
Road Rail Workshops:

Brisbane – 21 May 2013

Sydney – 27 May 2013

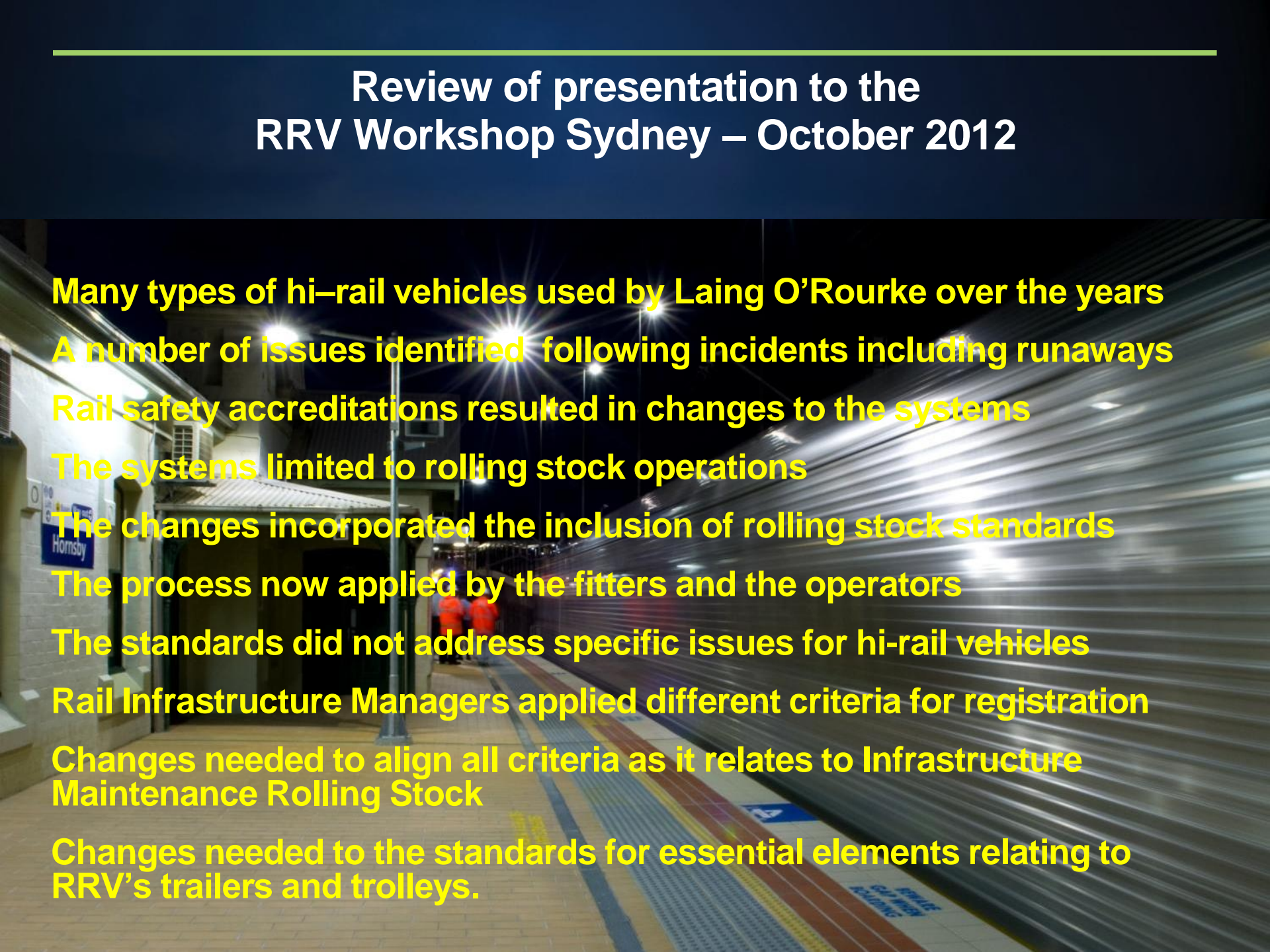
Adelaide – 3 June 2013

Presented by Lindsay Holt

Rail Safety & Compliance Manager

Laing O'Rourke Australia Construction

Review of presentation to the RRV Workshop Sydney – October 2012

A blurred high-speed train is shown at a station platform at night. The train is moving from right to left, creating a significant motion blur effect. The platform is illuminated by overhead lights, and a few people in orange safety gear are visible in the distance. The background shows the structure of the station and some lights.

Many types of hi-rail vehicles used by Laing O'Rourke over the years
A number of issues identified following incidents including runaways
Rail safety accreditations resulted in changes to the systems
The systems limited to rolling stock operations
The changes incorporated the inclusion of rolling stock standards
The process now applied by the fitters and the operators
The standards did not address specific issues for hi-rail vehicles
Rail Infrastructure Managers applied different criteria for registration
Changes needed to align all criteria as it relates to Infrastructure
Maintenance Rolling Stock
Changes needed to the standards for essential elements relating to
RRV's trailers and trolleys.

RRV Workshop Brisbane – Tuesday 21 May 2013

RRV Workshop Sydney – Monday 27 May 2013

Issues identified and discussed in greater detail

Good to have the author of the RRV Standard in attendance

Significant differences in infrastructure maintenance vehicles used across the country including tractors to shunt 120 tonne with only tractor tyre brakes, distances travelled in remote areas

Rather than apply the RRV configuration of 9A, 9B and 9C, consider possession work vs track travel (as well?)

Standards need to be understood by the people required to apply the process

Need industry representatives to assist in the development of standards – from all sectors

ARA Risk Register to be added to the bowties to assist the standards development

Units of competence need to incorporate aspects from the bowties conducted at initial workshop in October 2012

Competency is a significant issue in relation to the use and management of hi-rail vehicles

Roads Authorities are an issue to be addressed as they are applying different rules in parts of the country – hi-rail gear, super singles.

Designers, manufacturers and certifiers – all play a major role with RRVs provided to industry

Certification vs Registration – what each process entails – the need for common terminology

The systems

Relating to rolling stock operations

- 
- E-T-8-1916A – Procurement of Rolling Stock
 - E-T-8-1917 – General Engineering and Operational Systems
 - E-T-8-1917A – Commissioning of Rolling Stock
 - E-T-8-1917B – Monitoring, Repair and Maintenance of Rolling Stock
 - E-T-8-1917C – Modification of Rolling Stock
 - E-T-8-1917D – Decommissioning of Rolling Stock
 - E-T-8-1917E – Incident Management of Rolling Stock
 - E-T-8-1917F – Design Management of Rolling Stock
 - E-T-8-1917G – Operation of Event and Distance Recorders
 - E-T-8-1917H – Rail Wheel Inspection
 - E-T-8-1917I – Travelling of Track Machines
 - E-T-8-1917J – Registration of Rolling Stock
 - E-T-8-1917k – Railway Track Signals
 - E-T-8-1917l – Rolling Stock Plant and Equipment Safety
 - E-T-8-1917M – Rolling Stock Brakes
 - E-T-8-1919a – Asset Management of Rolling Stock

The Standards review against the SMS


AS 7509.4 Dynamic Behaviour									
Sect	CI	Requirement	Type	ML		Poss		HiR	
				N	E	N	E	N	E
1.4		PURPOSE							
1		This Standard describes the dynamic behaviour requirements for infrastructure maintenance rolling stock to reduce the risk of derailment as well as to reduce the likelihood of accelerated degradation of the infrastructure.	SUP						
1.5		SCOPE							
1		This standard sets the minimum requirements for the dynamic performance of infrastructure maintenance rolling stock, both New Rolling Stock and Modified Rolling Stock, intended for operation on a Railway Network.	SUP						
2		EVALUATION AND TESTING							
2.1		SCOPE							
1		The dynamic behaviour of new or modified infrastructure maintenance rolling stock that travels outside work closures shall be evaluated for:	MAN						
	1(a)	Hunting as per Section 3	MAN						
	1(b)	Base Ride Accelerations as per Section 4	MAN						
	1(c)	Horizontal and Vertical Curve Negotiation as per Section 5	MAN						
	1(d)	Transition Curve Negotiation as per Section 6	MAN						
	1(e)	Rollover as per Section 7	MAN						
	1(f)	Curving Stability as per Section 10	MAN						
2		The dynamic behaviour of new or modified infrastructure maintenance rolling stock that travels outside work closures should be evaluated for:	REC						
	2(a)	Negotiation of Isolated Track Irregularities as per Section 8	REC						
	2(b)	Negotiation of Cyclic Track Irregularities as per Section 9	REC						
	2(c)	Wind Loading as per Section 11	REC						
6		The assessment of the dynamic behaviour of new or modified infrastructure maintenance rolling stock when in work mode or travelling inside work closures should identify the expected track conditions that the vehicle would be likely to operate over and the tolerability of wheel unloading and derailment.	REC						
2.2		ROLLING STOCK CONDITIONS							
7		Rolling stock being tested in a Simulated Service Worn Condition should have damping devices replicated to be worn to within 10% of condemning limits.	REC						
2.3		TRACK CONDITIONS							
2		Track data for dynamic behaviour modelling should have a similar frequency spectrum and amplitude of irregularities to the actual track that the vehicle will operate on.	REC						
2.4		MODELLING							
4		Dynamic behaviour simulation software shall have been validated as being suitable for modelling the type of vehicle and bogie arrangement being assessed.	MAN						
5		Physical testing should be used to validate key elements of the vehicle model and confirm the parameters used.	REC						
2.5		PHYSICAL TESTING							
1		Test equipment used to physically measure rolling stock dynamic behaviour shall have current calibration certificates covering the measurement range applicable to the test.	MAN						
2		The type, calibration details and location of all measuring instruments used during rolling stock dynamic behaviour physical testing shall be recorded in the test reports.	MAN						

Sect	CI	Requirement	Type	ML	Poss	R/R	RSU	AS Standard	Note:
				N	E	N	E		
		MAINTENANCE						AS7507.4 Rolling Stock Outlines	
	1	The Vehicle shall be maintained to the dimensions and tolerances of the Candidate Static Outline and Candidate Basic Kinematic Outline.	MAN						
	7	OUT OF GAUGE ROLLING STOCK							
	1	Out of Gauge Rolling Stock may be permitted to operate by the Track Manager, but may have operational constraints, limitations or special conditions placed upon it.	SUP						
	4.1	WHEEL PROFILE						AS7508.4 Track Forces and Stresses	
	1	Wheel profiles approved by Track Managers are listed in AS 7514.4.	SUP						Note: RSMS Element PO217H mandates w/ management practices
	5.3	VEHICLE TO VEHICLE CLEARANCE						AS 7509.4 Dynamic Behaviour	
	5.3.1	Method							
	2	Checks shall be undertaken to verify that no damage or unintended contact occurs between components of the vehicle when it is coupled to other vehicles in service when traversing the track geometry scenarios given in Section 5.2.	MAN						
	5.4	VEHICLE TO BOGIE CLEARANCE							
	5.4.1	Method							
	1	Checks shall be made that adequate clearance exists between the vehicle underframe and its bogies, wheelsets or wheels.	MAN						
	2.2.10	Maintenance Diagnostics							
	1	The Stopping Brakes shall incorporate means for static testing during maintenance to evaluate braking performance.	MAN						
	4.2	AIR BRAKED VEHICLES							
	4.2.1	Requirements							
	3	Spring loaded type brake rigging pin securing devices such as 'R' clips, Grip clips, or Lynch pins shall not be applied in positions below axle centrelines.	MAN						
	4	Below axle centrelines, split cotter pins shall be applied to secure brake rigging pins.	MAN						
	5.1	GENERAL							
	12	Vehicles shall be fitted with safety straps, or similar, to contain all body and bogie mounted brake rigging.	MAN						
	6.2	FUNCTION CHECKS - SERVICING							
	1	A Vehicle Brake System Function Check shall be undertaken to confirm serviceability when Brake System components are replaced and reconnected on a Vehicle following component repair, replacement or disconnection in the field.	MAN						
	2	The results of Brake System Function Checks shall be recorded and the documentation retained for reference.	MAN						
	9	DETERMINATION OF BRAKING PERFORMANCE							
	9.1	GENERAL							
	1	Brake System performance shall be determined by testing.	MAN						
	9.2	STATIC BRAKE TEST							
	9.2.1	Requirements							
	1	A static brake test conducted on a Vehicle shall establish whether its Brake System achieves the required performance.	MAN						
	9.2.3	Reasons for Conducting a Static Brake Test							
	1	A Static Brake Test shall be performed in the following circumstances:	MAN						

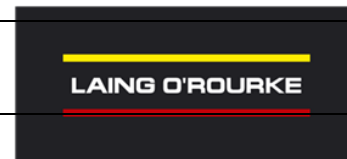
Note: Brake tests are mandated whenever re

The forms – annual inspection

Visual forms part of the process

	Procedure Title	Plant and Machinery Compliance Annual Inspection			
	Document No.				Plant
	Issue	04			
	Date	April 2010			
	Page	1 of 6			

MACHINE ASSESSMENT REPORT – <i>(To be carried out on request)</i>				
All checks should include a general examination for security, integrity, and safety and should be considered from a maintenance and operational view against maintenance standards.				
Any signs of damage or wear should be noted, along with any missing components and added to the maintenance sheet.				
Machine No. -			Location	
Contract -			Date	
No	System	Applicable Standard or Procedure	Non conformance	Comments
1.	Engine + Protection (Check all hoses and wires for damage and check for any other loose or damaged components)	visual check	•	
	Engine No.		•	
	Engine Hours		•	
2.	Hydraulics (Include pumps, motors etc...)	visual check & function test / pressure test	•	
	Hydraulic Hoses (Check hoses and fittings for leaks and filters leaks)	visual check	•	
3.	Pneumatic Air System (Include valves & pipes, compressor etc...)	visual check & function test	•	
4.	Brake System	AS7510 4(Draft)	• Brake system function test	



The forms – annual inspection

Aligned to relevant Australian Standards

	(Includes brake shoes, rigging, cylinders, brake hoses etc...)	RSU 712 (Rail mounted vehicles) RSU 722 (Road/rail vehicles)	<ul style="list-style-type: none"> required Brake rigging securing devices incorrect Safety straps missing/broken Stopping distances incorrect 	
5.	Emergency Equipment	Section 9 of RailCorp TOC AS7523.4	<ul style="list-style-type: none"> Emergency equipment missing Equipment stored incorrectly Spares missing 	
6.	Wheel-sets for Rail Bound Plant (Frames, axles, axle bearings, bolts etc.....)	AS7508.4 AS7514.4/ESH 0330 AS/515.4 AS/516.4 AS7517.4/RSU711 RSMS Procedure PO917.4 RSMS Procedure PO917E	<ul style="list-style-type: none"> Wheel profile defective Wheel defective Axle defective Bearing defective Back to back measurement incorrect Wheelset ex derailment 	
6A	Wheel-sets for Hi-Rail	DEM's	<ul style="list-style-type: none"> 	
6B	Bogies	AS7519.4 RSMS Procedure PO917H RSMS Procedure PO917E	<ul style="list-style-type: none"> Bogie structure defective Bogie ex derailment Bogie due scheduled service 	
7.	Transmission/Power Take-Off	Oil sampling / function test	<ul style="list-style-type: none"> 	
8.	Electrical (Including wiring, relays batteries, battery isolation etc...)	Visual and function test	<ul style="list-style-type: none"> 	
	Lights, Siren & Horn (Operation, cleanliness etc...)	AS7531.4	<ul style="list-style-type: none"> Head-lights/marker lights defective Flashing beacons defective Stop lights defective 	

The forms – pre-hire

Signed off by a fitter against the same Australian Standards

LAING O'DOURKE

PRE-HIRE / OFF HIRE ROLLING STOCK CHECKLIST

Make & Model: _____

Date: _____

Hours/km: _____

Registration No: _____

Notes: ✓ - Item OK X - Item Requires Attention. NA - Not Applicable


ITEMS TO BE CHECKED	STANDARD	RSMS	Complete	Supporting Procedures Required
Hour-meter working				Visual check
Walk Around Inspection [Loose bolts, nuts, connections, etc] out of gauge items and signage/reflective delineators	AS7507.4 AS7531.4	917B		Visual check
Engine Oil Level				Visual check
Radiator / Coolant Level				Visual check
Fuel tank is to be filled if check is at Maitland				Visual check
Hydraulic Oil Level - top up as required				Visual check (see operators manual)
Hoses – condition & leaks				Visual check
Belts - condition & tension				Visual check & operators manual
Grease - if applicable				Visual check & lube chart
Cable Connections - tight & no damage				Visual check
Battery[s] - condition, levels, terminals, etc.				Visual check
Leaks - oil, fuel, water, air, etc.				Visual check
Exhaust - noise & emissions	AS7513.4	917B		Interior noise – OH&S issue. External noise is a RIM issue.
Gauges - operation & condition	AS7533.4	917B		A list of gauges/functions will be required for each vehicle type
Guards in place - secure & good condition	LORAC	917B		Visual check
Fire Extinguisher charged and in date	LORAC	917B		A list of fire extinguishers/types will be required for each vehicle type
Machine functions correctly				Function test
Alarms & shutdowns	LORAC	917B		A list of alarms/functions will be required for each vehicle type
Road Wheels / Tyres - condition, pressure, wheel nuts, etc.	LORAC	917H		LORAC standards for each vehicle type Note 2
Rail wheels/bogies/suspension	AS7509.4 AS7514.4 AS7515.4 AS7516.4 AS7517.4 AS7518.4 AS7519.4	917H		Fouling of wheels/bogies: visual check Wheels – profile, tread damage: gauges + Wheel Manual (PO917H) Axles – damage: visual check Bearings – loss of securing/grease: visual check Back to back after derailment: visual check + gauge (PO917H) Suspension – springs/dampers damage or missing: visual check Bogies – damage: visual check

LAING O'DOURKE

The forms – The Operator's pre-start checklist

A visual inspection

Notes: (v) Item OK (X) Requires Attention. (NA) Not Applicable

								PRE-START GENERAL PLANT CHECKLIST Trucks, Loaders, Fork lifts, Excavators, Compressors								Location	
Plant No:		Make & Model:		Project:				Contact		No:							
Registration No:		Week Ending:															
ITEMS TO BE CHECKED	MON	TUE	WED	THU	FRI	SAT	SUN	ITEMS TO BE CHECKED	MON	TUE	WED	THU	FRI	SAT	SUN		
Hour or Km Reading								Plant Security [locks & Guards]									
Drain Air Tanks								ROPS or FOPS									
Operators Manual & Log Book (if applic.)								Compulsory Signage [warnings, etc]									
Engine Oil - Top Up as required								Compressors									
Radiator / Coolant Level – Top Up as req'd								Air intake vacuum indicator									
Hydraulic Oil Level – Top Up as Req'd								Oil level in Air oil separator reservoir									
Fuel & Fluid Levels [brakes, p/steer,etc]								Air pressure regulator functioning									
Grease Machine [as per Lube Specs.]								Air supply free from oil contamination									
Battery, Belts [levels, terminals, cond.]								Air lines , safety clips, sealing rubbers									
Leaks [Oil, Water, Fuel, Air, etc]								DEFECTS	DAY	REPORTED to	Cleared by		Date				
Cabin, seat, seatbelts, levers & controls																	
Windows, Wipers, Gauges & Horn																	
Lights, Indicators – operation & damage																	
Fire Extinguisher & First Aid kit																	
Neutral Start –Reversing alarm																	
UHF Radio, A/cond., accessories, etc																	
Foot & Park Brake Operation,								Defects to be Reported to & Cleared by :- Supervisor /Foreman									
Amber Light fitted & operational								IMPORTANT NOTE:									
Wheels, Tyres or Tracks, Wheel Chocks								If Defect is a Safety Hazard or requires Immediate repair : PARK UP MACHINE									
Panel Damage & Light Damage								Attach an OUT of SERVICE tag, contact Supervisor & don't use until Supervisor signs Cleared by & Date columns									
Exhaust: noise & emissions								COMMENTS:									
Hi Rail Equipment, operation, wear																	
TRUCKS / HIAB type CRANE TRUCKS - extra checks																	
Ropes, Tie Down Strap & Chains, etc.																	
Tipper / Tailgate : operation & condition								NEXT SERVICE DUE at :hours on[date]									
133a Electrical Warning Plate								Operator to Fill in Below & mark applicable boxes for each day used									
Lifting Gear- as supplied								Mon. Operator (print)									
Tare, GVM, & S.W.L. clear								Tue. Operator (print)									
Any Damage to components								Wed. Operator (print)									
Loader, Forklift, Roller, Excavators, etc - extra checks								Thu. Operator (print)									
Buckets, Teeth, Forks, etc								Fri. Operator (print)									
General Operations								Sat. Operator (print)									
Articulated Joint / Linkages								Sun. Operator (print)									

LAING O'ROURKE

Distribution: **White** – Select Depot **Yellow** – Site Office **Green** – Book

Supervisor Checked & Received [sign] _____

RRV and the changes made



RRV and the changes made

Disc brakes were fitted to the hi-rail wheels



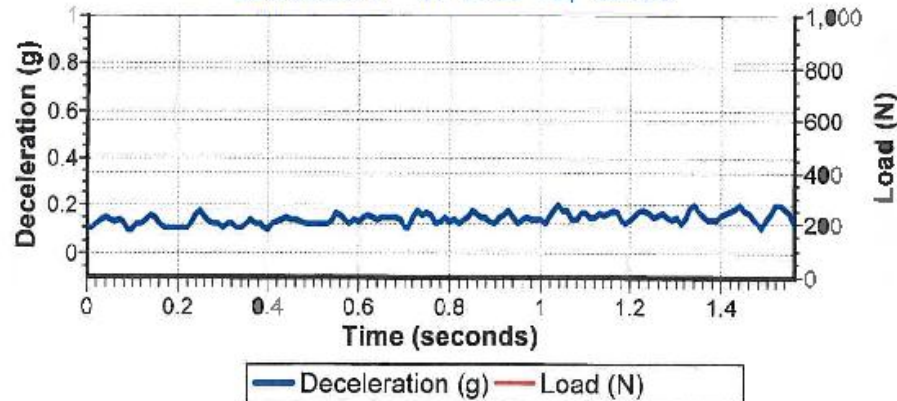
The results

AutoTest Brake Meter Download



Registration: EXRM001
 Test Date: 07 Dec 12
 Test Time: 09:30
 Average Deceleration: 0.14 g
 Maximum Deceleration: 0.20 g
 Test Duration: 1.57 s
 Speed: 8.0 km/h
 Stopping Distance: 1.7 m
 MFDD: 1.40 m/s²
 ID: MELROSEHYDS
 Calibrated by: Autotest
 Calibrated on: 30 Jan 12
 Recalibration in: 1 year(s)
 Serial Number: 29460
 Version: Version 7.23

EXRM001: 07 Dec 12, 09:30

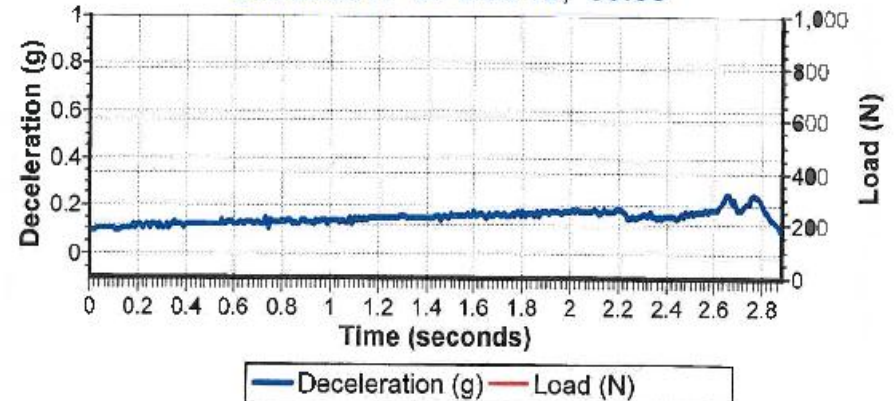


AutoTest Brake Meter Download



Registration: EXRM001
 Test Date: 07 Dec 12
 Test Time: 09:39
 Average Deceleration: 0.16 g
 Maximum Deceleration: 0.26 g
 Test Duration: 2.89 s
 Speed: 15.5 km/h
 Stopping Distance: 8.2 m
 MFDD: 1.50 m/s²
 ID: MELROSEHYDS
 Calibrated by: Autotest
 Calibrated on: 30 Jan 12
 Recalibration in: 1 year(s)
 Serial Number: 29480
 Version: Version 7.23

EXRM001: 07 Dec 12, 09:39



The registration process

The process is supported by a flowchart

Element 17 • P0917J

1/1

Rail Safety Management Procedure

General Engineering and Operational Systems - Registration of Rolling Stock

LAING O'ROURKE

Rail Safety Management Procedure

General Engineering and Operational Systems – Registration of Rolling Stock

Revision	Date	Comments
1	November 2011	Initial Document
2	February 2012	RISSB Standards included as reference and title changed to Registration of Rolling Stock
3	April 2012	Reviewed as part of continuous improvement process. Renaming of appointments & Forms
4	February 2013	Reviewed in line with legislative changes and Company responsibilities

Element 17J

General Engineering & Operational Systems – Registration of Rolling Stock

LAING O'ROURKE

Documentation	Process	Responsibility
	Details of proposed rolling stock provided to Rail Safety and Compliance Manager	Rail Plant Manager
	New Rolling Stock advised to Rail Regulator	Rail Safety and Compliance Manager
Procurement of Rolling stock E-P-8-1916A	Procurement and commissioning of rolling stock completed	Rail Plant Manager
Commissioning of Rolling stock E-P-8-1917A	Risk Assessment of Rolling stock including hi-rail vehicles undertaken	Select Area Manager
Commissioning of Rolling stock E-P-8-1917A	Rolling stock standards applicable for registration to be obtain from RIM	Select Area Manager
Commissioning of Rolling stock E-P-8-1917A	Inspection and compliance with RIM rolling stock standard results in registration for use on RIM's railway	Select Area Manager
	Item of rolling stock included in Rim's Train Operating Conditions Manual	
	Item of rolling stock to be incorporated in Laing O'Rourke Asset Management Program	Select Area Manager

LAING O'ROURKE

The items considered for inclusion in the registration process

Registration

Twist Test

Brake Test

Rolling Stock Outline

Electrical

Ride Stability Test

Flashing Light – Linked

Reversing Beeper

Reversing Camera

Insulated Wheels

Super Singles

Twin Tyred

ROPs / FOPs

Vigilance Control

Event Recorder

Distance Recorder

Engineer's Report

Re-Registration

Interlocking Systems

Visual Displays

Operator Control Device

Audible Warning Device

Height / Slew / Reach Indicator

Hi-Rail Guidance Compliance Plates

Vertical Load

Safe Working Load

Parking Brake Capability

Speed Indicator Device

EWPs Compliant to AS 2550

Axle Load Compliant

EPA Noise and Vibration Control

LAING O'ROURKE

Many variations between Rail Infrastructure Managers

[illegible]

Rail safety management systems update

Element 17 - E-T-8-1917H

1/1

Rail Safety Management Procedure

General Engineering and Operational Systems - Rail Wheel Inspection

LAING O'ROURKE

Element 17 • E-T-8-1917M

Rail Safety Management Procedure

General Engineering and Operational Systems - Rolling Stock Brakes

LAING O'ROURKE

Rail Safety Management Procedure

General Engineering and Operational Systems – Rail Wheel Inspection

Rail Safety Management Procedure

General Engineering and Operational Systems - Rolling Stock Brakes

Revision	Date	Comments
1	January 2011	Procedure developed to support SMS and legislative requirements.
2	April 2011	Review to align to revised processes
3	January 2012	RISSB Standards added as reference plus more technical detail
4	April 2012	Inclusion of measurements and development of Form for recording.
5	February 2013	Changes in line with legislative changes and Company responsibilities

Revision	Date	Comments
1	May 2013	Procedure developed.

LAING O'ROURKE

AS 7510.4 Infrastructure Maintenance Rolling Stock Part 4 – Braking Systems
AS 7514.4 Infrastructure Maintenance Rolling Stock Part 4 – Wheels

SECTION	CLAUSE	REQUIREMENTS	TYPE	C	SOURCE	HAZARD	IC	Background Information	Reviewer Comments	SECTION	CLAUSE	REQUIREMENTS	TYPE	HAZARD	IC	Background Information		
1		INTRODUCTION								1		INTRODUCTION						
		DISCLAIMER	HED									IMPORTANT NOTICE AND DISCLAIMER	HED					
	1	This document is a draft only and has been issued solely for the purposes of development within the rail industry.	SUP	C							1	The Rail Industry Safety & Standards Board ("RISSB") provides a range of products, collectively called the "RISSB Products", including:	SUP					
	2	The document incorporates feedback from the Australian rail industry and will be finalised following further feedback on its accuracy and appropriateness.	SUP	C							1(a)	- Standards;	SUP					
	3	The document is not intended for implementation in its draft form and no reliance shall be placed on the accuracy or appropriateness of its content.	SUP	C							1(b)	- Codes of Practice;	SUP					
	4	The RISSB disclaims any liability or responsibility to any person in respect of any consequences flowing from the use of this document in whole or in part for any purpose other than the purpose of providing comments to the RISSB on its content.	SUP	C							1(c)	- Rules;	SUP					
1.2		DOCUMENT CONTROL								1.1	1(d)	- Guidelines; and	SUP					
	1	Document Title: Railway Rolling Stock - Braking Systems - Part 4: Infrastructure Maintenance Rolling Stock	SUP								1(e)	- Handbooks.	SUP					
	2	Number: AS 7510.4	SUP								2	RISSB does not undertake a full risk assessment of the RISSB Products it develops due to the diverse operating environments operating across Australia.	SUP					
	3	Version: Draft 5.0	SUP								3	Rather it identifies the hazards that must be addressed on the Australian Rail Network and develops products to accommodate these.	SUP					
	4	Publication Date: 05 April 2013	SUP								4	Responsibility rests with the rail organisation, should it choose to adopt a RISSB Product, to ensure that the RISSB Product is safe for use on the network on which it is intended to be used.	SUP					
		CONTENT	HED								5	This would include a risk assessment.	SUP					
1.3		Table of Contents	HED							1.2	6	RISSB and all persons acting for RISSB in preparing a RISSB Product disclaim any liability or responsibility to any person for any consequences arising directly or indirectly from the use by the rail industry or rail organisations of the RISSB Product in whole or in part, and whether or not in conjunction with, or as a supplement to, the guidelines which the rail industry or rail organisation currently uses.	SUP					
	1	1. INTRODUCTION	SUP								7	Users of the RISSB Products should be aware that, while using the RISSB Products, they must also comply with any relevant Commonwealth, State or Territory legislation relevant to their operations.	SUP					
	2	1.1 Disclaimer	SUP								8	Adherence to the RISSB Products does not replace or exclude the application of such legislative requirements.	SUP					
	3	1.2 Document Control	SUP								9	Users are responsible for making their own enquiries in relation to the application of legislation, and the framers of the RISSB Products accept no responsibility in this regard.	SUP					
	4	1.3 Content	SUP								10	Adherence to the RISSB Products does not necessarily ensure compliance with any relevant national guidelines, standards and codes of practice.	SUP					
	5	1.4 Purpose	SUP								11	Users are responsible for making their own enquiries in relation to compliance with national standards, guidelines and codes of practice.	SUP					
	6	1.5 Scope	SUP								12	While all reasonable care has been taken in the preparation of this RISSB Product, it is provided to rail operators without any legal liability on the part of RISSB and RISSB publishers, authors, consultants and editors, each take no responsibility for loss suffered by any person resulting in any way from the use, or reliance on this RISSB Product.	SUP					
	7	1.6 Compliance	SUP								13	© Rail Industry Safety & Standards Board	SUP				www.rissb.com.au	
	8	1.7 Reference Documents	SUP									DOCUMENT CONTROL	HED					
	9	1.8 Definitions	SUP									Identification	HED					
	10	2. AIR BRAKE SYSTEM	SUP								1	Document Title - Railway Rolling Stock - Wheels - Part 4: Infrastructure Maintenance Rolling Stock	SUP					
	11	2.1 General	SUP								2	Number: AS 7514.4	SUP					
	12	2.2 Stopping Brake Performance	SUP								3	Version: 1.0	SUP					
	13	2.3 Park Brake Performance	SUP								4	Publication Date: 18 March 2010	SUP					
	14	3. CALCULATION OF BRAKING SYSTEM PERFORMANCE	SUP									Preparation and Approval	HED					
	15	3.1 Stopping Brake	SUP								1	Prepared by: RISSB Rolling Stock Standards Group	SUP					
	16	3.2 Park Brake	SUP								2	RISSB Board Approval Date: 17 March 2010	SUP					
	17	3.3 Coefficient of Friction	SUP									Distribution and Change	HED					
	18	3.4 Brake System Software	SUP									1	The current version of this standard is available from the RISSB website at www.rissb.com.au.	SUP				
	19	4. AUTOMATIC BRAKE CONTROL SYSTEM	SUP									2	RISSB standards are subject to review at a period not exceeding five years from their date of publication.	SUP				
	20	4.1 General	SUP										Document History	HED				
	21	4.2 Air Braked Vehicles	SUP									1.2.4.1	1	Nil - first issue	SUP			
	22	4.3 Brake Control	SUP										Previous Published Versions	HED				
	23	5. BRAKE FORCE APPLICATION	SUP									1	This Standard replaces sections 6.5, Diagram 6-1, 13.3.2, 13.9.5.1, 13.9.5.2, 13.9.5.4, Diagrams 13-15 & 13-16, 24.2.1 and Diagrams 24-2.1 to 24-2.3 of the ROA Manual of Engineering Standards & Practices, published in 1992.	SUP				
	24	5.1 General	SUP										CONTENT	HED				
	25	5.2 Composition Brake Blocks	SUP									1.3						
	26	5.3 Abrasive Brake Blocks	SUP															
	27	5.4 Brake Discs	SUP															
	28	5.5 Net Braking Ratios - Automatic Brake	SUP															
	29	6. BRAKE SYSTEM COUPLINGS BETWEEN VEHICLES	SUP															
	30	6.1 General	SUP															
	31	6.2 Brake Pipe End Cocks	SUP															
	32	6.3 Other End Cocks	SUP															
	33	6.4 Coupling Hose Components	SUP															
	34	6.5 Vehicles Fitted with Couplers Incorporating Air Brake Connections	SUP															
	35	7. PARK BRAKE	SUP															
	36	7.1 General	SUP															
	37	7.2 Net Braking Ratios - Park Brake	SUP															
	38	8. MAINTENANCE	SUP															
	39	8.1 General	SUP															
	40	8.2 Function Checks - Servicing	SUP															
	41	9. VALIDATION OF BRAKING FUNCTION AND PERFORMANCE	SUP															
	42	9.1 General	SUP															
	43	9.2 Static Brake Test - Function and Performance	SUP															
	44	9.3 Braking Performance Type Test	SUP															
45	9.5 Single Car Test	SUP																


From track machine – to hi-rail vehicle – to trailers and trolleys

Trailer/Trolley Safety Checks

ire:	Trolley No		Date:
:- Daily on Check:	Complete	General Observations	
Check condition of framework. Check condition of floor decking. Check for loose, damaged or missing parts. Check for obvious signs of overloading. Check cleanliness and lubrication where applicable.			
:-			
Check the security and condition of the wheels.			
:-			
Check the security and condition of the trolley/trailer connections.			
:-			
Check the presence and condition of all safety labels and warning flashes. Check that trolley/trailer is within its maintenance date. Check availability of certification.			
Visually check condition of brake rigging. Check for correct operation of brake. Pull / Push test with brakes on – wheels must not rotate.			
<u>Downs –Faults</u>	<u>Actions (Fitter's Initials – Date)</u>		

Trailer/Trolley Safety Checks

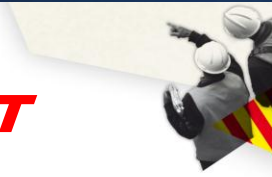
ire:	Trolley No		Date:
:- Weekly	Complete	General Observations	
<u>Condition Check:</u> Complete all Daily checks. Clean trailer/Trolley.			
Check tightness of axle nuts. Tighten where necessary (Do not over tighten).			
:-			
Check wheels for scoring, bruising, pitting or other damage. Replace wheels if there is any evidence of cracking or if flats exceed 25mm.			
Check and, if necessary, adjust the brake assembly. (Do not over tighten) Lubricate brake linkage.			
<u>Breakdowns –Faults</u>	1.4 <u>Actions (Fitter's Initials – Date)</u>		



Trolley braking –

Runaways in the UK and in Australia initiated change a number of years ago

URGENT SAFETY *ALERT*



BACKGROUND

A number of serious incident runaways both within Australia and internationally have occurred in recent years with the worst happening in the UK that resulted in the death of four track workers. The recommendations from this and other investigations highlight the need for rail plant and equipment to have suitable braking systems in place with the correct level of maintenance and inspection. During a recent inspection on a Laing O'Rourke possession it was identified that a loaded trolley was being used without any form of braking system.

CORRECTIVE/PREVENTATIVE ACTION REQUIRED

- The identified rail trolley was immediately put out of use.
- Project Managers are to ensure that trolleys without any form of braking system are to be immediately removed from service, tagged out of use and returned to the Select Depot.
- For trolleys that do not have an auto-braking system the project SWMS, Risk Assessments are to include the controls that are in place to prevent a runaway.
- Select are to source a suitable trolley to replace existing equipment.
- Select are to withdraw all trolleys that do not have an auto-brake system by Friday 12th September 2008.
- Maintenance is to be completed on trolleys that remain in service using the safety maintenance sheets attached.
- The Rail HSEQ Manager will update the Rail Risk register to include the use of trolleys on the network and required controls.



Controls to be applied to all types of rolling stock

Issued by Chief Engineers Division

Rolling Stock Technical Note

Safety Alert – Brake Requirements for Machinery and Support Frames

APPLICABLE TO ALL MACHINERY MOUNTED ON SUPPORT FRAMES OPERATING ON THE RAILCORP NETWORK

Due to runaway incidents in November 2012 and April 2013 involving machinery mounted on support frames (clipper and spike puller) there is a need to implement mandatory brake requirements for these types of machinery and their associated support frames.

The first incident involved a support frame running away while in the process of being assembled with the machinery, the second incident involved the machinery running away whilst balancing on the support frame and not in contact with the sleepers or ballast for restraint.

This requirement will be applicable to all types of machinery and their support frames, including but not limited to clippers and clip removers, drills and borers, grinders, spike drivers and pullers.

Due to the nature of these types of machinery, both in their operation and in their assembly, the requirements will be mandated specifically for machinery and their support frames and will be differentiated from similar vehicles such as conventional trolleys. However the braking requirements for these machinery and support frames will be similar to trolleys.

The braking performance requirements shall be as follows:

All new machinery and support frames, as of 10 May 2013, shall be required to have a fail safe brake fitted that will hold a fully loaded support frame indefinitely on a 1:30 grade. The brake system shall require a positive action to release and hold the brake in the released position. Once this positive action is released, the brake must reapply. This braking requirement shall be met with the support frame on rail alone and with machinery mounted. This braking system shall be regularly inspected, tested, and maintained in a fully operative condition.

Existing machinery and support frames with no brakes fitted will be permitted to continue operation for a period of 6 months however shall have revised operating procedures to minimise the risk of runaway.

After 6 months, from 10 November 2013, existing machinery and support frames will require modification to have a compliant braking system fitted in accordance with the performance requirements as detailed above.



(Fig. Left) Support frame assembled with machinery (Fig. Right) Support frame

Disclaimer

This document was prepared for use on the RailCorp Network only.

RailCorp makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems or work or operation. It is the document user's sole responsibility to ensure that the copy of the document it is viewing is the current version of the document as in use by RailCorp.

RailCorp accepts no liability whatsoever in relation to the use of this document by any party, and RailCorp excludes any liability which arises in any manner by the use of this document.

Copyright

The information in this document is protected by Copyright and no part of this document may be reproduced, altered, stored or transmitted by any person without the prior consent of RailCorp.

RTN 016

08/05/2013

Expires

Not applicable

Audience

- Machinery and Support Frame designers and manufacturers, operators and maintainers.

Main Points

- Machinery assembled to support frames to have a fail safe brake system fitted.
- Brake system to hold fully loaded support frame with machinery on a 1:30 grade indefinitely.
- Positive action to release brakes.
- Braking requirement to be met with support frames alone and support frames mounted with machinery.

Contact

Michael Uhlig
02 8922 1963
Jakub Zawada
02 8922 1996

Distribution

Open

Last Open Distribution
Nil

Prototype of a trolley braking system

Trolleys used to transport power packs and attachments. A problem when first put on track then when on track loaded



Braked trolley

With power pack attached



Summary of issues to address

A Standard Registration process to be developed

The Standard needs to contain essential items only not all encompassing

Standards need to reflect what is required for track machines not hand me downs

Need to look at terminology – Infrastructure Vehicles-Heavy Weight Rail Bound Vehicles (Tampers and Regulators), Hi-Rail Vehicles (Self Braking), Hi-Rail Vehicles (Road Wheel Braking) Trailers and Trolleys (Self Braking).

Industry needs to provide input to Standards development

Key issues such as brakes and wheels to be examined especially for hi-rails and trailers.

Consider what is already used by industry as well as new

Support initiatives with manufacturers / certifiers and engineers reports

Thank you
Any questions?

