

ONRSR Guideline

Investigation Reports by Rail Transport Operators



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1 Purpose

The purpose of this guideline is to outline ONRSR's expectations of investigation reports prepared by, or for, Australian rail transport operators into a rail occurrence.

Rail transport operators' investigation reports provide an opportunity to better understand how an incident occurred, so that lessons can be learned, and to make recommendations which, if acted upon, can prevent a recurrence.

This guideline is aimed at rail safety managers and rail investigators. It may also assist line managers.

This guideline comprises two parts:

- > investigation context
- > guidance on internal investigation reports.

2 Background

Australian rail transport operators investigate a wide spectrum of rail occurrences that occur within their operations.

Rail transport operators are responsible for determining when to conduct an investigation, preparing an investigation report and making findings, identifying corrective actions, following up on the implementation of these recommendations and assessing the effectiveness of these changes. See 5.1 of this guidance for an outline of the regulatory requirements for conducting an investigation.

Rail transport operators commonly undertake investigations in-house (such as, a member of the investigation team or a member of an operational division could be appointed as the investigator) or a third party consultant may be contracted. Where there is a need for an investigation to seek specialist input (such as, a human factors expert or a metallurgist), an operator may have these resources in-house or an external contractor may be sought.

There are many models that can be used to describe the investigation process and ONRSR accepts that a rail transport operator will adopt terminology and processes that are appropriate to its own operations.

The RISSB *Rail Safety Investigation* code of practice provides investigators with guidelines and standards for preparing effective investigation reports. The code acknowledges that a report format is a matter for the rail transport operator in line with the requirements of the organisation's safety management system.

ONRSR can direct a rail transport operator to undertake an investigation with the terms of reference for the investigation specified in a s122 Notice to Conduct an Investigation. The *Rail Safety National Law* requires that an operator conduct and report on its investigation within the timeframes specified and in the manner approved by the Regulator. The focus of the s122 Notice is to determine the cause and contributing factors of the incident rather than to apportion blame. This guideline is intended to provide further clarification of ONRSR's expectations and to assist operators to meet the legislative requirements

2.1 Supporting material

The ONRSR guideline is intended to complement and should be read in conjunction with the RISSB *Rail Safety Investigation* code of practice which defines good practice for the Australian rail industry in the investigation of rail safety occurrences and aligns with the requirements of

Australian Standard 4292 part 7: *Railway Safety Investigation* (AS 4292.7). The code of practice provides a standard investigation process, guidance on organising and analysing data and developing an investigation report and a suite of tools to assist investigators.

3 Scope

The scope of this guidance is to improve safety learnings from investigation reports so that subsequent controls for rail safety risks described in the rail transport operator's safety management system are effective.

This guideline has been produced as part of ONRSR's safety improvement and education program to assist rail transport operators achieve greater consistency in the standard of investigation reports. The guidance provides transparency around ONRSR's expectations and what makes an acceptable report. It does not supersede obligations for operator investigations to satisfy the requirements of the Rail Safety National Law.

The process outlined in this guideline will also support interactions with ONRSR when an investigation report is requested. Those responsible for initiating investigations for, or on behalf of, a rail transport operator are encouraged to consider ONRSR's expectations as outlined in this guideline.

Scenario: A scenario based on a train incursion into a worksite will be used in this guideline to reinforce the key principles in this document. The scenario will appear in text boxes.

4 Definitions

Definitions provided by the *Rail Safety National Law* (RSNL) and the National Regulations apply within this guideline.

- > **RSNL** – means the *Rail Safety National Law* which has been enacted as a Schedule to the *Rail Safety National Law (South Australia) Act 2012 (SA)* as it applies in each state and territory. In Western Australia, RSNL means the law which has been enacted as mirror legislation in the *Rail Safety National Law (WA) Act 2015*.
- > **National Regulations** – means the Rail Safety National Law National Regulations 2012; or the Rail Safety National Law (WA) Regulations 2015 in Western Australia.

Where terms are not defined within the legislation the *Macquarie Dictionary* definition applies.

Use of the word 'should' indicates a recommendation of ONRSR, however, the rail transport operator is free to follow a different course of action provided that it complies with the legislation. Use of the word 'must' indicates a legal requirement where compliance is necessary.

5 Legislative framework

5.1 Regulatory requirements

Under the RSNL, ONRSR can require a rail transport operator to provide its own investigation reports to the Regulator, in accordance with;

- > section 20 – Power of Regulator to obtain information, and
- > section 168A – Power to direct production of documents (note this provision does not apply in Western Australia).
- > section 122 of the RSNL, where ONRSR can direct a rail transport operator to undertake an investigation of a rail incident.

- > Regulation 23 of the RSNL National Regulations includes provisions in relation to the investigation of notifiable occurrences.
- > the RSNL National Regulations, where an effective safety management system is to be reviewed regularly with consideration given to recommendations from investigation reports (see regulation 17 – Review of safety management system).

A just culture approach to investigations, with appropriate corrective action identified, should lead to a positive safety culture. Schedule 1 of the National Regulations includes the following specific provisions: '3 – Safety culture' and '11 – Corrective action'.

The legislation and the regulations are available at <http://www.onrsr.com.au/operations/legislation>.

6 Investigations overview

It is expected that a rail transport operator's investigation report is based on an investigation process which follows industry good practice and investigation principles including:

- > just culture
- > systems investigation
- > independence and authority of investigators
- > scalability of investigation capability and competence of investigators
- > human factors integration.

6.1 Just culture

A 'just culture' approach enables an organisation to find out why an incident occurred and why an individual or organisation took, or failed to take, certain actions.

ONRSR acknowledges the industry approach to just culture investigations as set out in the RISSB *Rail Safety Investigation* code of practice, where a just culture approach to investigations and the adoption of a just culture philosophy is advocated as a core principle. The Australian Standard 4292.7 also encourages investigations which support a just culture approach.

Just culture relies on a positive reporting culture where uncensored reporting of incidents is encouraged and investigations seek to identify the conditions that led to the incident not just apportion blame. A just culture promotes an environment where the people involved in a rail safety incident feel confident to talk with the organisation's investigators.

In a just culture environment, the potential for human error is acknowledged and systems and practices that promote learning from past errors or mistakes are necessary.

As a minimum, ONRSR expects:

- > the principles of just culture are applied to the investigation of incidents and are evident in the investigation report and the development and implementation of corrective actions.

6.2 Systems investigations

The role of an investigation is to identify what has occurred, how it occurred and why, in order to make systems more effective. For example, if a rail safety worker failed to comply with a procedure, the investigation may find the procedure is always circumvented by personnel as it is impractical or it is written in such a way it can be misinterpreted. If this is the case the procedure may need to be rewritten rather than just disciplining or retraining the rail safety worker.

A systems approach to investigations and the adoption of a structured, systematic and iterative process for gathering and analysing data are core principles of the *Rail Safety Investigation* code

of practice. Furthermore, Australian Standard 4292.7 has as its primary objective “the enhancement of safety through the discovery of any systemic problems and deficiencies which may have led to the occurrence, or any latent safety issues the investigation might reveal”.

As a minimum, ONRSR expects:

- > analysis of the facts to determine what happened and why the incident occurred. If the ‘why’ can be established then effective recommendations can be made and action taken to prevent a recurrence.

6.3 Independence and authority of investigators

An investigator requires both the authority, and the access, to talk to a range of people across the organisation. Management support is necessary to prevent an investigation being hindered.

In addition, independence from the branches of the organisation involved in the incident is required. The degree of independence should be proportionate to the significance of the incident. For example, an external party may be contracted to undertake an investigation into a serious incident as this could entail looking at numerous departments and organisations.

An investigator should not have been directly involved in the incident or have a conflict of interest (such as, be the supervisor or line manager; or the person who designed the procedure or process involved in the incident; or the person responsible for implementing the procedure or process).

Management commitment to a fair and independent investigation is a core principle of the RISSB *Rail Safety Investigation* code of practice. The Australian Standard 4292 provides for four levels of investigations and the independence required of investigators for each level – see Table A1 in the standard.

As a minimum, ONRSR expects:

- > an investigator has the commitment and support of senior management to work across all departments in the organisation
- > an investigator enters an investigation with no preconceptions or biases.

6.4 Investigation capability and competence of investigators

The capacity and capability to undertake rail occurrence investigations in-house will vary depending on the size of the operator. Large rail transport operators may have a separate safety department with multiple personnel who are trained as investigators. Small operators may not have dedicated investigators, rather a number of people who are trained as investigators to undertake this role if needed.

In some instances, a contracted investigator may be employed by a rail transport operator to undertake the investigation and, if so, the operator should have a process to determine whether the investigator has the requisite competency and capacity.

As a minimum, ONRSR expects:

- > Investigators have participated in an appropriate investigations training program/s.

6.5 Human factors integration

Human error (also referred to as performance variability) is commonplace in rail safety occurrences. The Australian Standard 4292.1 recognises this and places emphasis on the design of systems to prevent incidents: “Organisations shall demonstrate that they understand that human error is normal and that systems need to be designed to complement the human operator in the design and function of all aspects of the organization and its operations that have an interface with

the human user. These aspects include the human–machine interface, organisational design, culture, business processes and team processes”.

The majority of human errors are consequences of a mismatch between the demands of the systems and assets, and the capability of the people trained to use those systems and assets. The potential for error or injury due to this incompatibility should be examined in an investigation.

For example, investigation reports may contain the recommendation that a rail safety worker be retrained. The investigation reveals that the rail safety worker knows the rules and it is likely that retraining will not correct the problem as the recommendation does not address why the person strayed from the rules. If one person is making an error, it would be expected that the investigation would look to see if other personnel are making the same error, or are likely to, and what actions can be undertaken to address this form of error. The investigation would also be expected to examine the procedures and whether these are difficult to follow and review the usability of the systems or equipment that the procedures relate to and whether these are suitable for the task.

As a minimum, ONRSR expects:

- > the investigator to consider the interaction between people and equipment/procedures during the investigation
- > expert human factors input, particularly for cases where human error is apparent, is sought if required.

7 Guidance on internal investigation reports

It is expected that a rail transport operator’s investigation report addresses these fundamental areas:

- > facts
- > analysis
- > findings
- > recommendations
- > review.

7.1 Facts

- The facts gathered during an investigation into an incident are a core component of the resulting investigation report. The investigation report needs to identify the facts relating to the incident and effectively collate details of the facts of the occurrence and the relevant elements of the operator’s safety management system in order to explain and understand what happened. ONRSR expects that an investigation report provides an adequate description of the incident, details of the facts that were found, identifies the risks, controls and system failures; and any immediate safety actions that were taken post incident to prevent a recurrence.

7.1.1 Description of the incident

The investigation report should contain sufficient details about an incident that provides the reader with a clear understanding of the circumstances leading up to the incident.

As a minimum, ONRSR expects:

- > description of the incident including the date of the incident, the time it occurred, the location of the incident
- > details about the people and rolling stock/equipment involved

- > the results of the incident (in particular, any fatalities or injuries to personnel and damage to equipment and infrastructure).

Scenario – description of the incident:

At 10pm on 1 July 2016, at location ABC, train XYZ came to a stop upon seeing workers on track. There was a protection officer and three workers from the rail infrastructure manager, TTT, on track at the time of the incident and the train driver was from the passenger train operator BBB. There were no injuries to workers and no damage to equipment. The worksite protection was established on a single track.

7.1.2 Fact-finding

Comprehensive factual information gathered during an investigation informs the subsequent findings and recommendations of an investigation report and provides the basis upon which immediate or long-term safety actions are taken. A good investigation report relies on the inclusion of relevant information from various sources and sufficient details about the incident to provide a comprehensive picture of what occurred.

As a minimum, ONRSR expects:

- > factual information from a range of sources
- > a sequence of events constructed from the factual information
- > sufficient detail about the people involved
- > sufficient detail about the incident
- > sufficient detail about the equipment involved.

Scenario – fact finding:

Information was gathered from interviews with the protection officer, track workers, network controller and train driver. Other sources of information may include photos, witness statements and documents such as risk registers and procedures. If relevant, data-loggers and in-cab forward facing CCTV or station CCTV, training records and voice logs (of communication between the protection officer and network controller) and data from train control systems could also be obtained.

Relevant details about the people involved should include years of experience in the rail industry, years in their role, competency of the personnel involved, experience operating a piece of equipment, knowledge of the location where the incident occurred, staffing configuration on the day of the incident.

7.1.3 Review of safety management system and risk register

An effective investigation report identifies the risks and the controls. The report may outline whether the risks associated with the incident being investigated were recorded in the operator's risk register and, if not, why this particular type of incident was not accounted for within the risk register. The report may also outline which controls were in place to prevent the occurrence, whether the controls were implemented and complied with (and if not, why not), whether the controls were effective (and if not, why not), and whether the controls were detailed in the safety management system.

As a minimum, ONRSR expects:

- > consideration whether the risk/s associated with the incident were identified in the rail transport operator's risk register and the effectiveness of applicable controls

- > consideration of whether changes are required to the risks and/or controls in the risk register as a result of the incident
- > consideration of other possible outcomes of the incident.

Scenario – review of safety management system and risk register:

The worksite was established on a bend but this risk was not identified in the risk assessment conducted at the site. The risk of working on track with limited line of sight was not included in the organisation’s risk register and because of this there were system failures in identifying training and procedural controls.

What were the applicable rules and procedures for protecting the workers on track? Did the people involved do what they were supposed to do, and is what they are supposed to do appropriate? Did the site risk assessment rely on a control that was not in place or why was the bend at the incident site not identified as a risk?

7.1.4 Immediate safety actions

In many cases, the initial findings from the incident result in the imposition of immediate or interim safety actions put in place to prevent a recurrence of the incident. Immediate or interim safety actions should provide a level of assurance to the organisation that it is managing the risks associated with the incident, and these actions should be added to the investigation report.

As a minimum, ONRSR expects:

- > an outline of the immediate safety actions taken (if any) and by whom, the status of these actions and the outcome of the review of relevant safety management system controls.

Scenario – immediate safety actions:

The worksite was set up outside a tunnel on a bend where visibility was difficult. The initial findings indicate the worksite should have required a higher level of protection due to the visibility issues. A directive is issued by the rail transport operator to use a higher level of protection at high-risk locations such as near tunnels and on bends.

7.2 Analysis

The analysis attempts to make sense of the factual information that has been gathered during the investigation. An analysis is required to determine why the incident occurred, how it could have been prevented. It should identify if and if so, why a person did not comply with established procedures and whether the safety management system and risk register had identified the particular risk.

The analysis should, where applicable, review the effectiveness of the established risk control measures. and what if any actions are required to be taken. Analysis can also determine whether an incident was a one-off or part of a broader safety concern.

An effective analysis can provide valuable insight into the requirement for safety improvements that will prevent a recurrence.

7.2.1 System failures

An effective investigation should identify if there are any weaknesses in a system, rather than only looking at an individual or technical failure.

An investigation report provides an opportunity to consider the adequacy of processes and procedures and possible reasons for non-compliance rather than only attributing blame to those involved. This is the purpose and benefit of a just culture investigation.

As a minimum, ONRSR expects:

- > examination of the appropriateness of the safety actions chosen for the location (including foreseeable weather conditions) and the work being conducted
- > examination of the competency of workers to perform tasks
- > examination of human factors and the integration of human factors in the safety management system
- > previous history of similar occurrences and any investigations conducted and corrective actions taken
- > examination of maintenance regimes (if relevant)
- > examination of compliance with standards and operating requirements (if relevant)
- > examination of change management processes (if relevant)
- > a systematic critique of the operator's processes including whether the controls in place were appropriate and verification that a process for monitoring the effectiveness of those controls has been established.

Scenario – system failures:

There was a reliance on procedural controls which are prone to human error. What was the procedure for the method of working, was the procedure followed, were the correct warning devices used (e.g. hand signallers, flags, detonators, lights), and were communication protocols followed? If relevant, what selection processes, safety behaviour assessments, risk training is provided that assures the operator of a worker's competence?

7.2.2 Reviewing the information

Information gathered during the investigation should be critically examined to determine if the information is relevant to the facts of the incident. At this stage of the process, some information may need to be included to provide context and some may be excluded with the reasons for doing so explained. This review provides the background of how the incident occurred.

As a minimum, ONRSR expects:

- > a critical review is undertaken of information gathered in the investigation report.

Scenario – reviewing the information:

There were conflicting statements from those interviewed as part of the investigation. The track workers state that when the train entered the worksite they were all clear of the track. The train driver, however, states that the workers were on track. As there is no in-cab video that can be obtained to verify the train driver's statement, alternative records (e.g. data loggers or voice recordings) may help to substantiate information obtained from individuals.

7.3 Findings

Based on the investigation and the analysis it is now possible to draw conclusions and make findings. No new information should be introduced at this stage. Findings are essentially the lessons learned from the analysis of the investigation.

7.3.1 Direct causes

The direct causes of an occurrence are findings which should be included in an investigation report.

As a minimum, ONRSR expects:

- > findings of the direct causes that led to the incident are based on factual information gathered and the analysis undertaken during the investigation.

Scenario – direct causes:

The investigation concluded that the incident occurred due to the following:

1. A communication breakdown between a protection officer and a network controller where critical information was not confirmed or clarified.
2. The network controller believed the protection officer was at a worksite at location DEF when the protection officer was actually at location ABC. As a result, protection was put in place at the wrong location and the actual worksite was left unprotected.

7.3.2 Contributing factors

The contributing factors are those elements which are partially or directly responsible for the incident. These contributing factors should be included in an investigation report. In essence contributing factors explain what caused or influenced the incident.

As a minimum, ONRSR expects:

- > findings about the factors that contributed to the incident are based on the analysis of factual information gathered during the investigation.

Scenario – contributing factors:

The investigation found that the following factors contributed to the incident:

1. The protection officer and the network controller, due to a miscommunication, failed to confirm the actual location of the worksite.
2. The protection officer was phoning from an area of poor mobile phone reception and as a result he could not be clearly heard by the network controller.
3. There was a failure to identify the risk of establishing a worksite outside a tunnel and on a bend.
4. There were deficiencies in the risk register as a higher level of protection was required for the worksite which, due to its location, had visibility issues.
5. Inadequate training in safety critical communications had been provided to either the protection officer or the network controller.
6. The network controller had been working for a 14-hour period on an overtime shift due to staff illness. The incident occurred in the last 30 minutes of this shift.
7. Prior to working this 14-hour shift, the network controller had only had an eight-hour break. This is a breach of the organisation's fatigue policy which states that there must be a minimum of 10 hours between each shift.

As a result:

1. Protection was implemented by the network controller at a different location.
2. The actual worksite was unprotected for the duration of the work.
3. The train entered the worksite due to no protection being implemented and no signals placed at stop to alert the train driver.

7.4 Recommendations

An investigation is undertaken to prevent a recurrence. An effective investigation – one that identifies why the incident occurred and the various contributing factors that led to the incident – provides the foundation for effective findings which subsequently informs the recommendations for corrective actions. The purpose of reporting on an investigation is to act upon the safety learnings.

7.4.1 Making recommendations

An investigation report's recommendations should focus on actions to mitigate or eliminate the safety deficiencies identified. The recommendations should include corrective actions which link to the safety management system. General statements such as 'consider undertaking a review' are not considered a satisfactory safety action.

Development of non-prescriptive recommendations is a core principle of the RISSB *Rail Safety Investigation* code of practice.

As a minimum, ONRSR expects:

- > recommendations are drawn from the findings
- > specific safety actions are identified.

Scenario – making recommendations:

The investigation report recommends:

1. All protection officers should be briefed that if they are in an area of poor mobile reception they are to move to a location where clear reception can be accessed.
2. All network controllers should be briefed on the importance of confirming critical safety communications and not to act on any communication unless it has been confirmed.
3. Adequate training in communications is to be provided to all protection officers and network controllers.
4. Ongoing sampling, auditing and/or monitoring of procedural controls are conducted to determine their effectiveness as a control measure.
5. Rostering procedures for network control staff on overtime are to be reviewed to ensure compliance with fatigue policy.

7.4.2 Setting timeframes for corrective actions

The timely implementation of recommendations and safety actions is essential to prevent the recurrence of incidents. Timeframes should be realistic and achievable.

As a minimum, ONRSR expects:

- > Specific timeframes to support the recommendations should be included in the investigation report.

Scenario – setting timeframes for corrective actions:

The investigation report recommends:

1. A toolbox talk is to be developed within two weeks of the report being approved with talks to be delivered within the month.
2. Rostering procedures are to be reviewed within four weeks.
3. A training course is to be developed, and delivery is to be completed, within identified timeframes.

7.4.3 Stakeholder feedback

Before an investigation report is finalised, it should be shared with relevant stakeholders to validate the facts and seek the stakeholder's views on the recommendations.

As a minimum, ONRSR expects:

- > There is a provision in the operator's process for the review of stakeholder feedback on an investigation report.

Scenario – stakeholder feedback:

The report has been reviewed by stakeholders and relevant feedback is reflected in the report.

7.4.4 Integration and next steps

There are a series of activities which occur once an investigation report is completed and the recommendations accepted. These activities include the tracking, implementation and completion of corrective actions.

The corrective actions arising from the recommendations from investigation reports should be integrated into the safety management system. As outlined in the ONRSR fact sheet [Requirement for RTOs to Report Notifiable Occurrences](#), attention should be given after any incident to making improvements to the safety of the RTO's operations, as part of business practices. In addition, a commitment to learning from failures is a core principle of the RISSB *Rail Safety Investigation* code of practice.

As a minimum, ONRSR expects:

- > recommendations are tracked with reasons provided for whether the recommendation was accepted and, if not, why it was rejected
- > a timeframe for the action is recorded. The timeframe will depend upon the complexity of the actions arising from the recommendation and the need for any expenditure
- > ongoing monitoring of the status of recommendations from previous internal investigation reports so that improvements can be made to prevent a recurrence.

Scenario – integration and next steps:

The recommendation to review rostering procedures was rejected as a new rostering system, which was under development at the time of the incident, has been put in place. This decision is documented against the investigation report.

7.5 Review

Following completion of an investigation report, a report may be reviewed and feedback provided to the investigator. The review may be a peer review, a management review, or a review by the departments/individuals involved in the incident.

Once an investigation report has been approved and the recommendations implemented, it is important to schedule and conduct a post-implementation review. The operator's assurance process should be an integral part of the review process that confirms whether the corrective actions are effectively managing those risks identified as contributing to the incident.

The review of corrective actions arising from the recommendations should also be considered as part of an ongoing continuous improvement process.

As a minimum, ONRSR expects:

- > an audit, or other verification activity, is scheduled to confirm that the accepted corrective actions have been actioned and are effective in addressing the safety findings of the investigation. This should be part of a rail transport operator's assurance process that provides evidence giving a level of confidence the corrective actions will eliminate or mitigate the risks associated with the incident.
- > verification of action taken is recorded before recommendations are closed
- > review of corrective actions.

Scenario – review:

The rail transport operator not only has a process for managing and reviewing the actions arising from the recommendations from investigation reports but has an assurance process that provides a level of confidence the actions are being applied effectively.