (NW), and IÉ-IM Operations (IMO) departments (5.26.1).

Training Manager

64 The Training Manager reports to the IÉ-IM HR Manager and is Accountable for all aspects of the management and delivery of training in the CCE, SET, NW and IMO departments (5.27.1).

Site Safety Briefings

65 CCE-SMS-003, Briefings, set out the requirements for all type of briefings within the CCE Department. Version 4.0 was published on the 12/03/2018, it will be referred to as CCE-SMS-003 for the remainder of this report. Effectively CCE-SMS-003 requires Site Safety Briefings to be "conducted every day for every team that is working on or near the line".

66 CCE-SMS-003 also states that "It is very likely that the content of a briefing will consist of an additional document such as a Risk Assessment or a Safe System of Work or a technical document prepared by the Senior Track & Structures Engineer's team" (4.2.3), this would include Method Statements, as in the Method Statement related to "Replacing rails using tensors", reference number, D3MS2021_003, published on the 18th January 2021 (this will be further discussed in paragraphs 115 - 117).

67 Prior to the works commencing on site, the ES did conduct a Site Safety Briefing as required by CCE-SMS-003, which incorporates the following ten sub-headings:

- Each individual is responsible for their own safety;
- The type of protection at the site;
- Access and egress arrangements;
- The main hazards;
- The main risks from train movements;
- The main risks from plant and machinery on the site;
- The risks from work adjacent to the site;
- Emergency contact details;
- Invitation for any questions regarding the briefing;
- Reminder to bring any safety concerns to the ES during the shift.

68 The ES recorded details (including the names of those present) in the CCE Site Safety Briefing Form; however, ES did not have those present to physically sign the form[9].

[9] During the COVID-19 pandemic, staff were not required to physically sign the form; however, this arrangement ceased on the 19th July 2021; as set out in Weekly Circular Notice (3985); but Division 3 had not re-implemented the signing of forms.

Safety Tours and Compliance Verification

Introduction

69 The aim of CCE-SMS-008, Safety Tours and Compliance Verification, is to meet the statutory and IM obligations regarding the monitoring of safety and to execute Safety Tours and Compliance Verification in order to reduce the level of risk in the workplace and at worksites. First published in 2010, and now on Version 4.0, operative since 2018, it will be referred to as CCE-SMS-008 for the remainder of this report.

70 The objective of the Safety Tours is to improve the safety of the workplace by reducing the risk in the workplace. The person doing the Safety Tour will observe the workplace safety first hand, identify workplace Hazards or Risks, ensure that employees are executing activities in accordance with CCE Documentation and Work Instructions, ensure that the Emergency Procedures are fully compliant, ensure that the workplace is safe and orderly, and identify any unsafe practices in the daily operations.

71 The number of Safety Tours per CCE Location per month is outlined in CCE-SMS-001. During any month the Accountable Line Manager will undertake at least one Safety Tour while members of the local management/supervisory team will do the balance of the number of Safety Tours required e.g. in any month the Regional Manager for Division 3 will undertake at least one of the two Safety Tours in his area while other supervisors/inspectors will do the other one.

Policy, Principles, Accountabilities & responsibilities

72 CCE-SMS-008's policy "to meet the statutory and Infrastructure Manager obligations regarding the monitoring of safety and to execute Safety Tours and Compliance Verification in order to reduce the level of risk in the workplace and at worksites".

73 CCE-SMS-008's principles are similar to that outlined in CCE-SMS-001 in terms of the CCE, Line Managers, Technical Managers, with the addition of the STSEs, who monitor the TS&SS within the CCE Locations that they are accountable for through a programme of Compliance Verification.

74 The accountabilities and responsibilities are similar to those outlined in CCE-SMS-001.

Implementation – Safety Tour & Compliance Verification of the workplace

75 Safety Tours and Risk Assessments are used to verify that the CCE Location's processes for managing safety are appropriate for the tasks required, that emergency plans are appropriate, that Safe Systems of Work are effective and being followed, and that Hazards associated with work activities are addressed and mitigated.

76 The Accountable Line Manager is accountable for ensuring that the Safety Tours are representative of all the activities at that CCE Location and that tours are done such as to ensure that all the different operations and tasks in the CCE Location is scrutinised during different Safety Tours over several months.

Implementation – How to do a Safety Tour & Safety Tour Forms

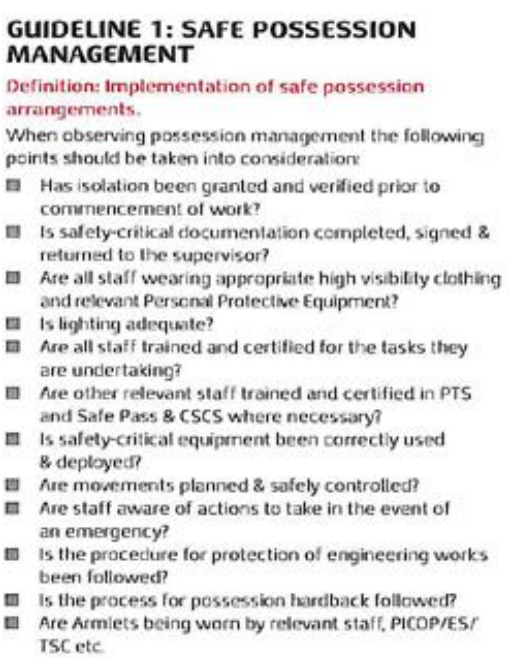
77 CCE-SMS-008 sets out "how to do a Safety Tour", through using the ten guidelines set out in the Safety Tour Form, namely:

- Guideline 1: Safe Possession Management;
- Guideline 2: Safe Engineering Train Movement;
- Guideline 3: Safe Road Rail Vehicle Movement;
- Guideline 4: Safe Red Zone Working;
- Guideline 5: Small Plant and Equipment Affecting Safety;
- Guideline 6: Safe Manual Handling Operations;
- Guideline 7: Safety Affected by Excavations & Work at Height;
- Guideline 8: Safe Work Interface;
- Guideline 9: Safety During Emergencies;
- Guideline 10: Other Items Affecting Safety.

78 Specifically, related to this accident, in the "Guidelines for Completing the CCE Safety Tour Form", Guideline 1: Safe Possession Management (see Figure 11), the guidance part of the Safety Tour Form asks:

- Are movements planned & safely controlled?
- Is the procedure for engineering works been (sic) followed?
- Are all staff trained and certified for the tasks they are undertaking?

79 However, the Safety Tour Form does not allow the above details to be recorded in the actual form (see Figure 12):



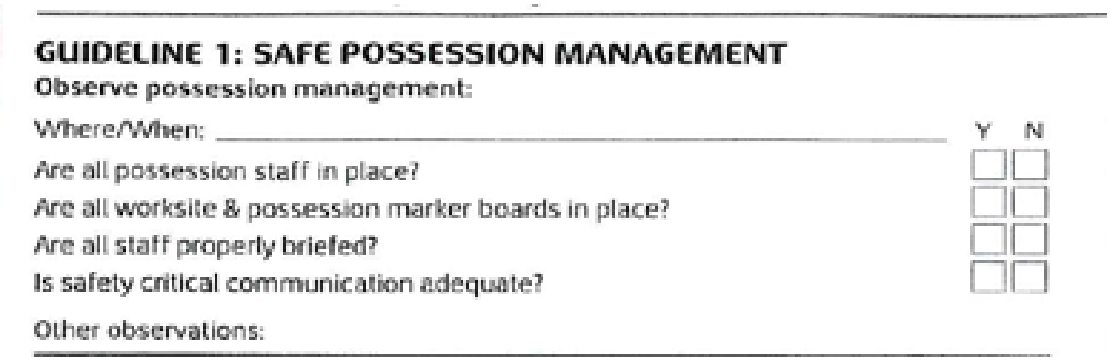
GUIDELINE 1: SAFE POSSESSION MANAGEMENT

Definition: Implementation of safe possession arrangements.

When observing possession management the following points should be taken into consideration:

- Has isolation been granted and verified prior to commencement of work?
- Is safety-critical documentation completed, signed & returned to the supervisor?
- Are all staff wearing appropriate high visibility clothing and relevant Personal Protective Equipment?
- Is lighting adequate?
- Are all staff trained and certified for the tasks they are undertaking?
- Are other relevant staff trained and certified in PTS and Safe Pass & CSCS where necessary?
- Is safety-critical equipment been correctly used & deployed?
- Are movements planned & safely controlled?
- Are staff aware of actions to take in the event of an emergency?
- Is the procedure for protection of engineering works been followed?
- Is the process for possession handback followed?
- Are Armlets being worn by relevant staff, PICOP/ES/ TSC etc.

Figure 11 – Guideline 1 Extract



GUIDELINE 1: SAFE POSSESSION MANAGEMENT

Observe possession management:

Where/When: _____ Y N

Are all possession staff in place? ☐ ☐

Are all worksite & possession marker boards in place? ☐ ☐

Are all staff properly briefed? ☐ ☐

Is safety critical communication adequate? ☐ ☐

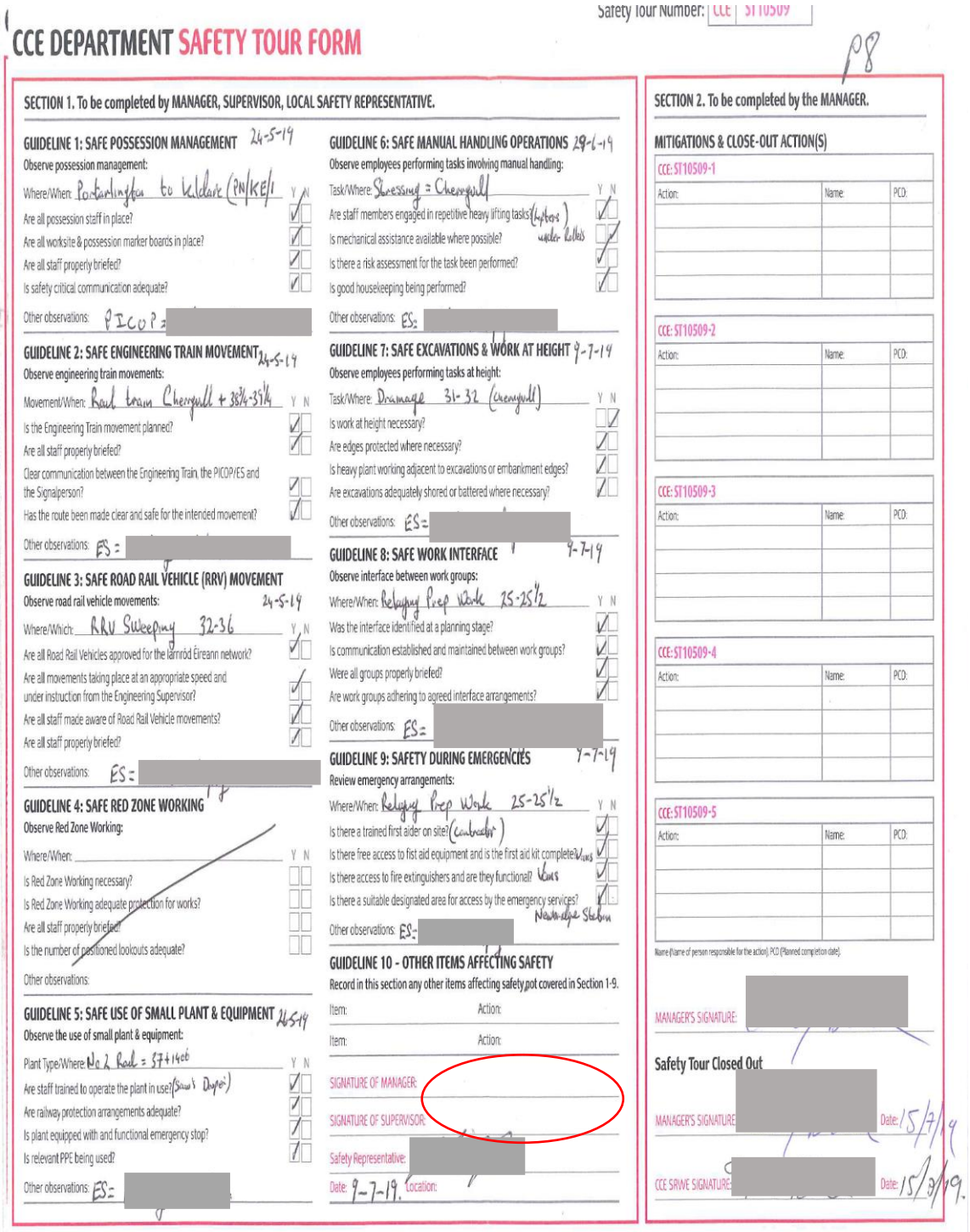
Other observations: _____

Figure 12 – Extract from Safety Tour Form

80 In the guidelines for Guideline 5: Small Plant and Equipment Affecting Safety, one of the questions asks: "Is housekeeping being maintained?". However, the Safety Tour Form does not ask this question. But, under Guideline 5, the Safety Tour Form does ask "are railway protection arrangements adequate?".

81 CCE-SMS-008 does require that staff, including STSEs, verify, through Safety Tours that all the tasks are being completed in a manner that is technically correct, at the correct frequency, with the correct care and in accordance with the CCE Technical Documentation. There is no apparent requirement to check the actual works (which are subject to the Safety Tour Form) i.e. check that the right section of rail has been replaced.

82 The RAIU requested samples of completed Safety Tour Forms related to Guideline 1: Safe Possession Management; Figure 13 is an example of a completed form.



CCE DEPARTMENT SAFETY TOUR FORM

Safety Tour Number: CCE | ST10509

SECTION 1. To be completed by MANAGER, SUPERVISOR, LOCAL SAFETY REPRESENTATIVE.

GUIDELINE 1: SAFE POSSESSION MANAGEMENT 24-5-19
Observe possession management:
Where/When: Portarlington to Kildare (PN/KE/1)
Are all possession staff in place? Y ✓
Are all worksite & possession marker boards in place? Y ✓
Are all staff properly briefed? Y ✓
Is safety critical communication adequate? Y ✓
Other observations: PICOP = [redacted]

GUIDELINE 2: SAFE ENGINEERING TRAIN MOVEMENT 24-5-19
Observe engineering train movements:
Movement/When: Rail train Cherryhill + 38¾-35¼
Is the Engineering Train movement planned? Y ✓
Are all staff properly briefed? Y ✓
Clear communication between the Engineering Train, the PICOP/ES and the Signalperson? Y ✓
Has the route been made clear and safe for the intended movement? Y ✓
Other observations: ES = [redacted]

GUIDELINE 3: SAFE ROAD RAIL VEHICLE (RRV) MOVEMENT
Observe road rail vehicle movements: 24-5-19
Where/Which: RRV Sweeping 32-36
Are all Road Rail Vehicles approved for the Iarnród Éireann network? Y ✓
Are all movements taking place at an appropriate speed and under instruction from the Engineering Supervisor? Y ✓
Are all staff made aware of Road Rail Vehicle movements? Y ✓
Are all staff properly briefed? Y ✓
Other observations: ES = [redacted]

GUIDELINE 4: SAFE RED ZONE WORKING
Observe Red Zone Working:
Where/When:
Is Red Zone Working necessary? Y
Is Red Zone Working adequate protection for works? Y
Are all staff properly briefed? Y
Is the number of positioned lookouts adequate? Y
Other observations:

GUIDELINE 5: SAFE USE OF SMALL PLANT & EQUIPMENT 24-5-19
Observe the use of small plant & equipment:
Plant Type/Where: No 2 Rail = 37+140
Are staff trained to operate the plant in use? (Simon Dwyer) Y ✓
Are railway protection arrangements adequate? Y ✓
Is plant equipped with and functional emergency stop? Y ✓
Is relevant PPE being used? Y ✓
Other observations: ES = [redacted]

GUIDELINE 6: SAFE MANUAL HANDLING OPERATIONS 29-6-19
Observe employees performing tasks involving manual handling:
Task/Where: Screening = Cherryhill
Are staff members engaged in repetitive heavy lifting tasks (Laptops) Y ✓
Is mechanical assistance available where possible? under 16kgs Y
Is there a risk assessment for the task been performed? Y ✓
Is good housekeeping being performed? Y ✓
Other observations: ES: [redacted]

GUIDELINE 7: SAFE EXCAVATIONS & WORK AT HEIGHT 9-7-19
Observe employees performing tasks at height:
Task/Where: Drainage 31-32 (Cherryhill)
Is work at height necessary? Y
Are edges protected where necessary? Y ✓
Is heavy plant working adjacent to excavations or embankment edges? Y ✓
Are excavations adequately shored or battered where necessary? Y ✓
Other observations: ES = [redacted]

GUIDELINE 8: SAFE WORK INTERFACE 9-7-19
Observe interface between work groups:
Where/When: Relaying Prep Work 25-25½
Was the interface identified at a planning stage? Y ✓
Is communication established and maintained between work groups? Y ✓
Were all groups properly briefed? Y ✓
Are work groups adhering to agreed interface arrangements? Y ✓
Other observations: ES = [redacted]

GUIDELINE 9: SAFETY DURING EMERGENCIES 9-7-19
Review emergency arrangements:
Where/When: Relaying Prep Work 25-25½
Is there a trained first aider on site? (Contractor) Y ✓
Is there free access to fist aid equipment and is the first aid kit complete? Yes Y ✓
Is there access to fire extinguishers and are they functional? Yes Y ✓
Is there a suitable designated area for access by the emergency services? Y ✓
Other observations: ES: [redacted] Newbridge Station

GUIDELINE 10 - OTHER ITEMS AFFECTING SAFETY
Record in this section any other items affecting safety not covered in Section 1-9.
Item: Action:
Item: Action:
SIGNATURE OF MANAGER:
SIGNATURE OF SUPERVISOR:
Safety Representative: [redacted]
Date: 9-7-19. Location:

SECTION 2. To be completed by the MANAGER.

MITIGATIONS & CLOSE-OUT ACTION(S)

CCE: ST10509-1

Action:	Name:	PCD:

CCE: ST10509-2

Action:	Name:	PCD:

CCE: ST10509-3

Action:	Name:	PCD:

CCE: ST10509-4

Action:	Name:	PCD:

CCE: ST10509-5

Action:	Name:	PCD:

Name (Name of person responsible for the action), PCD (Planned completion date).

MANAGER'S SIGNATURE: [redacted]

Safety Tour Closed Out

MANAGER'S SIGNATURE: [redacted] Date: 15/7/19

CCE SRWE SIGNATURE: [redacted] Date: 15/7/19.

Figure 13 – Example of Safety Tour Form

83 The required information has been recorded, however, information in the "other observations" section is limited; in the case above it is limited to the names of the ESs, in other forms reviewed by the RAIU if may include number of staff or type of work, equipment or rolling stock.

84 Signatures are not always included, see circled in Figure 13; and in some cases dates were not provided, however, it is noted that there is no allocated spot for the date or time. On reviewing the dates provided, the earliest Safety Tour was carried out on the 24th May 2019; however, the Manager or CCE Safety Review Workshop Executive (SRWE) Manager did not sign off on the Safety Tour Form until almost two months later the 15th July 2019, similar instances were found throughout the examples.

85 In addition, in the example provided, there were only a few instances of “Mitigations & Close-Out Action(s)”, in Section 2, which have been included by the supervisors.

Implementation – Compliance Verification to detect Structures Hazards or Track Hazards

86 The STSE is accountable for deploying Compliance Verification in order to ensure that the quality of work as done by employees is in accordance with the Technical Documentation and that any Structures or Track related Hazards are detected. A Compliance Verification programme is planned and scheduled by the STSE every year and the programmes are reviewed by the Technical Manager.

87 The Compliance Verification programme should sample 15% of the completed tasks through verification checks, audit, investigation, observance and review in order to verify that the tasks have been completed correctly, to the correct frequency and that there are no technical operational Hazards, workmanship quality Hazards, component performance Hazards or system performance Hazards associated with the Structures or Track assets. Compliance Verification results must be tabulated such that corrective actions can be identified and executed.

88 Every Track Hazard or Structures Hazard as identified during the Track and Structures Compliance Verification is entered into a Track Risk register or Structures Risk register respectively and is then Risk managed accordingly.

Method Statements

89 CCE-SMS-001 states that the principles, etc, are related to all CCE workplaces and worksites. Related to Method Statements, there are twenty-two references[10] to Method Statements in CCE-SMS-001; these are all related to contractors Method Statements.

90 In addition, there are nine references to Method Statements in CCE-SMS-008, stating that regular Safety Tours are done to verify that Contractors using contracted, or their own equipment does so in a manner consistent with their method statement[11] (3.1.5.1).

91 It should be noted that the Method Statement involved in this accident was an IÉ-IM Method Statement, where there were IÉ-IM GOs and contracted GOs.

Reporting of Accident & Incidents

92 Firstly, it is noted, that CCE-SMS-001 states that "The CCE department encourages employees to express concerns about any aspect of Occupational Safety, Track Safety, Plant & Machinery Safety, Structures Safety and Building & Facilities Safety to their managers pro-actively and at any time" (6.2.3); it is noted that "any incident "near miss" or close call is considered to be a hazard and must be reported on a "Hazard Report Form" (6.5.2).

93 CCE-SMS-007, Reporting of Accident & Incidents, Version 4.0 was published in 2018, and will be referred to as CCE-SMS-007 for the remainder of this report. CCE-SMS-007's policy is for the CCE Department to meet the statutory obligations and IÉ-IM obligations regarding reporting and investigation of accidents and incidents in order to improve the technical and workplace practices so as to reduce the level of risk in the workplace and with regard to track and structures. CCE-SMS-007 requires that all employees alert their supervisor and/or Line Manager to incident and accidents in the workplace, whether related to OS, P&MS, Track Safety or Structures Safety.

[10] 3.5.5.1, 5.3.5.4, 5.3.7.2, 5.3.7.3, 5.9.3.4, 5.10.3.4, 5.15.3.4, 5.16.3.4, 5.18.3.2, 5.18.3.3, 5.19.3.2, 5.19.3.3, 5.20.3.2, 5.20.3.3, 5.21.3.1, 5.21.3.2, 5.22.3.2, 5.22.3.3, 5.23.3.2, 5.24.3.2, 5.24.3.3, 6.11.2.2.

[11] 3.1.5.1, 3.1.7.2, 3.5.3.1, 3.6.3.1, 3.11.3.1, 3.12.3.1, 3.15.3.1, 3.16.3.1, 3.17.3.1.

94 CCE-SMS-005, Contractors Permit to Access (previously Permit-to-Work), has been operative since 2010 and currently operating under Version 5.0 published in 2018, and to be referred to as CCE-SMS-005 for the remainder of this report. CCE-SMS-005 sets out the requirements for the selection, management and monitoring of contractors at all CCE Locations that engage in minor civil engineering works for the CCE Department and/or provide plant and labour services for the maintenance and upkeep of the IÉ-IM infrastructure. In terms of 'Accident Reporting' the contractor shall immediately report all accidents (whether minor or those incurring lost time), dangerous occurrences and "near misses" as soon as possible to the IÉ-IM Line Manager or his representative on site (Section 3.14). Contractors must carry out their own formal investigation into all accidents, dangerous occurrences and "near misses", and submit written reports to the CCE Department.

IÉ Rule Book – Arrangements for T3 Possessions

Introduction

95 In terms of protection arrangements, the Section T, Part Three of the IÉ Rule Book, "Arrangements for Absolute Possessions of the Line" (this section last edited in February 2014), sets out the: principles; general instructions; instructions to PICOPs, ESs, Signalmen and the forms and certificates to be completed for the T3 Possession.

96 In terms of planning T3 Possessions, the Engineering Department requiring a T3 Possession must agree beforehand with the Operations Department the extent and duration of the T3 Possession and the location(s) of the work together with the arrangements for communications (Subsection 7.2).

97 The notice for the T3 Possession is then published in the IÉ Weekly Circular, as set out in Section T, Part Three (Subsection 7.3).

Principles

98 Some of the key principles, in terms of ensuring the safety of movements within T3 Possessions (Subsection 7.4), are outlined below:

- Normal train signalling is suspended on any line blocked by a possession;
- The possession must be protected by signals being maintained at Danger;
- Detonator protection must be provided at the limits of the possession;
- All movements within the possession must be authorised by the person specified in this Section T, Part 3.

Protection of T3 Possessions

99 In terms of protection of T3 Possessions (Subsection 8.4), the general instructions are:

- Protection must be provided by maintaining a stop signal at Danger in rear of the portion of line on which the possession will be taken
- Detonator protection must be provided.

100 For the indication of work sites (Subsection 8.5), the limits of each work site in the T3 Possession must be indicated by a marker board, see Figure 14.

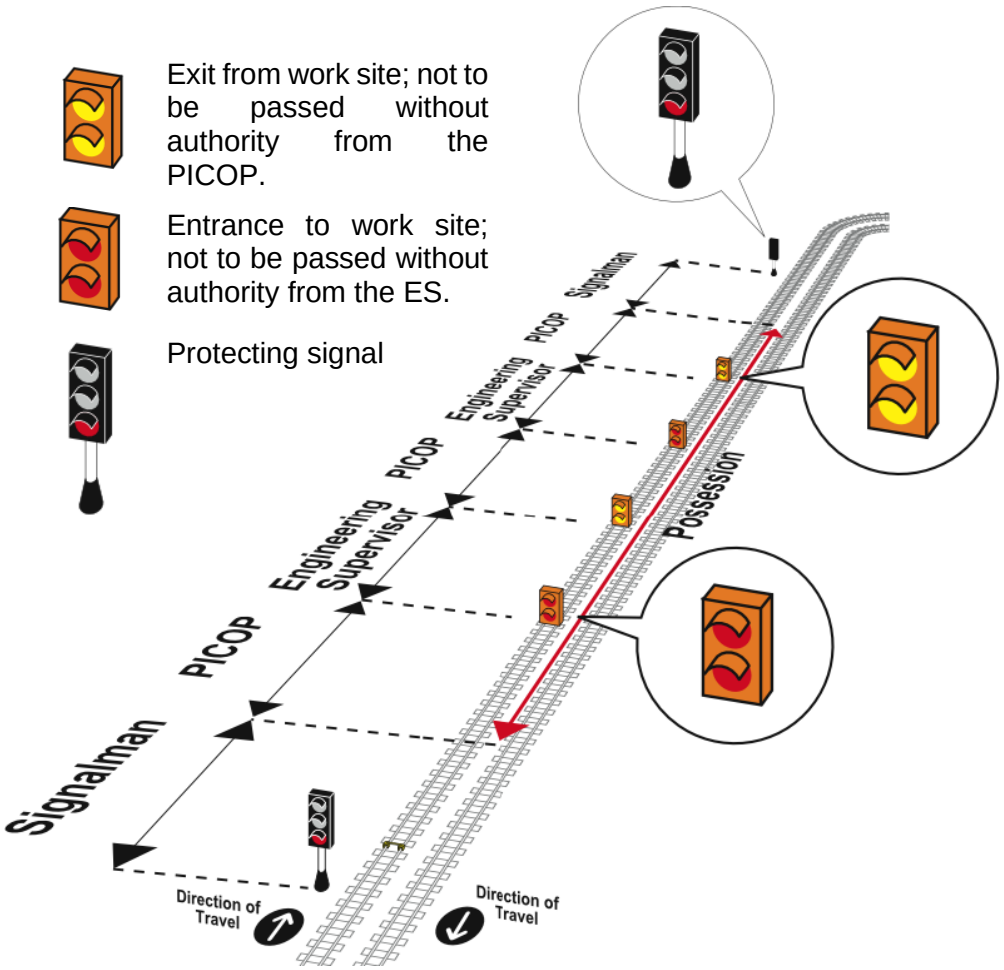


Figure 14 – Marker boards for the indication of work sites

101 In the interests of safety as well as efficiency, it is essential that communication is readily available between the PICOP and the following persons: Signalmen; Engineering Supervisors; others, as necessary. The arrangements for communications must be agreed at the pre-planning meeting (Subsection 8.6).

102 Movements within or entering a work site must be authorised by the ES. All other movements within or entering a T3 Possession must be authorised by the PICOP (Subsection 8.7).

Appointment and Instructions to ESs

103 As the actions of the ES are of importance to this investigation, the following outlines the appointment and instructions to ESs.

104 The Engineering Department concerned must appoint a certified ES (a person to be in charge of each work site under possession). The name of each ES must be given to the PICOP beforehand (Subsection 8.2).

105 The ES must: ensure that the necessary marker boards are provided to indicate the limits of your work site (Figure 14); authorise movements entering or within your work site to ensure their safety; and, ensure the work site is cleared when work is finished so that the T3 Possession may be safely given up (Subsection 10.1).

106 Prior to permitting work to start at the worksite, the ES must first obtain the PICOP's permission; record the details of this authority on the ES's Certificate; and ensure that marker boards are correctly positioned and tell the PICOP (Subsection 10.3).

Documentation related to rail stressing

CCE-TMS-422, Management of Rail Stressing Competency

107 The length of rail to be replaced on the night of the accident was identified by an Ultrasonics Recording Train as having A-Class 2 defect (meaning the defect had to be fixed within eight weeks of identification).

108 Technical Management Standard, CCE-TMS-422, "Management of Rail Stressing Competency", introduced in May 2019 (to be referred to as CCE-TMS-422 for the remainder of the report) was introduced to strengthen the competency requirements of those supervising the stressing of plain line and points & crossings. "Tab and hold" work was introduced at this stage as is defined in Technical Standard, CCE-TMS-323, "Technical Standard for the stressing of Rail", published April 2019 (to be referred to as CCE-TMS-323 for the remainder of this report) as the procedure to "replace plain rails/insulated joints in existing CWR (where the rail/weld is not broken or joint not open)".

109 CCE-TMS-422 identified three levels of competence depending on the stressing procedure[12] and "tab and hold" work (the work carried out on the night) is categorised as Level I (footnote 12).

110 To allow for interim work to continue, while the competency of staff was introduced, a provision was made for existing staff possessing "sufficient knowledge and experience" to be "permitted to continue in their role pending the progressive introduction of this standard on a phased basis". The STSE must clearly identify and record the staff to whom this applies.

111 The IM Audit Unit undertook a safety audit in July 2021 to assess the implementation and compliance of the CCE Department with CCE-TMS-422, with the report published on the 11th August 2021. The audit found that the standard was: not being implemented consistently; competency of staff not being identified and recorded as competent; and the competency not being tracked.

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[12] Level I – Stressing: Module 1 Holding Jobs (Tab and Hold) replacing rails/insulated block joints in existing CWR (where the rail/weld is not broken or joint not open).
Level II - Stressing: Module 2 (CWR stressing) includes Module 1, plus stressing in plain line including longitudinal timbers and tunnels, natural stressing, setting/resetting of breather switches.
Level III – Stressing: Module 3 (P&C stressing) Stressing through P&C layouts.
Level II and III competence is intended for technical staff.

112 Division 3 had not adopted CCE-TMS-422 despite being introduced in 2019; and despite the publication of the audit, which did not lead Division 3 to take any immediate corrective action of these issues in Division 3. Which in turn led to none of the IÉ staff rostered to work on that night of the accident (or over the previous nights) being competent to carry out the works related to the rail replacement[13].

Method Statement, replacing rails using tensors

113 The works on site on the day of the accident was managed through Method Statement "Replacing rails using tensors", reference number, D3MS2021_003 (to be referred to as the Method Statement for the remainder of this report). The Method Statement is updated annually and reviewed/approved by Regional Manager for Division 3, Heuston Station; with the last revision published on the 18th January 2021.

Figure 15 – Cover of Method Statement

114 The scope of the Method Statement is to describe the methodology of works for replacing rails using tensors.

115 The Method Statement is generic and contains an overview of procedures including: parties involved in works[14]; possession arrangements; works briefing arrangements; plant and equipment; methodology; management of site changes; control of risks and communication[15]; and, personal protective equipment.

[13] This was not unique to Division 3.

[14] Some items are "to be confirmed" in the method statement, due to it being generic.

[15] In terms of communications, the Method Statement outlines a communication plan and states that "Possessions of the line will be arranged by the PICOP as per the IÉ Rule Book.

116 In terms of the actual works, included in the Method Statement is an image of the "Tab and Hold Job Task – Check List" which does outline the activities involved in the "tab and hold" work, but not the competency requirements as set out in CCE-TMS-422 (paragraph 109).

117 The Method Statement states that the minimum length to be replaced should be 4.5 m and the maximum length for replacement as 18 m, in the case of this accident, 9 m was to be replaced.

118 The rail stressing involves attaching two clamps around the rail (inset and arrowed in Figure 16) and applying the hydraulic rail tensors (Figure 16) which use hydraulic cylinders to pull rail sections together to allow for new rail to be welded into place.

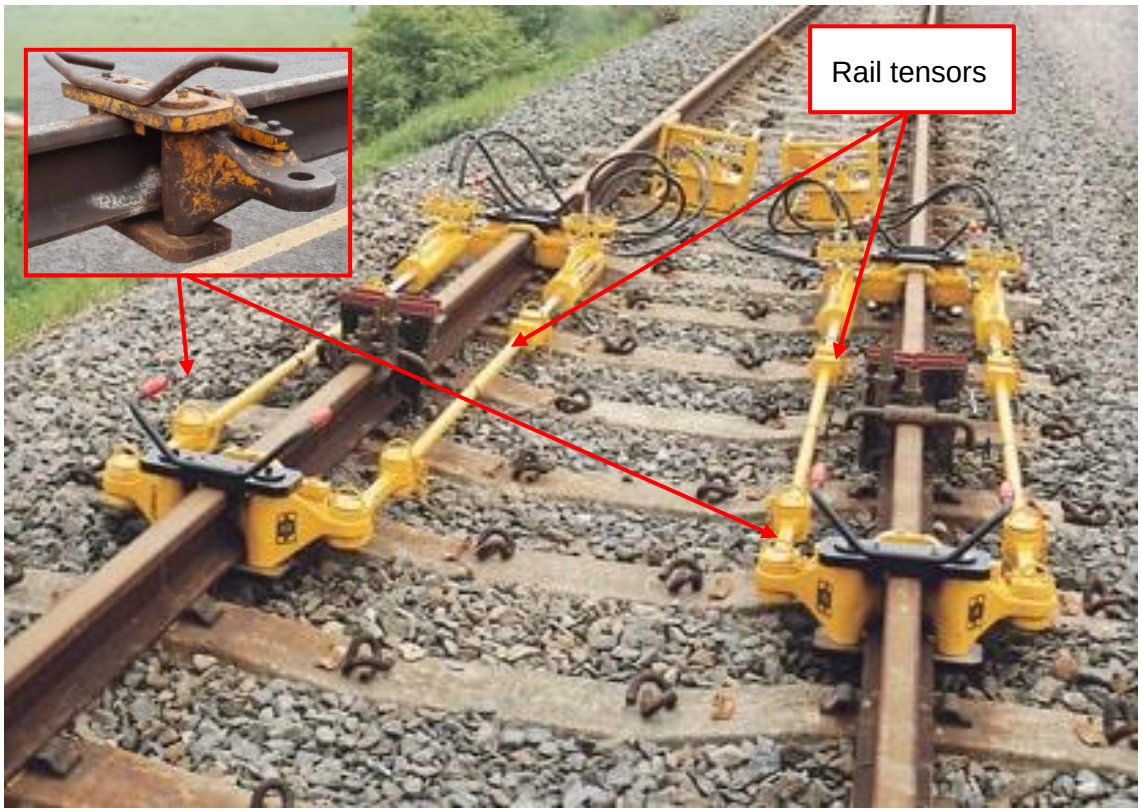

Figure 16 – Rail tensioning device

The single point of contact for communication with the Signalman while working on a line under possession, unless in an emergency situation, is the PICOP".

Events before, during and after the accident

Events before the accident

119 The notice for the T3 Possession was published in IÉ Weekly Circular 3990, week ending the 29th August 2021 i.e. Monday 23rd to Sunday 29th August 2021 (see paragraph 97).

120 The equipment required for the work had been left close to the worksite at the end of the previous night's work, in contravention of instructions from both IÉ and the welders management. Permission was given to the welding contactors by ES to leave the equipment there, despite all staff being aware that leaving such equipment in an unsecured location next to the track was not permitted (the welding contractor had previously asked PIC, however, he denied their request).

121 At approximately 23:00 hrs on the 26th August 2021 a work party (made up of three IÉ-IM staff (ES, PIC, GO) and eight contracted staff (three welders, three GOs and two RRVOs)) assembled at the IÉ Compound adjacent to the Old Curragh Railway Station, Kildare, to replace nine metres of defective rail under a T3 Possession (paragraph 107 and 116). It should be noted that IÉ-IM established that the "planned workload for the shift could easily be undertaken within the time available" i.e. there was no time pressure. A Site Safety Briefing was conducted prior to the works commencing (paragraphs 67 - 68).

122 After the briefing the ES and the GO travelled by van from the compound to the site of the defective rail; they were followed by the three contracted GOs. The PIC was instructed, by the ES, to remain at the compound with the three welders and two RRVOs and await instructions as to when the T3 Possession had been granted by the Controlling Signalman.

123 At approximately 23:59 hrs, the last scheduled train (as per the IÉ timetable), Train J219, departed Kildare for Heuston Station.

124 At approximately 00:10 hrs on the 27th August 2021, when the ES and GO arrived at the work site. The GO exited the van and removed marker boards from the rear of the van for the ES to indicate the limits of your work site (paragraph 105) once the T3 Possession was granted.

125 The ES remained in the van and phoned the PIC to see if the last timetabled train into Heuston (Train J219) had passed through the worksite; the PIC confirmed that he had seen the train pass his location while at the IÉ Compound.

Events during the accident

126 The ES did not obtain the PICOP's permission to commence work, record details of this authority in the ES's Certificate or position the marker boards at the worksite limits (as per paragraph 106).

127 Instead, the ES got out of the van and said to the IÉ GO and contracted GOs that they were "good-to-go".

128 The IÉ GO then carried the marker boards to the *cess.* The ES was to erect the marker boards and establish the work site limits (however the staff had accessed the site without the marker boards being in place).

129 At the site of the defective rail, the IÉ GO started to loosen the bolts on the rail, while one of the contracted GOs started digging the ballast out from around where the clamp was to be placed, whilst the two other contracted GOs started to attach the clamp to the Down Leg of the Up Line.

130 At 00:15 hrs, Train J283 departed Kildare Station, the train had been involved in a SPAD at Limerick Junction was returning to Heuston, Dublin, outside the normal timetable.

131 The contracted GO that was digging the ballast, turned to put his shovel down when he saw the lights of an approaching train and shouted, "train on" and all staff quickly went to a position of safety, leaving the equipment on the line.

132 Train J283 struck the clamp, which by this time, was clamped onto the rail.

133 Driver J283 brought Train J283 to a stop.

Events after the accident

Introduction

134 In terms of events after the accident, there are events related to the (these events have been separated for ease of understanding the events which occurred):

- Reporting of the accident;
- Actions on-site;
- Post-accident inspection of assets.

135 It should be noted, that when the clamp was struck, the wheel, rail and the clamp were significantly damaged (paragraphs 46 and 47, Figure 6, Figure 7); although the damage was not obvious to Driver J283.

Events after the accident in terms of reporting

136 Under CCE-SMS-007 and CCE-SMS-005, IÉ employees are required to alert their supervisors of accidents in the workplace, and contractors are required to report accidents to the IÉ Line Manager or representative, respectively (paragraphs 93 - 94). Outlined below is what happened on the night of the accident.

137 At 00:16 hrs, the ES rang the PIC to say that a train had passed through the worksite, and they had to clear the line.

138 At 00:18 hrs Driver J283 contacted the Mainline Signalman to report that Train J283 had struck something yellow on the line, and that he heard a bang, as the train approached the Curragh; and, that he saw members of staff on the Up Line who had moved off the line as Train J283 approached. After getting signal protection, Driver J283 carried out a visual examination of the train to see if there as any damage.

139 At 00:19 hrs the Signalman rang the PICOP reporting that Driver J283 stated that the train struck an object on the line and asked him to make enquiries as to what may have occurred.

140 The Signalman then contacted the Traffic Regulator at 00:20 hrs to report the occurrence.

141 At 00:21 hrs, Driver J283 contacted Mainline Signalman CTC reporting no obvious damage to the train and the Mainline Signalman CTC gave permission for Train J283 to continue to Heuston Station.

142 Around this time, the ES informed the PICOP that while they were doing preparatory work before the possession a train (Train J283) had struck some bolts that were sitting on high ballast close to the track as it passed the site.

143 At 00:23 hrs the PICOP contacted the Mainline Signalman CTC reporting that the ES thought that Train J283 struck some bolts that were on the line.

144 At 00:25 hrs the Mainline Signalman CTC, ascertains that the item struck was a yellow piece of equipment (that was not a marker board) and that Driver J283 heard a bang when the item was struck.

145 The Mainline Regulator CTC tried to contact the Division 3 Regional Manager; however, the Regional Manager was on annual leave and did not know who was acting in the role; therefore at 00:39 hrs, the Mainline Regulator CTC contacted the PWI, who was off-duty, at home, sleeping. The Mainline Regulator CTC informed the PWI of the occurrence and the fact that no possession or signal protection was in place, yet staff were on the line.

146 At 00:44 hrs, the PWI rang the PICOP, who informed him to contact the ES.

147 At 00:46 hrs the PWI rang the ES, who informed the PWI that the train had struck bolts which were on high ballast, adjacent to the track as it passed through. The PWI asked the ES twice 'Did you have a near-miss?' however, the ES assured him it was not a near-miss.

148 The PWI made the decision to remove the ES from duty. The PWI appointed the PIC to take over the ES duties, and the IÉ GO to take over the role of PIC and to continue with the rail replacement. At 00:58 hrs, the PIC contacted the PICOP to inform him that he was now taking over the ES duties.

149 At 01:01 hrs, the Mainline Regulator CTC contacted the PWI to inform him that the Duty Manager CTC was escalating the occurrence as it was now a reportable serious occurrence and that the PWI should report it to the Acting Regional Manager Division 3 (the Regional Manager was on leave). The PWI informed the Mainline Regulator CTC that he had stood down the ES.

150 At 01:14 hrs, the PWI contacted the Acting A-Class Inspector for the area; who was on a different work site and requested that he attend the accident site, make enquiries and take statements from those persons who had been on the worksite when the train passed.

151 At 01:24 hrs, the Acting A-Class Inspector contacted the now stood-down ES directly, the ES told the Acting A-Class Inspector that the work group had accessed the line early for preparatory work as he thought that there were no more trains scheduled for the night.

152 The ES said that the train may have struck bolts or some ballast (this is the first mention of striking ballast).

153 At 01:29 hrs, the Acting A-Class Inspector rang the PWI to relay what the stood-down ES had said. The Acting A-Class Inspector asked about "for cause" drugs and alcohol testing as set out in IÉ Drugs & Alcohol Policy, however, the PWI stated that he made the decision that testing was not necessary; it was found during the course of the RAIU investigation, that the Acting A-Class Inspector did not feel able to challenge this decision.

154 At 01:35 hrs, the stood-down ES rang the Acting A-Class Inspector to say that he had "found-out" that it was the clamp that had been struck.

155 At 01:38 hrs, the PWI contacted the Acting A-Class Inspector, the Acting A-Class Inspector told the PWI that a piece of the clamp had been struck; however, at the same time the PWI emailed the Regional Manager and Infrastructure Manager that staff were carrying out preparatory works outside a T3 Possession and that a train had struck high ballast or a bolt (not the clamp).

156 At 02:55 hrs the PIC (now the acting ES) rang the Acting A-Class Inspector, stating his actions in terms of conversation with the ES.

157 The IÉ GO (now the acting PIC) contacted the now stood-down ES stating there was an issue with an axle counter.

158 At 03:13 hrs the now stood-down ES contacted the Acting A-Class Inspector to inform him of this; the Acting A-Class Inspector, in turn contacted the PIC (now acting as ES), who said it was fine, however, the Acting A-Class Inspector said that he was sending out staff for Signalling, Electrical and Telecommunications (SET) staff to check.

159 The IÉ-IM Safety Department received a report of a possible near miss, and the Investigation Team requested the forward-facing CCTV footage as is normal procedure, however, the CCTV was very poor quality giving no detail into the accident, although it should be noted that the accident was at night and the CCTV would not have been expected to capture smaller items during darkness.

160 A post-accident review was conducted in Inchicore Training Facility on the 1st September, this was attended by the Head of Health and Safety IÉ-IM, the CCE Safety Manager along with the original ES, and PIC.

161 It was reported by the ES to the meeting that the clamp had been placed resting on top of high ballast adjacent to the track when it was struck by the train. Discussion took place on measures around doing preparatory work before a T3 Possession was granted.

162 The IÉ accident investigation team became aware of some discussion taking place within the company although there was no evidence to alter what had been reported on the accident.

163 On the 15th September the Head of Health and Safety (IÉ-IM) was shown a photograph of the rail that had been replaced on the 27th of August, an arrangement was made to inspect the rail with CCE staff with the relevant expertise. The Inspection was carried out on the 21st of September and a reconstruction confirmed that the stressing equipment had been clamped to the rail when it was struck by the train.

164 Further investigation located the holding clamp that had been used on the night of the 27th August, it was clearly damaged and corroborated that it had been bolted to the track and struck by the train.

165 The RAIU consider the poor reporting of the accident to be an additional observation, AO-03 (paragraph 229), which warrants safety recommendation 2023002-06 (paragraph 249).

Events after the accident at the site of the accident

166 At 00:21 hrs, the ES contacted the PIC (who was at the compound) requesting he ask the welders if they had a spare clamp and an eighteen-metre section of rail, as he might need it (the rail and clamp were significantly damaged in the collision).

167 At 00:27 hrs, conversations between the ES and PIC; and, the PIC and the welders, it was ascertained that the welders only had equipment available for the replacement of a 9 m section, but they did have a spare clamp.

168 The PIC (now acting as ES) re-briefed the work group in relation to the replacement of the 9 m of rail (which had been significantly damaged); during the briefing the contracted GOs asked to be stood down as they were badly shaken up by the accident, however, this request was denied by the PIC (now acting as ES) who felt that the staff could not be replaced at such short notice. A T3 Possession was granted at 01:00 hrs and the works commenced.

169 The PIC made the decision to move the cut positions of the rail, locations which had been marked by STSEs prior to the T3 Possession, see Figure 17, to allow for the removal of the section of rail with the Class 2 defect and the damage as a result of the clamp being struck by the train.

Figure 17 – Planned cut and actual cut

170 At 03:19 hrs the PICOP rang PIC (now acting as ES) to see if it was possible for a train to travel in the down direction on the Down road, the PIC informed the PICOP that it would be half-an-hour before the line was cleared.

171 At 04:00 hrs, the PIC (now acting as ES) rang the IÉ GO (now acting as PIC) to instruct him to lift the marker boards.

172 At 04:52 hrs the PIC (now acting as ES) cancelled the work site and rang the PICOP to hand back the road.

173 At 04:55 hrs the PICOP handed the road back clear and safe for traffic.

174 After the works were completed, the PIC (now acting as ES) completed a “Shift Report”, as is normal practice. The report did not reference the collision or the changing of the cutting positions.

175 The contracted staff did not report the accident to their management, as they assumed that IÉ-IM had followed the correct reporting procedures.

Events after the accident in terms of the inspection of Train J283

176 Train J283 was visually inspected by Driver J283 immediately following the accident, no obvious damage to the train was identified (paragraph 141).

177 A few hours later, a report was sent to Heuston CME Platform Support stating that Train J283 with Generator Car (GC) 4003 leading (to be referred to as Train with GC 4003 for this section of the report) had struck an object on the mainline (at this stage it was thought to be a bolt). The train was inspected at Inchicore Depot and no faults were found. The CME Vehicle Maintenance Instruction (VMI) Post Incident Examination (IE Z1MK4A0001) should have been carried out, at this stage, however, it was not, due to the fact that CME were informed that a bolt had struck the train.

178 A number of other inspections were carried out on Train with GC 4003:

- 30th August 2021 – During planned Maintenance Examination, the sanding bracket on GC 4003, non-driver side, was found to be damaged and was replaced;
- 2nd and 6th September 2021 – As part of the ongoing investigation into the incident, an inspection found no damage to the train;
- 14th September 2021 – During planned Maintenance Examination; no defects were found, and all parameters were within tolerance;
- 22nd September 2021 – On notification of the severity of the accident[16], Train with GC 4003 was inspected at Inchicore Depot and damage to wheel on GC 4003 identified. A full wheel assessment on Train with GC 4003 and Locomotive 223 was carried out the next day. Minor damage to the wheel was identified, however, as a precautionary measure, a decision was made to change a bogie on GC 4003.

179 In total, Train J283 was inspected five times prior to the faults being detected; the RAIU consider this to be an additional observation, AO-04 (paragraph 229). As IÉ-RU have taken actions to address this (paragraph 236) a safety recommendation is not warranted (paragraph 243).

[16] On the 21st September 2021, the Head of Health and Safety IÉ-IM informed IÉ-RU CME that Train J283 had hit a clamp on the rail and a specific inspection of the front right-hand-side wheel on GC 4003 was strongly suggested as a matter of urgency. Staff from CME Cork inspected the train on arrival into Cork Station and photographs were circulated in Running Shed Technical Group. The train was removed from service and sent to Inchicore for inspection, where the damage was promptly discovered.

Events after the accident in terms of the inspection of rail at the accident location

180 The IÉ-IM Head of Health & Safety arranged to visit the site of the accident on the afternoon of the 27th August, accompanied by the PWI where it was evident the position of the cuts was moved by 1.9 m (Figure 17).

181 A decision was made to identify the scrap/damaged rail which had been replaced on the night. On the 15th September the IÉ-IM Head of Health & Safety received a photograph (see Figure 18) from the CCE Safety Manager which showed the rail concerned with some damage to the bottom of the rail, the rail was transported to Portlaoise Rail and Sleeper Depot the following day under strict loading instructions for further analysis.

Figure 18 – Damaged rail

182 On the 21st September, the IÉ-IM investigation team along with CCE staff with expertise in stressing equipment convened in Portlaoise Rail and Sleeper Depot and carried out a reconstruction with identical equipment to that which was struck on the night of the accident. The reconstruction confirmed, that in all likelihood, the stressing equipment had been clamped to the rail when it was struck by Train J283.

Events after the accident in terms of the clamp

183 The train struck the clamp fixed to rail, shearing it into at least two pieces. One piece (approximately half of the clamp) was subsequently recovered but the rest of the clamp was not recovered (see Figure 7).

Similar occurrences

IÉ Member of staff fell from RRV bucket, Clonygowan, 19th May 2021

184 The RAIU has outlined the following accident as a similar occurrence, IÉ-IM member of staff fell from RRV bucket at Clonygowan, Offaly, on the 19th May 2021. The RAIU have outlined this accident as there were:

- Blatant rule breaks in working procedures;
- Varying degrees of non-compliance with safety rules and regulations within work sites;
- Issues related to authority gradient were also evident where the staff involved did not feel empowered to challenge the suggestion of a supervisor to behave in an unsafe manner.

185 In addition, the internal IÉ-IM investigation into this accident, re-states some of the internal safety recommendation made from the Clonygowan accident (paragraph 232).

186 In summary, on the 19th May 2021, a Road Rail Vehicle (RRV) was travelling to a worksite within a T3 Possession between Portarlington and Clonnydonnin. The RRV had a clamshell bucket attached and was carrying a four-foot bucket within the jaws of the clamshell bucket. A decision was made that two IÉ-IM members of staff were to travel to the work site in the four-foot bucket. The third member of staff sat up on the outside of the machine.

187 As the RRV was approaching an overbridge the RRV Operative (RRVO) slowed the speed of the RRV down and extended the arm to ensure no part of the machine came in contact with the bridge. After the RRV had passed under the overbridge, the four-foot bucket dropped from the clamshell bucket causing the two IÉ members of staff to fall from the four-foot bucket, resulting in one of them sustaining leg injuries.

188 The RRVO immediately brought the RRV to a stop and the staff present rendered assistance to the injured member of staff. The emergency services were contacted and attended the scene. The IÉ member of staff received medical attention on site and was later removed from the site by ambulance to the Midland Regional Hospital, Tullamore.

189 IÉ determined that the immediate cause of the accident was: “Two members of IÉ staff were being carried in the four-foot bucket from the access point at OBA10 to the work site in violation of the Clause 2.1 of Section A of the Iarnród Éireann Rule Book “do not endanger yourself or others””.

190 Causal factors were identified by IÉ-IM as:

- A decision was made by the IÉ members of staff involved, led by the A-Class Inspector that he and one of the IÉ Contract Platelayers would travel in the four foot bucket from the access point to the work site. The other IÉ Contract Platelayer decided travel on the outside of the RRV instead of the designated seat provided in the cab of the RRV;
- The RRVO allowed the IÉ staff to travel in the bucket and on the outside of the RRV, rather than in the designated seat as outlined in the training provided to RRVOs by IÉ and Risk Assessment 11 Heavy Maintenance using RRVs;
- The appropriate site and work briefings were not carried out prior to the work commencing;
- All of the staff involved, who were all assessed as competent, participated in this unsafe practice;
- The staff involved did not feel empowered to challenge the suggestion of the A-Class Inspector to behave in an unsafe manner.

191 Underlying causes were identified as:

- The contractor did not have a culture established to encourage staff to feedback safety concerns or issues, nor did the contractor have a process in place to enable his staff to report any unsafe practices;
- Evidence provided to the investigation pointed to varying degrees of non-compliance with safety rules and regulations within work sites[17];
- The culture in Division 21 resulted in the staff involved not feeling empowered to challenge the suggestion of the A-Class Inspector for them to behave in an unsafe manner;

[17] The RAIU further queried this statement and the IÉ-IM response to the RAIU on the 5th September 2022 was “During the interviews, that took place during the course of the investigation, different interviewees indicated anecdotally of instances of non-compliance with safety rules and regulations within work sites however none were willing or able to provide dates and location of such instances. To address this Iarnród Éireann have introduced a confidential reporting system for all employees who wish to raise safety concerns anonymously”.

- There was a lack of focus on the communication of safety messages and the importance of lessons learnt;
- There was a lack of control processes in place to provide assurances that work had been conducted in the prescribed manner;
- There was no process in place to manage or report deviations from the documented plan of work.

192 A number of root causes were also identified, related to rule breaks.

193 The report made thirteen safety recommendations, including:

- The Chief Executive Officer IÉ to consider the feasibility of establishing an independent safety assurance system for the application of all elements of IÉ SMSs. The learning from this will be rolled out throughout IÉ;
- The CCE to develop an appropriate process for the selection, training and on-going monitoring of the competence of all Supervisors in line with best practice;
- The Head of Health and Safety IM to arrange for a re-briefing/re-issue of instructions of how staff are to report and respond to an accident on the line;
- The CCE to review existing engagement process with Plant Hire Contractors, so as to ensure that Plant Hire Contractors are scheduled to attend appropriate forums nationwide to report and discuss safety related issues and that their attendance is recorded;
- The CCE to arrange for all Supervisors to receive upskilling on people management, behavioural safety and safety leadership;
- The Director Health and Safety to examine the feasibility of the introduction of an enhanced confidential reporting system for staff and contractor staff to report safety related concerns across the network;
- The Chief Executive Officer IÉ to examine the feasibility of introducing a policy that outlines IÉ response to incidents of reckless violation that endangers the safety of people or assets on the network;
- The Director of Health and Safety should arrange to examine the feasibility of developing a repository for risk assessments that refer to roles and tasks i.e. PIC, ES, PICOP Driver and then reference or outline these risk assessments during training and refresher training provided by IÉ. This is to ensure that staff undertaking these roles are aware of the relevant risks and controls for these tasks;

- The Director of Health and Safety should arrange to examine the feasibility of holding an annual forum inviting investigators, assessors, compliance officers and trainers, from both IM and RU, to discuss and debate what is occurring on the ground as discovered during investigations, assessments and audits and if these issues could be addressed in the training content going forward.

Analysis

T3 Possessions Access – IÉ Rule Book

194 Section T, Part Three of the IÉ Rule Book sets out the principles and instructions in relation to T3 Possessions (paragraphs 95 - 106), in particular, there are robust requirements in terms of protection of possessions through signalling, marker boards, detonators and communications (paragraphs 98, 99, 101, 102, 105). The role of the ES is clearly defined (paragraph 105) in terms of allowing staff enter and exit possessions and work sites (paragraph 102). In addition, there are a number of documents that have to be completed prior to taking T3 Possessions (paragraph 106).

195 In terms of the actions of the ES against the requirements Section T, Part Three of the IÉ Rule Book, the ES did not provide the protection of the T3 Possession in that the ES did not:

- Wait for the PICOP to authorise the entering of staff into the possession and complete the associated documentation (paragraphs 102, 106 and 126);
- Position the marker boards prior to commencing work (paragraphs 105, 106, 126 and 128);
- Ensure the safety of the work party (paragraph 106) by allowing them to access the work site, knowing the possession was not granted (paragraph 127).

196 The ES made the above violations, after he checked with the PIC that the last timetabled train (Train J219) had passed (paragraph 125); the ES incorrectly thought that no other trains were going to pass through the worksite, however, a special movement was authorised to allow train (Train J283) was arranged to go through the work site (paragraph 129).

197 Had the ES followed the requirements set out in the IÉ Rule Book, i.e. waited for the PICOP to authorise entry and ensure the safety of the work party, the accident would not have occurred.

T3 Possession Access – Safety Tours and Compliance Verification

198 CCE-SMS-008 is the process to monitor safety to reduce the level of risk in the workplace / worksite, by observing safety first hand and ensuring works are carried out in accordance with CCE Documentation and other relevant documentation (paragraphs 69 - 70). CCE-SMS-001 sets out the frequencies for the Divisions.

199 The RAIU noted that Guideline 1: Safe Possession Management, asks is the movements are planned & safely controlled, and procedures being followed, however, the Safety Tour Form does not require this detail to be inputting in the Safety Tour Form (paragraphs 78 - 79). If this is not required to be inputted the person completing the form does not have to attend the work site until after the T3 Possession has commenced. Therefore the RAIU consider CCE-SMS-008 ineffective in terms of checking possessions are granted prior to works commencing.

200 In terms of general rule breaking, CCE-SMS-008 does not appear to be effective at capturing the rule breaking. For examples, it is unlikely that this was the first time a T3 Possession had been accessed prior to the possession being granted.

201 In addition, the equipment required for the work had been left close to the worksite at the end of the previous night's work, in contravention of instructions from both IÉ and the welders management; permission had been given by the ES (paragraph 120). Although there is no evidence of items being routinely left near the railway, it is unlikely the first time this occurred. Safety Tours may have captured this, in terms of housekeeping of small plant and equipment, Guideline 5: Small Plant and Equipment Affecting Safety (paragraph 83).

202 The examples of Safety Tour Forms reviewed by the RAIU were generally completed in full, however, the information is very limited with little "other observations made"; in additional the forms were not always signed by the managers or signed after a protracted period of time (paragraphs 82 - 85)[18].

203 Blatant rule breaks were also evident in the Clonygowan accident on the 19th May 2021, where there also was some evidence of varying degrees of non-compliance with safety rules and regulations within work sites (paragraph 191).

[18] IÉ have since reviewed the Safety Tour Forms, which is discussed in paragraph 234.

Competency of Staff

204 CCE-SMS-001 set out the policies, principles, responsibilities and accountabilities for staff in the CCE Department, whereby accountable line managers must ensure staff are competent (paragraph 54).

205 CCE-SMS-001 places accountabilities and responsibilities on the CCE (paragraph 55), Technical Manager (paragraph 56), STSEs (paragraph 57), Regional Manager (paragraph 60), PWI (paragraph 62), Competency Manager (paragraph 63) and Training Manager (paragraph 64) to ensure the competency of staff or ensure works are carried out in accordance with the CCE Technical Documentation i.e. CCE-TMS-422 would be included here.

206 None of the staff present on the night of the accident had the required competency as set out by CCE-TMS-422 (paragraphs 107 - 112); and the competency was not set out in the Method Statement for the works (paragraphs 113 - 119). This is despite, CCE-TMS-422 being introduced two years before the accident and an audit specifically identifying that Division 3 were not meeting the requirements of CCE-TMS-422 (paragraphs 111 - 112).

207 It appears that CCE-SMS-001 is too broad in terms of who is actually accountable for competency of staff, with apparently all management staff, in some form, responsible for all staff competencies.

208 CCE-SMS-008, Guidelines for Completing the CCE Safety Tour Form, Guideline 1: Safe Possession Management, the guidance part of the Safety Tour Form asks: Are all staff trained and certified for the tasks they are undertaking? (paragraph 78). However, the Safety Tour Form does not allow for this information to be recorded.

Quality of Work

209 The IÉ-IM Head of Health & Safety and PWI visited the site of the accident on the afternoon of the 27th August, where it was evident the position of the cuts was moved by 1.9 m (paragraph 180); and this was not recorded in the “Shift Report” completed by the PIC, then acting as ES (paragraph 174).

210 It is not clear when STSEs would have noticed that the cut positions had been moved, had this visit not been carried out; despite Accountable Line Managers/ STSEs being directly accountable for the quality of work that affects track safety (paragraphs 54 and 81, 86) as set out in CCE-SMS-001 and CCE-SMS-008. CCE-SMS-008 does not appear to have stringent checks in relation to the quality of works carried out (paragraph 81).

211 CCE-SMS-008 references Contractor compliance to Method Statements nine times (CCE-SMS-001 mentions Contractor compliance with Method Statements twenty-two times (paragraph 89)), stating that regular Safety Tours are done to verify that Contractors using contracted or their own equipment does so in a manner consistent with their method statement (paragraph 90); however, the Method Statement was an IÉ-IM Method Statement (paragraph 113) and therefore not required to be verified according to CCE-SMS-008.

212 The RAIU consider these findings to be an additional observation, AO-05 (paragraph 229), which warrants a safety recommendation 2023002-07 (paragraph 250).

Actions of the IÉ-IM staff on the night of the accident

Supervision of the work party by the ES and PIC

213 In terms of the work party, when the work party heard, from the ES, that they were "good-to-go" (paragraph 127), they assumed that the PICOP had authorised entry of staff to the possession and commenced their work, digging out ballast and placing a clamp on the line (paragraph 128).

214 This indicates a level of trust in the position of the ES, whereby staff did not query the ES's instructions, however, there is also an element of *"authority gradient",* whereby there is an established authority hierarchy of IÉ-IM supervisors over IÉ-IM GOs and contracted staff.

215 This is also visible after the accident when the GOs asked the PIC (who took over the role of ES) to be stood down due to the fact that they were badly shaken up due to the near miss with Train J283, however, their request was declined and they were to continue working without further challenging the PIC (paragraph 168).

216 Authority gradient was also evident in another Division, during the Clonygowan accident on the 19th May 2021, where the staff involved did not feel empowered to challenge the suggestion of a supervisor to behave in an unsafe manner (paragraph 191).

Post-accident management & reporting

217 After the accident, there was some confusion in relation to who the Mainline Regulator CTC was to contact as the Division 3 Regional Manager was on leave (paragraph 145). The PWI was then contacted, however, the PWI can only be accountable "during his working hours" according to CCE-SMS-001 (paragraph 61), and he was off-duty, asleep at the time of the accident (paragraph 145).

218 The Acting A-Class Inspector did enquire of the PWI in relation to "for cause" drugs and alcohol testing, with the PWI stating that it was not required, and the Acting A-Class Inspector not feeling able to challenge this decision (paragraph 153), again indicating an element of authority gradient.

Actions to conceal the accident

219 The actions that the ES took after the accident in terms of, firstly, not correctly reporting the full extent of the accident, reporting that Train J283 had struck some bolts (paragraph 142) in contravention to CCE-SMS-007; and secondly, attempting to source an eighteen metre section of track and another clamp (paragraph 166), indicate that the ES was attempting to conceal his previous actions in terms of allowing the work party access the work site prior to the T3 Possession being authorised. As the contracted staff assumed the accident was reported, they did not report the accident as set out in CCE-SMS-005. The RAIU consider the poor reporting of the accident to be an additional observation, AO-03 (paragraph 229), which warrants safety recommendation 2023002-06 (paragraph 249).

220 As the rail was damaged, the PIC (now acting as ES) made the decision to move the marked cut positions of the rail by 1.9 m (paragraph 169), however; the PIC did not make any reference to this (or the collision) in the completed “Shift Report” (paragraph 174). CCE-SMS-008 does not appear to have any checks in relation to works carried out (paragraph 81). On the night of the accident, the PIC made the decision to move the cut positions of the rail, locations which had been marked by STSEs prior to the T3 Possession to allow for the removal of the section of rail with the Class 2 defect and the damage as a result of the clamp being struck by the train (paragraph 169). The IÉ-IM Head of Health & Safety arranged to visit the site of the accident on the afternoon of the 27th August, accompanied by the PWI where it was evident the position of the cuts was moved by 1.9 m (paragraph 180).

Conclusion

Summary of conclusions

221 Section T, Part Three of the IÉ Rule Book sets out the principles and instructions in relation to T3 Possession which the RAIU have found to be robust, when followed, in the management of safety in work sites. The ES did not follow the instructions; had the instructions been followed the accident would not have occurred (paragraphs 194 - 197).

222 One of the functions of the Safety Tours as set out in CCE-SMS-008 is to verify Safe Possession Management (Guideline 1); however, the RAIU found that there are discrepancies in the guidance and the Safety Tour Forms (paragraph 78, 79, 83, 81) which meant that supervisors do not have to be present prior to possessions being granted (paragraph 198). In addition, this would mean that in terms of leaving equipment near the line, i.e. poor housekeeping (Guideline 5), this is unlikely to be seen by supervisors (paragraphs 83 and 120).

223 In terms of competency of staff, it appears that CCE-SMS-001 is too broad, in that all management staff are responsible for all competencies; despite this, none of the staff present on the night of the accident, carrying out the rail replacement work, had the required competency as set out in CCE-TMS-422, even though an audit had been carried out compelling the CCE Department to actively train staff in the required competencies (paragraphs 204 - 207). Again, CCE-SMS-008 is not conducive to checking for staff competencies and checks against IÉ Method Statement's i.e. the focus is on contractors (paragraphs 208 - 209).

224 In terms of actions of staff on the night of the accident, the ES broke a number of IÉ Rule Book instructions (paragraph 221), using a form of authority gradient to instruct staff to access the railway line; this was also evident with the PIC who insisted the work continue despite the requests for the work detail to cease work (paragraph 215). The post-accident management of staff, put an onus on the PWI to manage the accident, despite, him being off duty (paragraph 217). Again, procedures weren't followed by the PWI in terms of testing for drugs and alcohol, and the Acting A-Class Inspector couldn't challenge the PWI on this point i.e. authority gradient (paragraph 218).

Causal, contributing and systemic factors

225 On the evening of the 26th August 2021 the work detail was almost struck by Train J283 who had accessed the railway line without a T3 Possession being in place; Train J283 struck a clamp which had been left on the line by the work crew.

226 The causal factors associated with the accident are:

- CaF-01 – The ES instructed the work party to access the work site without the authorisation of the PICOP; a violation of the requirements set out in Section T, Part Three, of the IÉ Rule Book. The ES erroneously thought that the last train had passed through the worksite (paragraph 195 - 197);
- CaF-02 – The work detail entered the work site, as they accepted the authority of the IÉ-IM ES's position (both IÉ-IM and contracted staff), and assumed they were safe to enter the T3 Possession. This level of acceptance indicates an element of "authority gradient", which is further emphasised when the PIC (who took over the roles of the ES), rejected the GOs requests to cease work after the accident; and they re-commenced working (paragraph 213).

227 A contributing factor is:

- CoF-01 – The Safety Tours, as set out in CCE-SMS-008, were ineffective at capturing rule breaks prior to possessions being granted, such as work parties accessing the railway before the possession being granted and equipment left near the railway line overnight (paragraph 222).

228 A systemic factor is:

- SF-01 – The Safety Tour Form differs from the checks required to be completed in the Guidelines for Safe Possession Management (see Figure 11), the guidance part of the Safety Tour Form asks if the movements are planned and safely controlled, however, this information does not have to be recorded.

Additional observations

229 The RAIU made the following additional observations:

- AO-01 – The RAIU found that IÉ-IM were slow to respond to RFIs submitted to the RAIU, and in some cases the wrong information was submitted, which extended the RAIU investigation over the twelve-month recommended publication date.
- AO-02 – None of the staff present on the night of the accident, carrying out the rail replacement works, had the required competency as set out in CCE-TMS-422, even though an audit had been carried out compelling the CCE Department to actively train staff in the required competencies. Further to competency management: CCE-SMS-001 is too broad; CCE-SMS-008 is not conducive to checking for staff competencies and checks against IÉ Method Statement's i.e. the focus is on contractors.
- AO-03 – The accident was not reported, in full, in the first instance, as set out in CCE-SMS-005 and CCE-SMS-007 (paragraph 136); and the full scale only came to light due to the efforts of the internal IÉ Safety Department (paragraphs 159 - 164). The contractors and IÉ-IM GO felt unable to challenge the IÉ-IM supervisors, a form, of authority gradient) (paragraph 168).
- AO-04 – Train J283 was inspected five times after the accident before the damage to wheel on GC 4003 was identified (paragraph 179).
- AO-05 - The section of rail to be replaced was moved; and not recorded in the "Shift Report" completed by the PIC, then acting as ES; and it is not clear when STSEs would have noticed despite being directly accountable for the quality of work that affects track safety as set out in CCE-SMS-001 and CCE-SMS-008. CCE-SMS-008 does not appear to have stringent checks in relation to the quality of works carried out; with its main focus being on the contractors' method statements (paragraphs 209 - 212).

Measures taken since the accident

Measures taken by IÉ-IM since the accident

Report of investigation into the accident

230 On the 18th October 2021, IÉ-IM engaged safety consultants Arthur D. Little Limited to lead the internal investigation into the accident. A report of investigation "Train J283 collision with equipment attached to the rail at 28 miles 1540 yards between Newbridge and Kildare on 27th August 2021" was published on the 11th January 2022. This report identified an immediate cause and a number of causal and underlying causes.

231 Based on these IÉ-IM commenced/ carried out a number of safety actions, including:

- The Head of IM Safety, IM Dublin Division, CCE and CCE Safety Manager held a post-accident review with ES and PIC on the 1st September 2021;
- Five IÉ-IM staff were suspended, without prejudice, as the investigation progressed. Subsequently, two members of IÉ-IM staff were able to resume their substantive roles.
- The Manager CTC has updated the arrangements to keep the on-call list up to date for organisational changes, nominated deputies and for periods of leave/planned absence;
- Two Safety Alerts were issued by the IÉ-IM Safety Department on 2nd September and 27th September 2021 highlighting the accident and the importance of following rules regulations & procedures, respectively;
- CCE has commenced a process where line managers present an initial report and lessons learned to the CCE Safety Steering Group post-accident (21/09/21);
- Widespread communication around the "10 Golden Rules CCE" with a letter issued to each member of CCE staff reminding of requirements around safety.

232 IÉ-IM restated a number of recommendations from the Clonygowan Report:

- The Chief Executive Officer IÉ to examine the feasibility of introducing a policy that outlines IÉ response to incidents of reckless violation that endangers the safety of people or assets on the network;
- The CCE to arrange for all Supervisors to receive upskilling on people management, behavioural safety and safety leadership. Consider extending this recommendation to beyond the "Supervisor" grade to include those responsible for other staff and contractors;

- The Director Health and Safety to examine the feasibility of the introduction of an enhanced confidential reporting system for staff and contractor staff to report safety related concerns across the network;
- The Head of Health and Safety IM to arrange for a re-briefing/re-issue of instructions of how staff are to report and respond to an accident on the line.

233 A number of new safety recommendations were also made:

- A number of staff were disciplined and sanctioned within the CCE and CME; and additional training was also given;
- The CCE to research and assess the feasibility of which current technologies are available and to progress their trialling/adoption across IÉ, to support enhanced control and monitoring of when and how IÉ staff and contractors accessing the infrastructure, to provide assurance that staff are not working on the line without possession or other suitable protections;
- The CCE to promote and encourage frontline staff and contractor staff to be capable of, and confident to raise safety challenges with IÉ supervisors and team leaders, as well as close-calls and incident reports;
- The CCE to establish a system to promote and encourage sensible and efficient sharing of information across IÉ and with contractors to support swift response and investigation into incidents;
- The Head of Health & Safety IM to develop an operating procedure which provides guidance on the level of welfare support which should be provided to staff and contractors following incidents;
- The CME should review the post-incident examination instructions to provide guidance on all vital components that need to be examined;
- The CCE to confirm that the assurance and leadership arrangements in Division 3 are effective and able to detect failures in the implementation of standards and controls. Regional Manager to get corrective coaching on the monitoring of the implementation of the SMS and TMS;
- The Regional Manager for Division 3 to provide evidence that the Method Statement is updated to reflect the requirements of CCE-TMS-422. The Regional Manager to provide evidence that there is an effective system to provide assurances that all the required competencies required for the completion of tasks are actively managed and implemented in Division 3;

- The CCE to confirm that standard CCE-TMS-422 is implemented and that any deviations have been subject to risk assessment and approval;
- The CCE to confirm that there are no other CCE standards that have not been fully implemented or where deviations have not been subject to risk assessment and approval.

Safety Tour Forms

234 The RAIU reviewed the new version of the Safety Tour Form as part of this investigation. The forms have improved, in that they are digital, the date and time are to be inserted, and photographs can be added. There is also more space for "other observations" which the supervisors appear to be utilising. However, the questions remain the same as those on the original Safety Tour Form, and the Guideline questions are not included.

Iarnród Éireann Irish Rail

ASSET MANAGEMENT
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Safety Tour Possession Management

Work Order Number 530615814	**Work Order Description** DUB-RM2-SAFETY-Safety Tour - DUB-RM2 - P2
Equipment Reference 30163498	**Equipment Description** DUB-RM2-SAFETY - DUB-RM2-SAFETY
User [redacted]	**Work Group** DUB-RM2
Completion Date Feb 23, 2022	**Completion Time** 04:27
Summary Description DUB-RM2-SAFETY-Safety Tour - DUB-RM2 - P2	

GUIDELINE 1: SAFE POSSESSION MANAGEMENT	
HIDDEN Text for subscript order title	SAFE POSSESSION MANAGEMENT
HIDDEN Maintenance Activity Type	S11
Where/when was possession management observed?	ES worksite CLRP 22/2/22 25.5mp to 26mp
Are all possession staff in place?	YES
Are all worksite & possession marker boards in place?	YES
Are all staff properly briefed?	YES
Is safety critical communication adequate?	YES
Do you wish to create a Safety Action Item (IN26)?	NO
Other observations?	ES [redacted] badges worn. Very good information on the site. Was also aware of program of work for the week.
Do you wish to take a photograph?	YES

PHOTOGRAPHS (1)

Figure 19 – Example of new Safety Tour Form

CCE-TMS-422, Management of Stressing Competency

235 CCE have updated CCE-TMS-422, now entitled “Management of Stressing Competence”, which was published on the 28th November 2022 to clarify the process of achieving and maintaining competence in stressing of rail. However, at the time of publication of this report, it is not known if all relevant staff are competent.

Vehicle Maintenance Instruction, Post Incident Examination

236 As a result of the damage to the wheel not being identified until twenty-five days after the accident (paragraphs 176 - 179), the IÉ-RU CME updated their VMIs, entitled “Post Incident Examination” for the relevant fleets, and issued them on the 19th April 2022. Further, more robust, inspections in terms of the wheels (in particular the leading and trailing axle wheel), underframe and bogie have been added. In addition, a further examination of the consist for damage has been added with support from Fleet Technical Services available, where required.

Measures taken by the CRR since the accident

237 The CRR, carried out a post occurrence inspection, entitled "Train collision with stressing equipment between 28 ¾ and 29 milepost (Newbridge – Kildare section)", issued on the 17th January 2022. As a result, the CRR made nine finding, primarily related to the deficiencies in the IÉ-IM's method statements, taking post-accident witness statements and violations of safety rules. As a result the CRR identified the following *minor non-compliance* in terms of the IÉ Rule Book*: "*There have been a small but not insignificant number of blatant rule book violations and by association IÉ-IM are considered non-compliant with s. 36 of the Railway Safety Act 2005, as amended. IÉ-IM must take steps to understand why violations are being made and implement measures to prevent further violations of rules, through education, through improved awareness of legal requirements of its staff and adequate internal monitoring of tasks".

238 In addition to the above minor non-compliance, the CRR made/ re-iterated the following *actions required*:

- IÉ-IM (CCE) should review its method statement production and content standardising where possible but including sections on hand tools and the means of getting equipment and if necessary, personnel to sites of work. CCE should also review the process by which method statements are produced, reviewed, and approved.
- IÉ-IM should review its method of taking/receiving witness statements, perhaps developing a standard template that prompts both the individual taking the statement as to the important items to consider but also to the person providing the statement with the purpose of soliciting as much information as possible.

239 IÉ-IM are in the process of addressing the outcomes (minor non-compliance and actions required items) and the CRR is monitoring their progress.

Safety Recommendations

Introduction to safety recommendation

240 In accordance with the European Union (Railway Safety) (Reporting and Investigation of Serious Accidents, Accidents and Incidents) Regulations 2020), recommendations are addressed to the national safety authority, the Commission for Railway Regulation (CRR). The recommendation is directed to the party identified in each recommendation.

Absence of safety recommendations due to measures already taken

241 Had the ES followed the requirements set out in the IÉ Rule Book, i.e. waited for the PICOP to authorise entry and ensure safety of the work party, the accident would not have occurred (paragraph 221); therefore no recommendations are warranted in relation to the IÉ Rule Book.

242 In terms of the actions of staff on the day of the accident, which were in contravention with the IÉ Rule Book and the issues surrounding the reporting of accident, a number of staff were suspended and no longer permitted to perform roles involving safety responsibilities; in addition, remaining staff were briefed on the accident and a Safety Alert was issued network wide (paragraphs 231 - 232). No further safety recommendation is warranted in terms of staffing sanctions.

243 As a result of the updated, more robust, VMI, Post Incident Examination (paragraph 236), the RAIU consider that this addresses additional observation, AO-04 (paragraph 229) and no safety recommendation is warranted.

Safety Recommendations as a result of the accident

Safety recommendations related to T3 Possessions

244 The ES instructed the work party to access the T3 Possession to enter onto the work site (as the ES erroneously thought that the last train had passed through the worksite), without the authorisation of the PICOP; a violation of the requirements set out in the IÉ Rule Book. The work party entered the work site, as they accepted authority of the IÉ-IM ES's position, and assumed they were safe to enter the T3 Possession. This level of acceptance indicates an element of "authority gradient". In order to address this, the RAIU consider that some form of Authority Number[19] should be issued, by the Signalman, and all staff members working, onsite, should have this Authority Number prior to accessing the T3 Possession; as a result, the RAIU make the following safety recommendation to address causal factor, CaF-01:

Safety Recommendation 2023002-01

IÉ-IM should consider developing a system, whereby Signalmen must provide a Unique Possession Authority Number, or similar, when authorising T3 Possessions to the PICOP; this number or safeguard should be provided to all staff prior to entering a T3 Possession.

[19] Presently, Signalman issue Authority Numbers to drivers whenever a driver has to pass a signal at Danger or make a wrong direction movement for which a signal is not provided; this Authority Number is entered onto an Authority Form which states “Train No ..... authorised to pass Signal No ..... at Danger and proceed to .....”.

245 This accident illustrated blatant disregard for the IÉ Rule Book, and the events which occurred afterwards, in terms of attempting to conceal the severity of the accident, indicate that the level of supervision, at the time of the accident, was not appropriate. This is also evident through the accident at Clonygowan, where there was also deliberate rule breaking by IÉ-IM staff members (paragraph 186 - 193); and, the anecdotal instances of non-compliance with the safety rules and regulations within work sites (paragraph 191). The RAIU consider that improvements must be made for the short, medium and long term to address supervision. The Safety Tours, as set out in CCE-SMS-008, were ineffective at capturing rule breaks prior to possessions being granted, such as work parties accessing the railway before the possession being granted and equipment left near the railway line overnight. As a result, the RAIU make the following recommendation to address contributory factor, CoF-01 and systemic factor, SF-01:

Safety Recommendation 2023002-02

2023002-02 – IÉ-IM should review the current system of supervising and monitoring T3 Possessions, in terms of possession arrangements (e.g. Authority Number) and safety documentation (e.g. method statements); this review should identify improvements in terms of managing T3 Possessions. At a minimum, IÉ-IM should:

- **Expedite an increase in the supervision and monitoring of T3 Possessions by Engineering Department staff through updating CCE-SMS-001, specifically increasing monitoring prior to possessions being granted (while the IÉ-IM review and updating of supervision and monitoring of T3 Possessions is being undertaken);**
- **Revise the current process of monitoring possessions through Safety Tours, CCE-SMS-008, to ensure the requirements of all guidelines are recorded in the Safety Tour Form[20];**
- **Once the Safety Tours, CCE-SMS-008, documentation has been reviewed and updated, verify that the Safety Tours are being carried out correctly, and in full accordance with the guidelines, through an auditing process.**

[20] Although noted that there have been improvements to the Safety Tour Form (paragraph 234), the RAIU consider there the Safety Tour Form should be further enhanced to include, at a minimum, all the requirements set out in the Guidelines.

Safety recommendation in relation to authority gradient

246 An element of authority gradient has developed whereby there is an established authority hierarchy of IÉ-IM supervisors over IÉ-IM GOs and contracted staff, this is clearly visible through the work crew accessing the site on the "word" of the ES and continuing work after the accident on the request of the PIC, despite requesting not to (paragraphs 213 - 215). As a result, the RAIU make the following safety recommendation to address causal factor, CaF-02 (paragraph 226):

Safety Recommendation 2023002-03

IÉ-IM should promote a positive culture between staff, at different grades, to ensure ground level staff (including contractors) feel confident to challenge more senior staff in terms of safety. This can be achieved through staff briefing days, safety campaigns and development of a means for staff to provide feedback on supervision activities.

Safety Recommendations as a result of additional observations

Submission of evidence to the RAIU

247 The RAIU found that IÉ-IM were slow to respond to RFIs submitted to the RAIU, and in some cases the wrong information was submitted, which extended the RAIU investigation over the twelve-month recommended publication date, as a result the RAIU make the following safety recommendation to address AO-01:

Safety Recommendation 2023002-04

IÉ-IM should introduce processes to ensure that information submitted to the RAIU is correct and submitted within the requested timeframes.

Competency management

248 In terms of competency of staff, it appears that CCE-SMS-001 is too broad, in that all management staff are responsible for all competencies; despite this, none of the staff present on the night of the accident, carrying out the rail replacement work, had the required competency as set out in CCE-TMS-422, even though an audit had been carried out compelling the CCE Department to actively train staff in the required competencies. It is noted that CCE-TMS-422 has been updated, however, at this stage that competency of staff has not been verified by the RAIU. As a result, the RAIU make the following safety recommendation to address AO-02:

Safety Recommendation 2023002-05

The IÉ CCE Department (Engineering Department Division 3) should ensure the requirements of CCE-TMS-422 (2022) are met in full.

Reporting of accidents

249 The accident was not reported, in full, in the first instance, as set out in CCE-SMS-005 and CCE-SMS-007; and the full scale only came to light due to the efforts of the internal IÉ Safety Department. The contractors and IÉ-IM GO felt unable to challenge the IÉ-IM supervisors, a form, of authority gradient). The RAIU make the following safety recommendation to address AO-03:

Safety Recommendation 2023002-06

IÉ-IM should conduct a full review on the reporting of accidents by IÉ-IM staff and contractors, consideration should be given to:

- **Reviewing CCE-SMS-007 and CCE-SMS-005 to identify any areas where improvements can be made related to the reporting of safety related occurrences; where areas of concern are identified these should be addressed;**
- **Enhance and promote its confidential reporting system to ensure all staff (with a particular emphasis on contracted staff) can report issues related to safety and welfare;**
- **Promote a positive culture, associated with the reporting of occurrences, in an effort to eliminate on-site authority gradients whereby staff cannot challenge supervisors (Safety Recommendation 2023002-03).**

250 The location of 9 m rail to be replaced was moved to allow for the damaged section of rail to be replaced; and not recorded in the "Shift Report" completed by the PIC, then acting as ES; and, it is not clear when STSEs would have noticed despite being directly accountable for the quality of work that affects track safety as set out in CCE-SMS-001 and CCE-SMS-008. CCE-SMS-008 does not appear to have stringent checks in relation to the quality of works carried out; with its main focus being on the contractors' method statements. The RAIU consider this warrants a safety recommendation to address additional observation, AO-05:

Safety Recommendation 2023002-07

The CCE Department review and update CCE-SMS-001 and CCE-SMS-008 with a view to addressing the monitoring and supervision of works, in terms of quality of works that affects track safety, which are carried out under internal method statements (and contractor) method statements.

Additional Information

List of abbreviations

CCE	Chief Civil Engineer
CRR	Commission for Railway Regulation
CTC	Centralised Traffic Control
CWR	Continuous Welded Rail
DMU	Diesel Multiple Unit
DVT	Driving Van Trailer
ES	Engineering Supervisor
GO	General Operative
hr	hour
IÉ-IM	Iarnród Éireann Infrastructure Manager
IÉ-RU	Iarnród Éireann Railway Undertaking
km	Kilometre
m	metre
MP	Milepost
mph	Miles per hour
OS	Occupational Safety
P&MS	Plant & Machinery Safety
PIC	Person in Charge
PICOP	Person in Charge of Possession
PWI	Permanent Way Inspector
RAIU	Railway Accident Investigation Unit
RRV	Road Rail Vehicle
RRVO	Road Rail Vehicle Operative
SET	Signalling, Electrical and Telecommunications
SRWE	Safety Review Workshop Executive
STSE	Senior Track & Structures Engineer
TCB	Track Circuit Block
TSC	Track Safety Co-ordinator
TS&SS	Track Safety & Structures Safety

Glossary of terms

Accident	An unwanted or unintended sudden event or a specific chain of such events which have harmful consequences including collisions, derailments, level crossing accidents, accidents to persons caused by rolling stock in motion, fires and others.
Action Required	In terms of the CRR, it's an area where potential exists for a non-compliance to occur unless remedial action is taken, or improvement is made, an isolated error that requires correction, or some other action arising from the audit.
Authority Gradient	Refers to the established, and/or perceived, command and decision-making power hierarchy in a team, crew or group situation, and also how balanced the distribution of this power is experienced within the team, crew or group.
Ballast	Crushed stones, nominally 48 mm in size and of a prescribed angularity, which serves as a bed for railroad tracks and provides track stability, drainage, and support of significant loads carried by railcars.
Causal factor	Any action, omission, event or condition, or a combination thereof that if corrected, eliminated, or avoided would have prevented the occurrence, in all likelihood.
Cess	The part of the track bed outside the ballast shoulder.
Continuous Welder Rail	Rails which are welded together to form one continuous rail that may be several kilometres long. Because there are few joints, this form of track is very strong, gives a smooth ride, and needs less maintenance.
Contributory Factor	Any action, omission, event or condition that affects an occurrence by increasing its likelihood, accelerating the effect in time or increasing the severity of the consequences, but the elimination of which would not have prevented the occurrence.
Down Direction	Travelling towards Cork.
Down Line	Line where trains are travelling towards Cork.
Fishplate	A metal connecting plate used to bolt the ends of two rails into a continuous track.

Incident	Any incident, other than an accident or serious accident, associated with the operation of trains and affecting the safety of operation.
Investigation	A process conducted for the purpose of accident and incident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations
Method Statement	A document that detail exactly how to carry out work safely; they describe the safety precautions to control risks identified in the risk assessment and detail the personal protective equipment, health and safety contacts and the control equipment required to keep workers and site visitors safe whilst tasks are ongoing.
Milepost	Marks distances.
Minor Non-compliance	Identified by the CRR as an area of non-compliance with a railway organisation internal standard, an applicable external standard, or legislation that is evidence of a sporadic lapse in implementation of a system or deviation from a system.
Occupational Safety	The workplace Safety of employees in a CCE Location; includes working in offices, in workshops, on the line, in road vehicles, at sites, etc.
Permanent Way Inspector	Responsible for programming and completing Permanent Way Maintenance and CCE renewal as required by standard in the area assigned.
Person in Charge of Possession	The Engineering Department concerned must appoint a PICOP, this person must be certified, familiar with the line and location of works, fully aware of T3 Possession arrangements and appointed primarily for this purpose of being in charge of possession and not have other duties unless agreed at the planning stage (Subsection 8.1). The PICOP is responsible for ensuring the necessary protection is provided for the T3 Possession and that it is given up properly; and while active, authorise movements entering or within the possession to ensure their safety (Subsection 9.1). Prior to taking a T3 Possession, the PICOP must check the details of the possession to be taken, including an agreed start time with the Signalman (Subsection 9.3). When taking the T3 Possession, the PICOP must check that signal protection is provided, arrange

	detonator protection and countersign the Train Register (where the Signalman enters the details of the possession arrangements), (Subsection 9.4). There are a number of instructions for the PICOP during the T3 Possession, in terms of this investigation which includes that the PICOP: Must not permit such work to start before the possession is granted; and complete Part A of the ES's Certificate (or instruct the ES to complete) when authorising the ES to start work, and give this to the ES; and, Part B of the Possession Arrangements Form to record when each ES is authorised to start work (Subsection 9.5.4).
Plant & Machinery	According to CCE-SMS-001, plant and machinery is all mechanical equipment that, in its operation, may pose either Occupational Safety Risks or Safety Risks to the IÉ asset base, for example cranes, dumper trucks, excavators, hedge cutters, hoists, all forms of road-rail vehicles and all hand-held power tools (e.g. rail saws, power spanners, "cobras", etc).
Plant & Machinery Safety	According to CCE-SMS-001, plant and machinery safety is the operation of all Plant & Machinery in a manner that is safe with regard to Occupational Safety and the Safety of that Plant & Machinery
Position of safety	A place allowing a clearance of at least 1.5 m (5 feet) between you (including anything you are wearing or carrying) and the nearest rail of any line on which a train is approaching.
Rail stressing	It is used to prevent heat and cold tension after installation of continuous welded rail. Environmental heat causes CWR to expand and therefore can cause the fixed track to buckle. Environmental cold can lead to the contraction of the fixed railway track causing brittleness and cracks. Before it is installed, the rail is altered by stretching with hydraulic rail tensors or heated to its stress-free temperature to make these dangerous problems less likely.
Rail Tensor	A piece of equipment used by railway maintenance engineers for carrying out rail stressing, welding, failure repairs, and servicing. They work by clamping around the rail track and use hydraulic cylinders to pull rail sections closer together. Also known as rail stressor or rail puller.
Systemic factor	Any causal or contributing factor of an organisational, managerial, societal or regulatory nature that is likely to affect similar and related

	occurrences in the future, including, in particular the regulatory framework conditions, the design and application of the safety management system, skills of the staff, procedures and maintenance.
T3 Possession	A possession taken for an agreed period without the facility to run passenger trains in the area during that period until such time as the holder of the possession decides to relinquish it
Track Safety	According to CCE-SMS-001, track safety is the operation of the Track and all Track-related sub-systems in a manner that is safe with regard to passenger Safety.
Track Safety Co-ordinator	IÉ Rule Book, Section B, Part Two, Subsection 6.0 Instructions to Track Safety Co-ordinators, clearly defines the roles and responsibilities of the TSC.
Up Direction	Towards Dublin.
Up Line	Line where trains are travelling towards Dublin.

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