



Transport
Asset Standards
Authority

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Standard

Risk Assurance for Distributed Power Freight Trains

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Standard governance

Owner: Lead Rolling Stock Engineer, Asset Standards Authority
Authoriser: Chief Engineer, Asset Standards Authority
Approver: Executive Director, Asset Standards Authority on behalf of the ASA Configuration Control Board

Document history

Version	Summary of changes
1.0	First issue

Preface

The Asset Standards Authority (ASA) is a key strategic branch of Transport for NSW (TfNSW). As the network design and standards authority for NSW Transport Assets, as specified in the *ASA Charter*, the ASA identifies, selects, develops, publishes, maintains and controls a suite of requirements documents on behalf of TfNSW, the asset owner.

The ASA deploys TfNSW requirements for asset and safety assurance by creating and managing TfNSW's governance models, documents and processes. To achieve this, the ASA focuses on four primary tasks:

- publishing and managing TfNSW's process and requirements documents including TfNSW plans, standards, manuals and guides
- deploying TfNSW's Authorised Engineering Organisation (AEO) framework
- continuously improving TfNSW's Asset Management Framework
- collaborating with the Transport cluster and industry through open engagement

The AEO framework authorises engineering organisations to supply and provide asset related products and services to TfNSW. It works to assure the safety, quality and fitness for purpose of those products and services over the asset's whole-of-life. AEOs are expected to demonstrate how they have applied the requirements of ASA documents, including TfNSW plans, standards and guides, when delivering assets and related services for TfNSW.

Compliance with ASA requirements by itself is not sufficient to ensure satisfactory outcomes for NSW Transport Assets. The ASA expects that professional judgement be used by competent personnel when using ASA requirements to produce those outcomes.

About this document

The standard sets out a structured risk assurance framework and process for rolling stock operators to follow when requesting approval for new or altered distributed power freight trains. This document covers the operation of distributed power freight trains operating on the TfNSW Metropolitan Heavy Rail Network

This standard is a first issue.

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1. Introduction

Distributed power (DP), in particular wired distributed power (WDP), technology is being used by more and more rail freight operators in their business and service planning. , DP enables an increase in train size without exceeding drawgear limits and permits bidirectional running without remarshalling of locomotives resulting in increased hauling tonnage and operational flexibility.

This standard supports the objectives and goals of the *NSW Freight and Ports Plan*, in particular the following:

- Objective 1: Economic growth - Providing confidence and certainty that encourages continued investment in the freight industry to support economic growth
- Objective 2: Efficiency, connectivity and access - Improving the efficiency of existing infrastructure and ensuring greater connectivity and access along key freight routes in the Metropolitan Heavy Rail Network
 - Goal 1: Support the use of technology to improve efficiency and productivity
 - Goal 5: Improve rail freight access and flows

Operation of WDP freight trains using electronically controlled pneumatic (ECP) technology in a high density, mixed traffic metropolitan rail environment is a new concept in NSW. There are differences in the operations model (for the rolling stock operator) and network management model (for the rail infrastructure manager and network control) when compared to operating head end power (HEP) freight trains.

Requests for WDP operations on the TfNSW Metropolitan Heavy Rail Network are assessed on a case by case basis.

2. Purpose

This standard specifies the risk assurance requirements for the operation of WDP freight trains on the TfNSW Metropolitan Heavy Rail Network. This standard provides a structured framework and process for rolling stock operators to follow when seeking approval for WDP operations from TfNSW to demonstrate proposed WDP freight train operations are safe and reliable so far as is reasonably practicable (SFAIRP).

This standard also provides a formal and consistent approach for stakeholders across the TfNSW cluster in assessing and approving future DP freight trains operating on the network.

2.1. Scope

This document sets out the framework and process which rolling stock operators need to follow when introducing WDP freight trains on the TfNSW Metropolitan Heavy Rail Network. Refer to

the TS TOC 1 *Train Operating Conditions (TOC) Manual – General Instructions* which defines the areas associated with the network.

This document does not cover the requirements of manned DP operations which are specified in TS TOC 1.

This standard does not cover the requirements for wireless (radio frequency connectivity) DP operations that are not currently permitted on the TfNSW Metropolitan Heavy Rail Network.

This document also specifies the configuration changes to WDP freight trains that are already approved to operate on the network.

2.2. Application

This document applies to rolling stock operators while seeking approval to operate WDP freight trains (new or modifications to an existing one) on the TfNSW Metropolitan Heavy Rail Network.

This standard applies to WDP freight trains operating on the TfNSW Metropolitan Heavy Rail Network. The standard does not apply to WDP passenger trains such the XPT.

3. Reference documents

The following documents are cited in the text. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document applies.

Transport for NSW standards

T MU MD 20002 ST Risk Criteria for Use by Organisations Providing Engineering Services

TS TOC 1 Train Operating Conditions (TOC) Manual – General Instructions

TS TOC 2 Train Operating Conditions (TOC) Manual – Division Pages

Other reference documents

NSW Government, September 2018, NSW Freight and Ports Plan 2018-2023

Rail Industry Safety and Standards Board, July 2014, Guideline - Derailment Investigation and Analysis Guideline

Rail Industry Safety and Standards Board, July 2018, Code of Practice - Distributed Power Freight Trains

4. Terms and definitions

The following terms and definitions apply in this document:

DP distributed power; refers to the practice of placing locomotives at several locations within a train as distinct from placing all locomotives at the front of the train (*Code of Practice - Distributed Power Freight Trains*)

ECP electronically controlled pneumatic

HEP head end power; a train operating with all motive power units located at the front of the train consist (*TS TOC 1*)

L/V (lateral to vertical force) ratio is the lateral force pushing outward against the rail divided by the vertical force pushing downward on the top of the rail. The L/V ratio gives an indication of the likelihood of derailment due to flange climb and also rail lateral displacement and rollover (*Guideline – Derailment Investigation and Analysis Guideline*)

MDP manned (or manual) distributed power; refers to a distributed power train using crew in more than one locomotive to control locomotives as directed by the driver in the lead locomotive, usually using radio communication (*Code of Practice - Distributed Power Freight Trains*)

RIM rail infrastructure manager

SFAIRP so far as is reasonably practicable

SPAD signal passed at danger

TfNSW Transport for NSW

TOC train operating conditions

WDP wired distributed power; used with ECP to provide control and monitoring of every vehicle (wagon and loco) in the train

5. WDP freight train operations approval

TfNSW has adopted a risk based approach in assessing WDP freight train operations on the TfNSW Metropolitan Heavy Rail Network. The risk and safety assurance framework for a rolling stock operator to obtain approval to operate WDP is in Section 5.1 to Section 5.3.

5.1. Operations and maintenance concepts

Clear operations and maintenance concepts for the proposed WDP freight train from rolling stock operators assist the asset owner, the rail infrastructure manager (RIM) and network control assess the risks associated with the proposed operation.

Note: For the TfNSW Metropolitan Heavy Rail Network, TfNSW is the asset owner and Sydney Trains is both rail infrastructure manager and network control

Identification of potential WDP operations planned for the rolling stock operator's business in the operations concept and maintenance concept reduces the amount of effort and time for both the rolling stock operator and other stakeholders involved in the assessment and approval process.

Refer to Section 6 for requirements associated with operations concept definition and maintenance concept definition.

5.2. WDP freight train risk management

The key risks associated with WDP freight trains operating on the TfNSW Metropolitan Heavy Rail Network are as follows:

- derailments (wheel climb, vehicle overturn and jack knife)
- runaway train
- train separation
- signal passed at danger (SPAD)
- train crew health impact or injury (include ability to recover a failed train)
- environmental pollution to the network
- train path not available
- train blocking network traffic
- disruption to other services on the network

Note: Some of these risks are also applicable for HEP freight trains.

In general the length of the proposed WDP freight train has a positive correlation to its risk level.

The main hazards that will expose the WDP freight train to the key risks are as follows:

- excessive in-train forces (the *Code of Practice - Distributed Power Freight Trains* provides details of in-train forces in WDP operations)
- inability to lift load
- degraded or loss of braking functionality
- locomotive exhaust emissions
- locomotive, wagon or train noise emissions
- unplanned stops of train in live traffic

Many hazards in planning and operations can result in risks when operating a WDP freight train on the TfNSW Metropolitan Heavy Rail Network. A list of events, developed based on the knowledge and experience from previous WDP approvals, categorised into concern groups is in Appendix A.

Figure 1 shows a diagrammatic presentation between the relation of risks, hazards, events and concerns in the context of WDP freight train risk management.

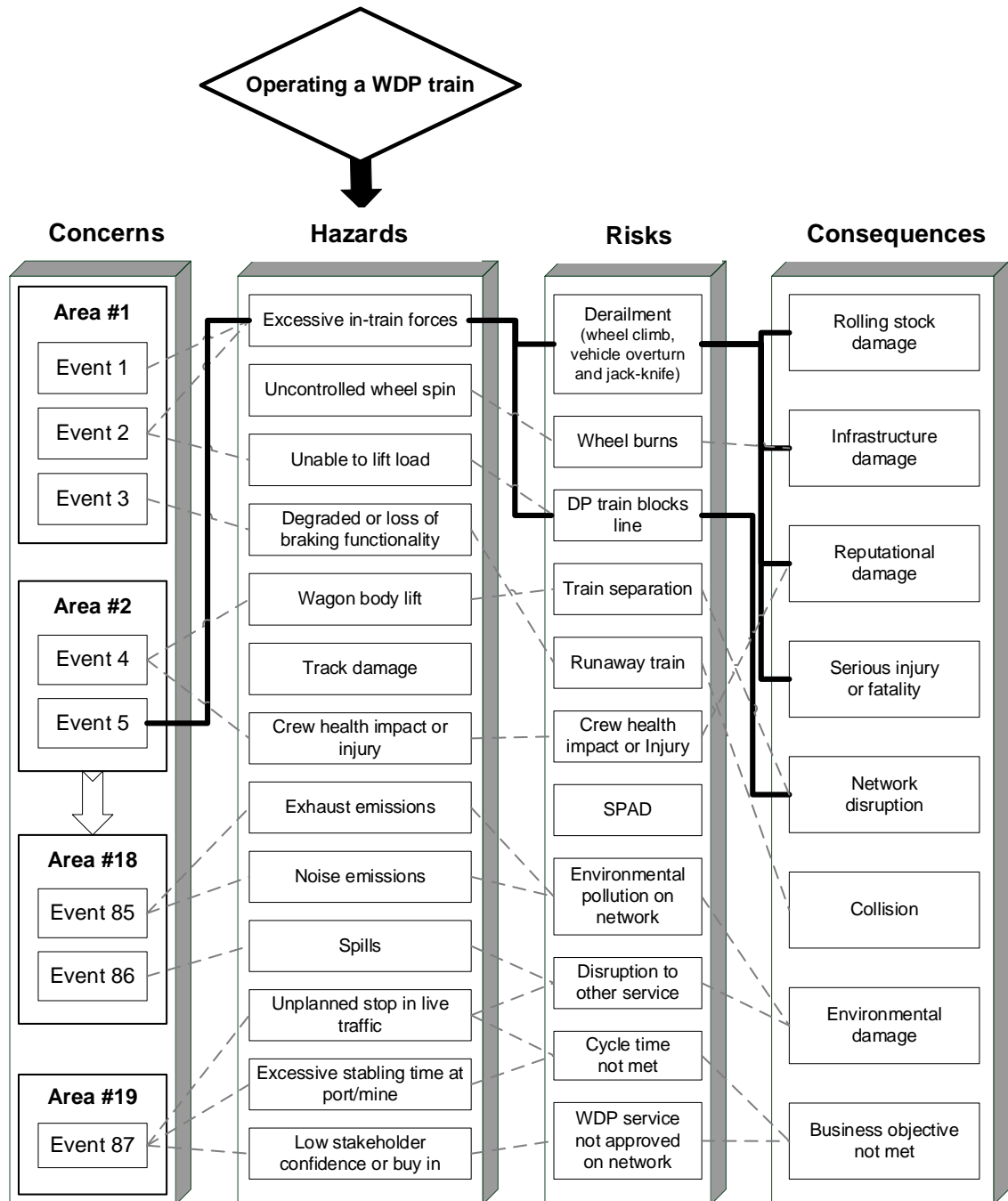


Figure 1 Hazards, risks and consequence inter relationships in WDP freight trains

See Section 6 for requirements associated with risk management.

5.2.1. Risk analysis

Risk analysis of proposed WDP freight trains enables identification of the risks, hazards and events that are specific to individual trains based on the operation concept and maintenance concept.

A risk analysis template, in the format of a prepopulated WDP train hazard log has been provided for rolling stock operators' use in Appendix A.

5.2.2. Risk and safety assurance report

The purpose of a risk and safety assurance report is to serve as the master document that documents the following:

- the operations concept and maintenance concept of the proposed WDP operations
- a summary of the risk analysis and discussion on the key risks identified
- actions taken by rolling stock operators to ensure the proposed WDP freight train is safe and reliable SFAIRP
- evidence to demonstrate safety and reliability SFAIRP (see Section 5.2.3)
- verification of risk assurance requirements
- evidence of appropriate consultation with stakeholders (see Section 5.3)
- the operating conditions applicable to the proposed WDP freight train
- assumptions and dependencies

A TfNSW endorsed risk and safety assurance report is the formal acceptance for operating the proposed WDP freight train on the TfNSW Metropolitan Heavy Rail Network.

5.2.3. Demonstrating SFAIRP through verifiable evidence

The demonstration of SFAIRP by the rolling stock operator to ensure the safety and reliability of proposed WDP freight train can be achieved by using a combination of the following:

- engineering analysis on in-train forces in the form of calculation, modelling and simulation (the *Code of Practice - Distributed Power Freight Trains* provides further guidance on in-train dynamic analysis)
- use of normalised reliability data from other WDP operations (for example door failures per year, number of failures per 1000 wagons and mean time between failure (MTBF) for the ECP or WDP system) with similar operations and maintenance concepts
- adoption of best practice from other documented WDP operations
- ECP and WDP setup and testing procedures developed and communicated to train crew
- ECP and WDP fault finding sheets developed and communicated to train crew
- specific train handling procedures developed (as a result of the risk or engineering analysis) and communicated to train crew
- en route defective locomotives or wagons management procedures developed (as a result of the risk or engineering analysis) and communicated to train crew

- train recovery plans developed (as a result of the risk or engineering analysis) and communicated to train crew and network controllers to form part of Sydney Trains incident management
- tunnel evacuation procedures developed (if applicable) and communicated to train crew
- train loading requirements developed (as a result of the risk or engineering analysis) and communicated to train crew and loading staff
- network testing (for example stopping distance test)

5.3. TfNSW engagement and approval

Adequate engagement and buy in from various functional areas within the TfNSW cluster will enable the transition and integration of WDP freight trains to form part of business as usual operations on the TfNSW Metropolitan Heavy Rail Network.

Table 1 provides the list of the primary stakeholders for each of the functional areas within the TfNSW cluster and their role in the acceptance of the proposed WDP freight train. The nominated position and position titles of the primary stakeholder reflects TfNSW's organisational structure at the time of publication of this standard. The rolling stock operator should seek clarification on from TfNSW if there are any doubts.

Table 1 - List of stakeholders in the WDP freight train operations approval process

Organisation (functional area)	Role or responsibility	Primary stakeholder
TfNSW (Freight Access and Performance)	Sponsor	Associate Director, Freight Access and Performance
Rolling stock operator	Technical and operations sign-off for compliance with WDP freight train operations risk assurance requirements	Rolling stock operator representative with engineering and operations authority
TfNSW (Engineering)	Technical acceptance and interdisciplinary co-ordination	Lead Rolling Stock Engineer
TfNSW (Safety and Risk Assurance)	Risk management process	Manager, Safety and Risk Assurance
Sydney Trains (Network Rules and Procedures)	Network rules and procedures	Manager, Network Rules & Projects
TfNSW (Service Planning)	Running time calculation, standard working timetable (SWTT) train paths and timetable data	Director, Rail Service Development and Timetable Delivery

Organisation (functional area)	Role or responsibility	Primary stakeholder
Sydney Trains (Service Planning)	Daily working timetable (DWTT) amendments and ad hoc additional services adjustments	Director, Short Term Planning
Sydney Trains (Service Delivery)	Train service delivery and incident management	Head of Service Delivery

The approval of WDP freight trains occur in two phases. First a train operating conditions (TOC) waiver will be issued to the rolling stock operator upon the sign-off of the risk and assurance report. The TOC waiver outlines the operating conditions for the proposed WDP freight train. The TOC waiver may also contain additional requirements for the rolling stock operator to demonstrate such things as reliability targets or undertake such things as stopping distance tests where it is not possible to fulfil the additional requirements without operating the train.

Once all conditions in the TOC waiver and agreed success factors between TfNSW and the rolling stock operator have been met, the proposed WDP train and its associated operating conditions are published in TS TOC 1 and TS TOC 2 *Train Operating Conditions (TOC) Manual – Division Pages*.

Note: TS TOC 1 and TS TOC 2 content is considered business as usual operations on the TfNSW Metropolitan Heavy Rail Network.

Refer to Section 6 for requirements associated with TfNSW engagement and approval.

6. WDP freight train operations risk assurance requirements

All requirements in Section 6.1 to Section 6.9 are numbered in the format of 'WDP.', followed by a series of letters and numbers. Each individual number indicates a standalone requirement.

6.1. Pre-requisites

WDP.1: The rolling stock operator shall consider and propose rolling stock that have been network accepted (published in TS TOC 1) or operating under a TOC waiver for the proposed WDP freight train.

Network accepted rolling stock carry operating conditions that influence the operations concept and maintenance concept.

WDP.2: The rolling stock operator shall propose and seek in principle agreement regarding the success factors with all stakeholders in Table 1 for the proposed WDP freight train before or during initial engagement.

Success factors in this standard refers to items that are crucial to introducing the proposed WDP freight train into the business as usual operating environment. This may be expressed in as follows (qualitative or quantitative):

- *technical and operational reliability targets*
- *frequency and severity of WDP freight train induced incidents on the network*
- *the number of WDP freight train induced complaints*
- *commitment to the operational concept definition via creation and confirmation of train paths*
- *level of compliance with TfNSW standards*
- *availability of standard operating procedures on managing the proposed WDP train for both the operator and network controller*

6.2. Operational concept definition

WDP.OC.1: The rolling stock operator shall define an operations concept for the proposed WDP freight train.

WDP.OC.2: The operations concept definition shall outline the following as a minimum:

- the operating route(s)
- train consist for each WDP freight train proposed – this includes the following:
 - the number and type of locomotives and their position in the consist
 - the number and type of wagons and their position the consist
 - train length
 - loaded and empty train mass
 - loading arrangements (for example short loading or empty wagons in loaded consist)

Operating empty wagons in a loaded consist is not recommended

- synchronous or asynchronous WDP operation
- proposed and intended train path
- expected or intended running times
- shunting arrangements into and out of the loading/unloading facility, including ground support crew (for example third crew ready and waiting at mine or port to support setting back)

- train recovery covering the scenario of
 - failed rolling stock
 - derailments
 - assisting other trains
 - assisted by other trains

WDP.OC.3: The operations concept definition shall, where reasonably practicable contain potential variations and future WDP operations related to the proposed WDP freight train.

WDP.OC.4: The rolling stock operator shall notify TfNSW if there is a change to in the operations concept.

TfNSW will undertake a judgement of significance assessment and determine if the change requires a (separate) full approval.

6.3. Maintenance concept definition

WDP.MC.1: The rolling stock operator shall define a maintenance concept for the proposed WDP freight train.

WDP.MC.2: The maintenance concept definition shall outline, as a minimum:

- a general overview of the rolling stock maintenance regime
- spare/standby locomotives and wagons
- any differences compared to a HEP freight train and justification
- any differences to the rolling stock operator's WDP freight trains operating on other networks (if any) and justification

6.4. Risk management

WDP.RM.1: The rolling stock operator shall undertake a risk analysis for the proposed WDP freight train.

WDP.RM.2: The risk analysis shall identify and list out all the risks, hazards and events that are specific to the proposed WDP freight train based on its operations concept and maintenance concept.

WDP.RM.3: The risk analysis shall, as a minimum, cover all events listed in the prepopulated WDP train hazard log in Appendix A that are applicable to the proposed WDP freight train.

It is the rolling stock operator's responsibility to insert any risks, hazards and events identified in WDP.RM.2 but not listed on the prepopulated WDP train hazard log.

WDP.RM.4: The risk analysis shall utilise the risk likelihood table, consequence likelihood table, risk matrix and risk rating in T MU MD 20002 ST *Risk Criteria for Use by Organisations Providing Engineering Services* to assess all risks.

WDP.RM.5: The rolling stock operator shall provide details on what actions have been taken to ensure all risks identified for each event of proposed WDP freight train is safe and reliable SFAIRP.

Example of actions relevant to the context of WDP freight trains include:

- *Elimination: Deploying only one type of locomotive to the proposed WDP freight train to ensure no mixing of ECP and non-ECP locomotives in the train consist.*
- *Substitution: Modify crew change or train idling locations where remote locomotives have been identified or reported to be stopping at locations that are sensitive to noise and exhaust emissions.*
- *Isolation: Staffing all train crew in lead locomotive groups on mainline operations to ensure crew exposure to exhaust emissions in tunnels, in the event of a train failure in a tunnel is managed at one single location.*
- *Engineering: Analyse train forces to demonstrate they are within safe limits under all events identified in the risk analysis.*
- *Administration: Developing train handling notes and fault finding guides for train crew to use under normal and degraded operations for the proposed WDP operations.*
- *Personal Protective Equipment: Equipping crew cabs in the remote locomotive (if the isolation control described above cannot be achieved) with breathing apparatus (with training) for crew use to manage exhaust fume hazards associated with tunnel operation.*

WDP.RM.6: There shall not be any events with a residual risk ratings of A or B.

WDP.RM.7: The risk analysis shall be documented in the form of a hazard log using the template provided in Appendix A.

6.5. Risk and safety assurance report

WDP.AR.1: The rolling stock operator shall prepare and submit a risk and safety assurance report for the proposed WDP freight train to TfNSW.

WDP.AR.2: The risk and safety assurance report shall include, as a minimum all dot points listed under Section 5.2.2.

WDP.AR.3: The risk and safety assurance report shall follow the document structure outlined in Appendix B.

WDP.AR.4: The risk and safety assurance report shall be signed off by all stakeholder representatives listed in Table 1.

6.6. Verification and validation

WDP.VV.1: The rolling stock operator shall verify the proposed WDP freight train is safe and reliable SFAIRP through verifiable evidence.

See Section 5.2.3 for further guidance.

WDP.VV.2: All evidence to support verification of safe and reliability SFAIRP shall be included as part of the risk and safety assurance report submission.

Claims without supporting evidence are considered not sufficient to support the demonstration that the proposed WDP freight train is safe and reliable.

WDP.VV.3: Simulation software used for full and advanced engineering analysis on in-train forces shall be an industry-recognised dynamics tool.

Refer to Appendix C of Code of Practice - Distributed Power Freight Trains for definitions on full and advanced analysis.

WDP.VV.4: Simulation software used for full and advanced engineering analysis on in-train forces shall be validated by a qualified engineer or specialist as being suitable for simulation of in-train forces.

The supplier of the simulation software should be able to provide evidence of its validation and suitability for its application to train dynamics studies.

If evidence of the simulation software's validation and suitability for application is lacking, physical testing should be used to validate key modelling elements of a train simulation model and confirm the parameters used.

WDP.VV.5: The use of reliability data from other WDP operations with similar operations and maintenance concepts to the proposed WDP freight train on assurance of its indicative performance shall be normalised.

The use of any proprietary information requires consent from the data owner.

Reliability data from other WDP operations should not be used if the operations and maintenance concepts differs significantly with the proposed WDP freight train.

WDP.VV.6: The use of other WDP operation case histories and assumptions shall have valid applicability to the proposed WDP freight train.

For example, asynchronous specific operational practices will not be applicable on a proposed synchronous WDP freight train.

WDP.VV.7: Documentation developed for the proposed WDP freight train shall be in a complete and approved state at the time of submission to TfNSW.

Complete and approved state refers to a non-draft, for release version within the rolling stock operator's organisation. It is expected that the rolling stock operator signs the risk and safety assurance report at the time of submission however there are to be no other signatories as listed in Table 1 at this stage.

All documentation developed should have received some form of in principle endorsement or approval at the time of submission. Refer to WDP.E.3c.

6.7. Stakeholder engagement

WDP.E.1: The rolling stock operator shall engage with TfNSW stakeholders listed in Table 1 through the WDP freight train operations approval process.

WDP.E.2: Prior to commencement of any advanced analyses, software validation described in WDP.VV.4 shall be provided to TfNSW to determine its sufficiency.

This provides an opportunity for rolling stock operators to seek clarifications on simulation relevant requirements and gain confidence to engage professionals to undertake the in-train forces simulation work.

WDP.E.3: The rolling stock operator shall, as a minimum engage the relevant TfNSW stakeholder at the follow stages:

- a. Preliminary: At this stage the high level operations and maintenance concepts shall be explained to TfNSW, specific risks on the proposed WDP freight train shall be co-identified and an in-principle consensus on what level of assurance is required shall be reached. The discussion and agreement on the success factors (WDP.2) shall also occur at this stage.
- b. Development: At this stage the WDP train hazard log and risk and safety assurance report shall be in an advanced draft. Any analyses or supporting documentation development shall have begun.

The rolling stock operator should work collaboratively with TfNSW before the formal engagement by asking questions and seeking clarification on any items of uncertainty.

- c. Risk assurance report sign-off: At this stage the WDP train hazard log, risk and safety assurance report and any supporting documentation shall be ready for submission to TfNSW for sign-off.

It is expected that any questions raised by any stakeholders listed in Table 1 are either already addressed or require minor amendments to the to be submitted documentation pack.

WDP.E.4: The rolling stock operator shall present their final proposed operation, together with the safety assurance plan and recovery plan to TfNSW for agreement and sign off at stage c of WDP.E.3.

6.8. Approval

WDP.A.1: The rolling stock operator shall comply with all operating conditions outlined in the TOC waiver issued for the WDP freight train following TfNSW's sign-off of the risk and safety assurance report.

WDP.A.2: The rolling stock operator shall undertake additional assurance activities listed in the TOC waiver and provide verifiable evidence to demonstrate the outcomes meet the appropriate TfNSW standard or requirement.

Such assurance activities may include stopping distance tests, recording and reporting of running times and software upgrade across fleet.

WDP.A.3: The rolling stock operator shall review and demonstrate that all success factors determined in WDP.2 have been met prior to publication of the WDP freight train in the TOC manual.

6.9. Continuous Improvement

WDP.CI.1: Following approval, the rolling stock operator shall regularly review and update the WDP train hazard log and other WDP operating documents as required.

The Code of Practice - Distributed Power Freight Trains contains additional continuous improvement recommendations for WDP operations.

Appendix A WDP freight train risk analysis template

A standardised risk analysis template in a excel spreadsheet format is embedded in Appendix A. for rolling stock operators to use as part of their assurance for the proposed WDP freight train.

Columns A to I in the spreadsheet have been pre-populated by TfNSW and provides a baseline for rolling stock operators to undertake the appropriate assurance activities to ensure the safety and reliability of the proposed WDP freight train.

The likelihood and consequences assigned have taken into consideration ratings from previously approved WDP freight trains, from a TfNSW perspective.

Cell in Columns J to O are blank and requires rolling stock operators to complete, which includes

- the various actions undertaken to ensure all the identified risks in the first part of the template have been managed SFAIRP
- verification or evidence supporting the assurance activity
- the residual risk following the assurance activity



Appendix A WDP
freight train risk ana

Appendix B Generic risk and safety assurance report structure

A risk and safety assurance report structure is provided to rolling stock operators as guidance and also for consistency in submissions to TfNSW.

Note: The structure has been developed based on previous WDP freight train approval best practices.

The key headings and suggested content for a WDP freight train risk and safety assurance report is outlined in Table 2.

Table 2 - WDP freight train risk and safety assurance report structure

Heading	Suggested content	Relevant sections / requirements
Title page	N/A	N/A
Revision history	Version control and summary of changes	N/A
Table of Contents	N/A	N/A
1. Background / Introduction	<ul style="list-style-type: none"> Driver for proposed WDP freight train Previous WDP operational experience in the business 	N/A
2. Reference documents	Documents referred to in the report and a listing of all documentation associated with the assurance for the proposed WDP freight train.	Section 5.2.3
3. Operation concept and maintenance concept	<ul style="list-style-type: none"> An outline of the operation and maintenance concept of the proposed WDP freight train. List out the agreed in principle success factors 	WDP.OC.1 WDP.OC.2 WDP.OC.3 WDP.MC.1 WDP.MC.2 WDP.2
4. Assurance	<ul style="list-style-type: none"> A summary of the risk analysis and discussion of the key risks associated with the proposed WDP freight train A summary of the actions taken by the rolling stock operator to ensure the proposed WDP freight train is safe and reliable SFAIRP Evidence to demonstrate SFAIRP 	N/A
4.1 Risk analysis	<ul style="list-style-type: none"> Analysis methodology Additional risks or hazards identified but not covered by the prepopulated WDP train hazard log in Appendix A. Risks or hazards in the prepopulated WDP train hazard log that are not applicable to the proposed WDP freight train Residual risk ranking distribution 	WDP.RM.1 WDP.RM.2 WDP.RM.3 WDP.RM.6

Heading	Suggested content	Relevant sections / requirements
4.2 Risk and safety assurance	<ul style="list-style-type: none"> • Discussion on key risks and hazards (for example excessive in-train forces and train failure and recovery) • Proposed controls and appropriateness of the proposed controls • Justification, supported by evidence to demonstrate that the proposed WDP freight train is safe and reliable SFAIRP 	Section 5.2.3 WDP.RM.5 WDP.VV.2
5. Stakeholder consultation	Summary of engagements with TfNSW stakeholders	WDP.E.1 WDP.E.2 WDP.E.3
6. Operating conditions	<p>Operating conditions for the proposed WDP freight train following risk analysis and stakeholder consultation. This may include:</p> <ul style="list-style-type: none"> • tractive effort and dynamic braking limits • loading limits • marshalling limits • special pre-start or maintenance instructions • special train handling instructions • special train recovery methodology • special shunting sequences • speed restrictions 	N/A
7. Assumptions and Dependencies	<p>A list of assumptions made by the rolling stock operator on the proposed WDP freight train and dependencies. This made include:</p> <ul style="list-style-type: none"> • adherence to the operating conditions imposed by TfNSW • train crew briefed and trained on special instructions • approval from other network manager (if operating across two networks) • rolling stock operator will inform TfNSW on new or change or operations concept, maintenance concept and risk • access agreements with TfNSW in place • rolling stock operator accredited and Office of the National Rail Safety Regulator (ONRSR) briefed 	WDP.CI.1
8. Endorsement / signoff	Dated signatory of all stakeholders in Table 1, preferentially in the listed order	WDP.AR.4
Appendices	WDP train hazard log for the proposed WDP freight train	WDP.RM.7