

# **Civil Technical Maintenance Plan**

# ETP-00-03

Applicability					
ARTC Network Wide	SMS				
Publication Requirem	ent				

Internal / External

#### **Primary Source**

TMS 11 (v1.9) / ETE-00-03

#### **Document Status**

Version #	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
1.1	06 Jun 23	Standards	Stakeholders	Manager Track & Civil Standards	Head of Engineering Standards 08/06/2023

#### Amendment Record

Amendment Version #	Date Reviewed	Clause	Description of Amendment
1.0	19 Feb 23		Renumbered document from ETE-00-03. Ultrasonic inspection frequency change of the Telarah (194.920) to Kempsey (503.500) North Coast Line from 122 days to 182, minor reference amendments.
1.1	06 Jun 23		Update Ultrasonic inspection frequency for the East West Corridor.

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ETP-00-03

Introduction

1	Introd	duction3
	1. <b>1</b>	Overview
	1.2	Definitions4
	1.3	TMP, ARTC T&C CoP and Standards4
	1.4	Competency4
	1.5	Compliance5
	1.6	Dispensations issued by the CER
		1.6.1 Missed Inspections
		1.6.2 Increased latitude
2	Disus	ed and Seasonal Lines6
3	Tech	nical Maintenance Plan7
	3.1	General7
	3.2	Type of Inspection7
	3.3	Infrastructure Element7
	3.4	Description7
	3.5	Reference7
	3.6	Inspection Interval7
		3.6.1 Previous conversation from month-based intervals
	3.7	Conducted by

# 1 Introduction

#### 1.1 Overview

This document sets out the routine inspection policy for rail track and civil infrastructure in terms of mandatory inspection tasks and inspection intervals. The Technical Maintenance Plan (TMP) specifies:

- Which items are to be inspected
- What inspection tasks are to be carried out
- When inspection is required.

The inspection tasks and inspection intervals defined in this document are mandatory for all Australian Rail Track Corporation managed track.

Requirements for Structures are detailed in ARTC Track & Civil Code of Practice (T&C CoP) Section 9: Structures, ETG-09-01 and ETE-09-01.

This TMP details the minimum level of scheduled inspection. Additional inspection scope or increased frequencies may be authorised by local maintenance management in response to infrastructure condition or accelerated deterioration rates.

Any proposed reduction in routine inspection scope or increased inspection interval (lengthening time between inspections) must be authorised by way of an Engineering Waiver in accordance with ARTC Procedure *EGP-02-01 Engineering Waiver Management*.

## 1.2 **Definitions**

The following terms are used within this document:

TERM	DEFINITION
AMS	Asset Management System
CER	Civil Engineering Representative as per PEO-PR-008 Engineering, Design and Project Management Identification of Competence Procedure
COP	ARTC Track & Civil Code of Practice
Dispensation	Short-term occasional failure to comply with the requirements of an ARTC Standard for short periods on discrete sites, where there is a reason, supported by –
	Risk assessment
	Risk control measures
	Time bound action plan to return to compliance
Mainline	Includes all main operating lines, crossing loops, passing refuges, and sidings > 25km/h.
MGT	Million Gross Tonnes. The measure of the gross weight of train traffic carried by a section of track in one year.
P&C	Points and Crossing assemblies including turnouts, catchpoints, diamonds, slips, etc.
Passenger Line	Any line that carry scheduled passenger trains with services capable of 1000 passengers per day, excluding special heritage train services.
TMP	The ARTC Track and Civil Technical Maintenance Plan
Track Inspector	A person with required competencies to undertake routine Patrol, General, and Detailed inspections (see 1.4). The term does not relate to any specific organisational position.
URFD	Ultrasonic Rail Flaw Detection, a form of non-destructive testing of rail.
Yard	A collection of sidings at a common location.

### 1.3 TMP, ARTC T&C CoP and Standards

The TMP references ARTC Engineering Standards and the ARTC T&C CoP. In their current form some of these documents contain task inspection intervals. Where the interval detailed in the TMP differ from those mentioned in ARTC standards and the ARTC T&C CoP, the TMP interval shall apply.

#### 1.4 **Competency**

Persons carrying out track patrol, front of train, general, or detailed inspections shall hold the required competencies listed in the ARTC Track and Civil Competency Matrix .

Other specialist competencies may be required, e.g. URFD, to perform specialised inspections.

The above competencies are part of the National Competencies for the Transport and Logistics Industry and are published by the Australian National Training Authority.



Introduction

#### 1.5 Compliance

An inspection is early if it is completed outside the latitude before the due time.

An inspection is late if it is completed outside the latitude after the due date.

Inspections are to be set and progressed from original due date, not date completed. If an inspection is not completed within the maximum interval time frame it is deemed not complying with this TMP.

#### **Dispensations issued by the CER** 1.6

Dispensations may be issued by the CER for both missed inspections and increase latitude on inspections as per 1.6.1 and 1.6.2. Where a dispensation is applied the following requirements shall be met.

- 1. A dispensation may not be issued without a time bound action plan to return to compliance
- 2. Dispensations shall be entered into the AMS

#### 1.6.1 **Missed Inspections**

This clause is to be used to manage short term dispensation for limited types of missed inspections where there is a justifiable reason for the inability to achieve inspection, such as equipment breakdown, infrastructure unavailability or access issues that cannot be reasonability accommodated.

This dispensation can only be granted by the CER and only for the following inspection types;

- 1. Track Patrol Inspection
- 2. Front of Train Inspection
- 3. Rail Detailed Ultrasonic Inspection
- 4. General Inspection of Points and Crossings
- 5. Detailed Geometry and Rail Wear Inspection

This dispensation shall not be used to manage systematic non- compliance and may only be issued for a single missed interval of an inspection without approval of the General Manager Technical Standards.

#### 1.6.2 **Increased latitude**

The CER may issue a dispensation to increase the latitude of an inspection up to 50% for any inspection type subject, provided

- The previous inspection was not missed
- There is an action plan to maintain compliance for subsequent inspections.

ETP-00-03

**Disused and Seasonal Lines** 

# 2 Disused and Seasonal Lines

The TMP detailed in Section 3 applies to operational lines. On lines that have had rail transport services withdrawn temporarily or indefinitely the rail infrastructure does not have to be maintained except where there is a legal duty of care to landowners or the public. Where a line is withdrawn from use temporarily (e.g. seasonal line), suitable arrangements need to be in place to prevent access to that line if inspections are deferred, and arrangements put in place to inspect/repair the line prior to it being returned to use.

Statutory requirements may exist with respect to fire hazard reduction, noxious weeds and vermin, and waterway management. Public safety risks may need to be mitigated e.g. at level crossings, urban fencing etc. as well as risks to landowners from embankment collapse or erosion.

ARTC standard *ETE-00-04 Infrastructure Inspections for Non-Operational Lines* provides more detailed guidance on the inspection and management of non-operational railways.



Technical Maintenance Plan

## 3 Technical Maintenance Plan

#### 3.1 General

The Civil Technical Maintenance Plan is divided into sections reflecting the Code of Practice sections from which the routine scheduled inspection requirements are derived.

The TMP has the following elements:

- Type of inspection
- Infrastructure Element
- Brief description of the inspection to be performed
- Applicable ARTC Standard or Manual to be used and Ellipse Standard Job reference
- Inspection intervals and latitudes
- Who conducts the inspection.

#### 3.2 **Type of Inspection**

This column identifies the type of inspection: Patrol; General; or Detailed, and the focus of the inspection.

#### 3.3 Infrastructure Element

This column identifies the component, system, or aspect of the track assets to which the inspection applies.

#### 3.4 **Description**

This column provides a more detailed scope of each inspection.

#### 3.5 Reference

This column references the applicable ARTC Standard as well as the Ellipse Standard Job reference applicable to the inspection tasks.

#### 3.6 Inspection Interval

Where more than one interval may be seen to apply for the same type of inspection and infrastructure element on the same corridor segment/track usage/track configuration, the shortest inspection interval is to apply.

Suppression sequencing is used to allow aligning MSTs for asset that have minor inspections with shorter frequency and detailed inspection usually with a longer frequency. For example, the 3 monthly general inspection of turnouts is set at 91 days and as is suppressed when the detailed is due, therefore the detailed is set at 364 days (4 x 91).

Where appropriate, latitude is provided to accommodate scheduling or unforeseen events. Latitudes are generally expressed as a % of the specified inspection interval. ARTC provides a guideline for calculating latitudes as shown in Table: 3.1 Latitudes. Unless specified the latitudes apply for each specified inspection interval. For each item of infrastructure element, the latitude is to be determined at the time of determining the inspection interval.

ETP-00-03

Technical Maintenance Plan

#### Table: 3.1 Latitudes

Inspection Interval	Latitude
≤ 42 days	± 20%
≥ 43 days	± 10%

#### 3.6.1 Previous conversation from month-based intervals

For the purposes of the TMP, the following conversion from months/years have been applied.

1 Month	30 Days
3 Months	91 Days
4 Months	122 Days
6 Months	182 Days
12 Months	365 Days (Normal)
12 Months	364 Days (Suppression)
24 Months	730 Days (Normal)
24 Months	728 Days (Suppression)
36 Months	1095 Days
48 Months	1461 Days
60 Months	1826 Days

Suppression sequencing allows aligning MSTs for assets that have minor inspections with shorter frequency and detailed inspection usually with a longer frequency. For example, the 3 monthly general inspection of turnouts is set at 91 days and as is suppressed when the detailed is due, therefore the detailed needs to be set at 364 days (4 x 91).

This will allow easier alignment of service schedules over time and prevent scope slippage.

### 3.7 Conducted by

This column specifies who or what performs the inspection. Nominated persons e.g. Track Inspector refers to persons holding the required competencies to perform the inspection and not to any organisational position. See section 1.4.

Type of Inspection	Infrastructure Element	Element Description	Refer	ence	Ellips	e Std Job		Applicability	Inspection Interval	Latitude (±)	Conducted by
			Standard /Manual	Section/C lause	Number	Description	State	Corridor Segment/Track Usage/Track Configuration			
Section 0 -	Track System										
Equipment wi	th EGI 'TR0001 Tra	ack – Running Line'.									
Scheduled Track Patrol Inspection	All elements	Track Patrol – Includes: Purpose, general requirements, requirements when performing different types of patrol and scope.	ETE-00-02	Sect 3	TP0001	Scheduled Track Patrol	SA, WA, VIC	All Running Lines	7 Days	20%	Track Inspector
(By Road/Rail vehicle or by walking. When patrol is by Engine Patrol, ETE-00-02 clause 3.4 applies.)	Rails and Joints	Includes: Rail; Welds (welded joints); Mechanical and Insulated Joints (non-welded joints); Rail Wear; Surface damage; Lubrication.	CoP Sect 1: Rail	1.4.1.1 1.4.2.1 1.4.3.1 1.4.4.1 1.4.5.1 1.4.6.1			NSW, QLD	Concrete Sleepered Passenger Lines or Mainline > 10 MGT/year plus adjacent Loops, Refuges & Crossovers.	7 Days	20%	
	Sleepers & Fastenings	Includes: Sleepers, Turnout Bearers, and Bridge Transoms; Timber, Steel, Composite and Concrete; Resilient and Non-Resilient Fastenings.	CoP Sect 2: Sleepers & Fastenings	2.3.2 a)				Timber or Steel Sleepered Passenger Lines or Mainline with >10 MGT/year plus adjacent Loops, Refuges & Crossovers	2 Patrols / 7 days	Max 3 days between Patrols	
	Points and Crossing arrangements	Includes: Turnouts; Catchpoints; Diamonds; Slips; Expansion Switches; etc.	CoP Sect 3: Points & Crossings	3.3.1				Running Lines that carry Freight Only with 1 MGT/yr to 10 MGT/yr, also Lower Hunter lines on Kooragang Is and Port Waratah where >10MGT, but train speed is <=25 km/h as well as adjacent Loops, Refuges & Crossovers	7 Days	20%	
	Ballast	Includes: Ballast type, condition, and profile.	CoP Sect 4: Ballast	4.3.1 a)							
	Track Geometry	Includes: Top, Twist, Superelevation, Line and Gauge.	CoP Sect 5: Track Geometry	5.4.1.1				Running Lines that carry Freight Only with< 1 MGT/yr also Lower Hunter lines on Kooragang, Morandoo and Bullock Islands where <10MGT, but train speed is <=25 km/h as well as adjacent Loops, Refuges & Crossovers	14 Days	20%	
	Track Lateral Stability	Includes: Track buckling and other conditions that may affect track lateral stability	CoP Sect 6: Track Lateral Stability	6.4.1.1							
	Clearances	Includes: Clearances to structures, track centres, diverging tracks and obstructions.	CoP Sect 7: Clearances	7.3.1 a)							
	Earthworks	Includes: Cuttings, Embankments and geotechnical or earthworks instability special locations.	CoP Sect 8: Earthworks	8.3.2 a)							
	Structures	Includes: Underbridges; Overbridges; Tunnels; Timber, Steel, Concrete, and Masonry.	CoP Sect 9: Structures ETE-09-01	9.4 Sect. 2.4							
	Drainage	Includes: Waterways, Culverts, Cess, top and Toe Drains	CoP Sect 10: Flooding	10.3.2 a)	-						
	Signage	Includes: Permanent Speed Boards; Temporary Speed Boards; Safety signs.	CoP Sect 11: Railway Operating Signs	11.2.1 a)							
	Line of Sight	SA, VIC & WA only Includes: Track Operating Signage, Fixed Signals and Point Indicators.	CoP Sect 15: Line of Sight	15.4.1 a)							

#### **Civil Technical Maintenance Plan**

### ETP-00-03

Type of Inspection	Infrastructure Element	Element Description	Reference		Ellipse Std Job		Applicability		Inspection Interval	Latitude (±)	Conducted by
	Level crossings	Includes: Public, Private, and Service crossings; Passive or Active.	CoP Sect 16: Level Crossings	16.4.1 a)							
	Right of Way	Includes: Fencing; Noxious Weeds and Animals; Vegetation; Fire Hazard; Access roads; Fire Breaks.	CoP Sect 17: Right of Way	17.3.1							
Equipment wi	th EGI 'TR0002 Tra	ack - Siding' or 'TR0004 Track - Yard'.									
Scheduled Track Patrol Inspection	Yards and Sidings Includes all elements as for Running Lines	Includes sidings ≤25km/h maximum speed, Scope includes all aspects as for Running Lines.	All Relevant CoP Sections	Relevant clauses	TP0005	Track Patrol – Yards and Sidings	All ARTC	Partial or fully timber sleepered siding (Walking)	730 Days	10%	Track Inspector
			ETE-00-02	E-00-02 Sect 4.1				Fully concrete or steel sleepered sidings (not necessarily walking	1826 Days	10%	
Equipment wi	th EGI 'TR0001 Tra	ack – Running Line'									
Scheduled Front of Train Inspection	Rail Lubrication	Includes: Wheel/Rail noise; Carry of lubricant along the rail; Over or under lubrication; Ballast contamination.	CoP Sect 1: Rail ETE-00-02	1.4.4 Sect 4.1	FOT001	Front of Train Insp.	SA, WA, VIC	Lines with Track Speed > 50km/h	182 Days	10%	Track Inspector
	Joints: Mechanical and Glued Insulated	Includes: Noise from impact or loose components; Horizontal and vertical geometry.	CoP Sect 1: Rail ETE-00-02	1.4.2 Sect 4.1	-		NSW, QLD		91 Days	10%	
	Track Geometry	Includes: Short and long wavelength Top and Line, and Twist.	CoP Sect 5: Track Geometry ETE-00-02	5.4 Sect 4.1							
	Signage	Includes: Sighting distance and clarity of temporary and permanent speed signs and other safety signs.	CoP Sect 11: Railway Operating Signs CoP Sect 15: Line of Sight ETE-00-02	Sect 4.1	-						
	Right of Way	Includes: Fencing, access roads, vegetation, noxious weeds.	CoP Sect 17: Right of Way ETE-00-02	Sect 4.1	-						
	Level Crossings	Includes: Sighting distance, track geometry.	CoP Sect 16: Level Crossings ETE-00-02	Sect 4.1							

#### **Civil Technical Maintenance Plan**

### ETP-00-03

Type of Inspection	Infrastructure Element	Element Description	Reference		Ellipse Std Job		Applicability		Inspection Interval	Latitude (±)	Conducted by
Section 1 - I	Rail										
Equipment wit	th EGI 'TR0001 Tra	ack – Running Line', 'TR0003 Track – Crossov	er' or 'TR000	5 Track – Lo	oops'.						
Scheduled Rail Detailed Ultrasonic	Rail – internal head & web	Continuous ultrasonic inspection or Manual hand-held inspection where continuous inspection is ineffective.	CoP Sect 1: Rail	1.4.7	RAIL01	Det. Insp. of Rail – Ultrasonic Car	AII ARTC	Where not otherwise specified below, the frequency will be in accordance with the CoP requiring a test at least every 15 MGT.			Ultrasonic Rail Flaw Detection
Inspection			ETE-01-02 ETE-01-03		Use RAIL1A for 31-day interval		NSW Hunter Valley Heavy Haul	Up Coal - Scholey St (164.806) to Hexham (173.286) & Hexham to Maitland (192.832), Up Main - Maitland (192.832) to Muswellbrook (289.010), Up Relief Roads - Farley to Greta, Branxton to Whittingham & Camberwell to Mt Owen. Hanbury Jct Up Nth Kooragang Is Down Branchs	31 Days	20%	Vehicle or Manual handheld URFD by qualified person
								Down Main - Greta (210.150) to Whittingham Jct (234.441), Up Branch - Whittingham to Mt Thorley & Mt Thorley Balloon Loop.	61 Days	10%	
								Down Coal - Kooragang Is Jct (170.000) to Maitland (192.832), Down Main - Maitland (192.832) to Greta (210.150), Hexham Down Refuge Loops No1 to No5, Muswellbrook (288.936) to Ulan (435.525)	84 Days	10%	
								Pelton line (Maitland to ARTC limit) & Telarah to Farley Triangle Loop, Muswellbrook (289.010) to Werris Creek (410.711), Werris Creek (410.711) to Narrabri Coal (548.485). Up Main - Woodville Jct TfNSW I/F (163.920) to Maitland (192.773; 414pts via Plat 3), Down Main - Woodville Jct TfNSW I/F (163.920) to Maitland (192.773; 410pts via Plat 4), Maitland (192.301) to Telarah (194.920) North Coast line, Down Relief - Woodville Jct TfNSW I/F (163.920) to Islington Jct (164.457), Down - Hamilton Jct TfNSW I/F (164.045) to Islington Jct (164.409), Up - Hamilton Jct TfNSW I/F (164.045) to Islington Jct (164.408), Down Main - Whittingham Jct (234.441) to Muswellbrook (288.936), Down Coal - Scholey St (164.804 ) to Kooragang Is Jct (170.000), Hanbury Jct Down Nth & Sth Forks to 170.104, Kooragang Is Up & then A & B Holding Roads 170.104 to 173.700 then Whittingham to Mt Thorley Down Branch & Newdell Jct to Newdell (ARTC limit),	122 Days	10%	
								Werris Creek (410.711) to CRN I/F (411.201) Armidale line.	182 Days	10%	
								Kooragang Is No1 to No4 Arrival Roads to Dump Stations at 177.131, Port Waratah Coal Arrival (No. 1,2&3), Arrival No. 1, Storage (No.1&2) Roads	365 Days	10%	

#### **Civil Technical Maintenance Plan**

### ETP-00-03

Type of Inspection	Infrastructure Element	Element Description	Refer	Reference		Ellipse Std Job		Applicability		Latitude (±)	Conducted by
							NSW Hunter Valley Central & North West	Narrabri Coal (548.485) to Moree (665.800), Narrabri Jct (564.718) to Narrabri West Jct (564.799) Walgett line, Narrabri North Triangle (565.274 to 565.351), Binnaway (458.235) to The Gap (599.974), Gulgong CRN I/F (340.270) to Binnaway CRN I/F (459.204), Ulan (435.525) to Gulgong (460.114), Dubbo (461.577) to Merrygoen (562.320), Troy Jct (466.020) to CRN I/F (466.224) Coonamble line, Dubbo CRN I/F (460.890) to Narromine CRN I/F (497.790) Main West.	365 Days	10%	
								Moree (665.800) to Camurra West CRN I/F (679.040), Camurra (677.027) to North Star Stop Block (760.570).	1461 Days	10%	
							NSW Interstate Network	Macarthur (57.965) to Albury NSW/VIC Border (648.433) Main South, Joppa jct (230.496) to CRN I/F (230.610) Canberra line, Junee (485.921) to CRN I/F (486.021) Griffith line, The Rock (550.960) to CRN I/F (551.075) Boree Creek line, Port Botany (9.941) to Marrickville (16.472) Botany line, Marrickville (6.371) to Flemington (18.909) Metropolitan Goods, Chullora Jct North Fork (17.246 to 17.596), Chullora Jct (17.083) to Macarthur (58.092) SFN.	122 Days	10%	
								Telarah (194.920) to Kempsey (503.500) North Coast line, Kempsey (503.500) to Acacia Ridge (971.136) North Coast line, Unanderra (91.080) to Moss Vale (150.600), Moss Vale North Fork (150.116 to 150.500).	182 Days	10%	
								Goobang Jct (447.521) to Narromine (556.912), Goobang Nth (449.502) to Goobang West (454.442) North West Link, Goobang West NWL East Fork (452.937 to 454.134), Goobang Jct CRN I/F (446.950) to Broken Hill (1126.640), Stockinbingal (454.729) to Goobang Jct (628.340), Cootamundra (428.224) to Stockinbingal CRN I/F (454.906) Lake Cargelligo line, Cootamundra South Fork (428.332 to 428.808) KMs via S70	365 Days	10%	
							VIC	Seymour (99.809) to Wodonga (302.620) West Track.	122 Days	10%	
							Network	Moonee Ponds (2.056) to Tottenham Jct (10.181) Main, Sims St Jct (4.090) to Tottenham Jct (10.181) Local, Tottenham Jct (10.181) to Craigeburn (30.285) Single VIC NE line, Tullamarine Passing Lane.	182 Days	10%	
								Craigeburn (30.285) to Seymour (99.809) Single VIC NE, Passing Lanes – Donnybrook, Kilmore East & Tallarook, Seymour (99.809) to Albury VIC/NSW Border (302.835) East Track, Benalla (194.970) to Oaklands I/F B'dry (320.880) Oaklands line, Tottenham Jct (17.242) to Wolseley VIC/SA Border (463.610) VIC South line, Tottenham Triangle West Leg (10.080 to 10.633) KMs via VIC NE Maroona (232.094) to I/F B'dry (405.312) Portland line.	365 Days	10%	
							SA & WA Interstate Network	Mile End (0.000) to Dry Creek (7.540), Mile End (3.400) to SA/VIC Border Wolseley (313.290), Tarcoola (505.610) to SA/WA Border (1050.965), WA/SA Border (1050.965) to Kalgoorlie (1780.600), Tarcoola (503.327) to API B'dry (510.850).	365 Days	10%	

#### **Civil Technical Maintenance Plan**

### ETP-00-03

Type of Inspection	Infrastructure Element	Element Description	Reference	Ellip	se Std Job	Applicability		
							Dry Creek (7.540) to Crystal Brook Spencer Jct (95.294) to Tarcoola ( Spencer Jct (95.294) to I/F B'dry ( Coonamia (0.000) to Broken Hill (3 Coonamia (0.000) to Spencer Jct (	
							Dry Creek (0.000) to Outer Harbou	
						All ARTC	Crossovers that are connected to t (Tonnage known)	
							Crossovers that are connected to t (Tonnage unknown)	
						Crossing loops/Refug	ges: (where operating speed is 25kph	
						All NSW	Crossing Loops NSW.	
						SA, WA, VIC	Crossing Loops Vic, SA and WA.	

## Equipment with EGI 'TR0001 Track – Running Line', 'TR0003 Track – Crossover' or 'TR0005 Track – Loops'.

Scheduled Detailed Rail Wear Inspection	Rail Head	Measurement of rail head profile: Height & width wear dimensions.	CoP Sect 1: Rail	1.4.3	GEOM01	Det. Geometry and Rail Wear Insp. – Geometry Car	All ARTC	All lines inspected by GEOM01
					RAIL02	General Insp. of	All ARTC	All Main Lines
						Rail Wear		All Heavy Haul Lines
						Used for lines not covered by GEOM01	NSW, QLD, SA, VIC	Crossing Loops, Crossovers
							WA	
Analysis of Rail Wear data	Rail Head	Engineering review of Rail Head measurements recorded by the AK car to confirm areas of Rail Wear and create Defects/Work Orders for Site Inspection	CoP Sect 1: Rail	1.4.10.1	RAIL09	Rail Wear Data Analysis and Defect/Work Order Creation	All ARTC	All Main Lines and loops in each L Rail Wear Measurement and take WA Loop frequency variations
Scheduled General Visual Inspection for rail or weld discontinuities and surface conditions	Continuously Welded Rail and welds	Includes condition of all rail surfaces and welds.	CoP Sect 1: Rail	1.4.1.2	RAIL03	Gen. Rail and Welded Joint Insp.	All ARTC	All Main Lines with continuously w Crossing Loops, Crossovers

### Equipment with EGI 'TR0001 Track – Running Line', 'TR0002 Track – Siding', 'TR0003 Track – Crossover' or 'TR0005 Track – Loops'.

Scheduled General Non- Welded Joint InspectionRail ends and joint componentsIncludes rail ends, fishplates, bolts, excessive joint gaps, frozen joints and pumping joint conditions.CoP Sect 1: Rail1.4.2.2RAIL04Gen. Non-Welded Joint Insp.All ARTCAll tracks with loose jointed or loop for loopScheduled Detailed Inspection of Insulated JointsIncludes rail ends, fishplates, bolts, insulating material, metal flow over end posts, sleepers, ballast and pumping conditions.CoP Sect 1: Rail1.4.6.JJ0001Det. Insp. of Insulated JointsAll ARTCAll tracks with loose jointed or loop spection of Insulated JointsScheduled Detailed Inspection of Insulated JointsIncludes rail ends, fishplates, bolts, insulating material, metal flow over end posts, sleepers, ballast and pumping conditions.CoP Sect 1: Rail1.4.6.JJ0001Det. Insp. of Insulated JointsAll ARTCAll tracks with associated equip points									
Scheduled Detailed Insulated JointsIncludes rail ends, fishplates, bolts, insulating material, metal flow over end posts, sleepers, ballast and pumping JointsCoP Sect 1: Rail1.4.6IJ0001Det. Insp. of Insulated JointsAll ARTCAll tracks with associated equip Metal flow over end posts, sleepers, ballast and pumping	Scheduled General Non- Welded Joint Inspection	Rail ends and joint components	Includes rail ends, fishplates, bolts, excessive joint gaps, frozen joints and pumping joint conditions.	CoP Sect 1: Rail	1.4.2.2	RAIL04	Gen. Non-Welded Joint Insp.	All ARTC	All tracks with loose jointed or long
	Scheduled Detailed Inspection of Insulated Joints	Insulated Joints	Includes rail ends, fishplates, bolts, insulating material, metal flow over end posts, sleepers, ballast and pumping conditions.	CoP Sect 1: Rail	1.4.6	IJ0001	Det. Insp. of Insulated Joints	All ARTC	All tracks with associated equipme

Equipment with EGI 'TR0001 Track – Running Line' or 'TR0005 Track – Loops' with specified conditions only.

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

	Inspection Interval	Latitude (±)	Conducted by
< (197.240), (505.610). 163.500) Whyalla line 392.200), (95.294).	547 Days	10%	
ur (14.928).	730 Days	10%	
tracks that are tested.	At a frequency traffic over cros	of 15MGT ssover.	
tracks that are tested.	365 days	10%	
h or less, loops are not tested	)		
	Twice the time specified for ac mainline	period Ijacent	
	1826 Days	10%	
	As per frequen GEOM01 in Se CTMP Table	cy of ection 5 of	Track Geometry Recording Vehicle
	365 Days	10%	Track
	182 Days	10%	Inspector
	Twice the time specified for ac mainline	period djacent	
	365 Days	10%	
ogical PC to align with the account of Heavy Haul and	365 Days	10%	Rail Engineer
elded rail (CWR)	365 Days	10%	Track
	Twice the time specified for ac mainline	period Ijacent	Inspector
g welded rail (LWR)	730 Days	10%	Track Inspector
ent items 'Insulated Joint'.	365 Days	10%	Track Inspector

Type of Inspection	Infrastructure Element	Element Description	Refer	ence	Ellips	e Std Job		Applicability
General Inspection of Corrosion in Wet Locations - Tunnels	Rail foot & web as well as fastenings	Includes: Rail & fastening corrosion in Tunnels and other wet locations.	CoP Sect 1: Rail	1.4.3.3	RAIL05	Gen. Insp. of Corrosion in Wet Locations	All ARTC	Only on Running Lines through tu where rails are continuously wet.
General Inspection of Rail Lubrication	Rail contact surfaces	Includes carry of lubrication, excessive surface contamination or side wear and lubricators functioning.	CoP Sect 1: Rail	1.4.4.2	RAIL06	Gen. Insp. of Rail Lubrication	All ARTC	All Running Lines where rail lubric
General Inspection of Guard Rail Condition	Guard rails	All guard rails.	CoP Sect 1: Rail	1.4.5.2	RAIL08	Gen. Insp. of Guard Rail Condition	All ARTC	Only on Running Lines where Gu on Bridges.

### Equipment with EGI 'RLUB01 Rail Lubricator - Simple' or 'RLUB02 Rail Lubricator - Complex'.

General Inspection of Rail Lubrication Devices	Rail Lubricators	Includes blade height & condition, plunger settings & operation, damage to other components and leakage	CoP Sect 1: Rail	1.4.4.2	RLUB01	Gen. Insp. of Rail Lubrication Devices	All ARTC	

### Section 2 - Sleepers and Fastenings

#### Equipment with EGI 'TR0001 Track – Running Line', 'TR0002 Track – Siding', 'TR0003 Track – Crossover', 'TO0004 Catch Point – Siding' or 'TR0005 Track – Loops'.

General Inspection of Sleeper & Fastening Condition	Sleepers & Fastenings	Includes: Sleeper, Turnout Bearer, and Bridge Transom integrity and effectiveness; Timber, Steel, and Concrete materials; Resilient and Non-Resilient Fastenings.	CoP Sect 2: Sleepers & Fastenings ETG-02-01 (SA, WA, VIC)	2.3.2 b) c) & 2.7.4	TIE001	Gen. Insp. of Sleepers and Fastenings	All ARTC	Partial or fully timber sleepered run inspection) Fully concrete or steel sleepered r walking inspection) Partial or fully timber sleepered sid Fully concrete or steel sleepered s walking inspection)
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## Section 3 – Points and Crossings

Equipment wi	th EGI 'TO0001 Tu	rnout – Running Line', 'TO0002 Turnout – Sidi	ing', 'TO0003	8 Catch Poir	nt – Running L	ine', 'TO0004 Cat	ch Point – Siding	', 'TO0005 Diamond – Running Line' or 'TO0006	Diamond – S	iding'.	
Detailed Inspection of Points and Crossings	Includes all Turnouts, Catchpoints, Diamonds, Slips etc. on all Running lines	A detailed inspection includes measurement and visual condition assessments for: Condition of Switch and Stock rail, Crossing and Check rail assemblies, closure rails, fastenings, bolts, chocks, heel blocks. Wear on switch and stock rails, crossing	CoP Sect 3: Points & Crossings	3.3.3 & 3.3.4	TURN01	Det. Insp. of Points & Crossings	All ARTC	P&C ≥ 5MGT	364 Days	10%	Track Inspector
	& Sidings.	noses, and wing rails. Bearer condition and effectiveness. Ballast condition and effectiveness. Track Geometry including; top, line, twist, and gauge; as well as switch tips, clearances, flangeways, and check rail effectiveness.	ETE-03-01					P&C < 5MGT.	728 Days	10%	
General Inspection of Points and Crossings	Includes all Turnouts, Catchpoints, Diamonds, Slips etc. on all Running lines & Sidings	A general inspection includes all the visual condition assessments of the detailed P&C inspection however measurements are only taken where the Inspectors has deemed they are required.	CoP Sect 3: Points & Crossings	3.3.2	TURN02	Gen. Insp. of Points & Crossings	All ARTC	$P\&C \ge 5MGT$ and also: 1) on timber or concrete bearers with >30MGT, or 2) on curves <800m radius, or 3) with heeled switches (pivot heels) on timber bearers, or 4) on timber bearers with non-resilient (dogspike) fasteners.	91 Days	10%	Track Inspector
								P&C ≥ 5MGT not included in 1), 2), 3), or 4), above	182 Days	10%	
			ETE-03-01					P&C < 5MGT.	364 Days	10%	

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

Inspection Interval	Latitude (±)	Conducted by
365 Days	10%	Track Inspector
182 Days	10%	Track Inspector
365 Days	10%	Track Inspector
365 Days	10%	Track Inspector
365 Days	10%	Track Inspector
730 Days	10%	
730 Days	10%	
1826 Days	10%	
	Inspection365 Days182 Days365 Days365 Days365 Days365 Days730 Days730 Days1826 Days	Inspection (±)365 Days10%182 Days10%365 Days10%365 Days10%365 Days10%365 Days10%365 Days10%10010%10010%730 Days10%1826 Days10%

Type of Inspection	Infrastructure Element	Element Description	Refer	ence	Ellipse	e Std Job		Applicability
							Hunter Valley	Inspection frequency as per ETN-
								Reliability based inspections deter
								Inspection period may be no great above. Where ETN-00-03 does no

### Equipment with EGI 'TO0001 Turnout – Running Line', 'TO0003 Catch Point – Running Line' or 'TO0005 Diamond – Running Line'.

Scheduled Rail Detailed Ultrasonic Inspection	Points and Crossings Steel Components - Internal Head & Web	Continuous ultrasonic inspection or Manual hand-held inspection where continuous inspection is ineffective. (For untestable areas refer to ETE-01-03, Sect 3.3)	CoP Sect 1: Rail ETE-01-02 ETE-01-03	1.4.1.3	TURN03 TURN04	Det. P&C Rails Insp Ultrasonic Car Det. P&C Rail Insp Man. Ultrasonic Test	All ARTC	As for Section 1 Rail; Standard Jo (Ref: ETE-01-03 'Non-Destructive 3.1.1) To apply for locations where conr 1. It is not practical to schedule w 2. Areas which can be tested are equipment (as it may need to lift p
		Bolt Hole Crack Limits	ETI-01-02 (All ARTC)					
		Management of Rail Defects	ETG-01-02 (SA WA VIC)					
		Rail Defect Standard	ETM-01-04 (NSW QLD)					

## Section 4 - Ballast

#### Equipment with EGI 'TR0001 Track – Running Line' or 'TR0005 Track – Loops'.

General Inspection of Ballast	Ballast	Includes: Assessment of ballast profile, excessive fouling resulting in mud holes or wet spots. Indications of poor sleeper support by ballast resulting in excessive track vibration or pumping. Other ballast defects affecting track support and stability.	CoP Sect 4: Ballast ETH-10-01: Mud Hole Management Guideline	4.3.1 b) 4.2 & 5.2.2	BALL01	Gen. Insp. of Ballast	All ARTC	The General Inspection of Ballast occur as close as possible to, eve General Inspection of Track Stabi Locations of fouled ballast identifie entered into Ellipse as known con managed in accordance with ETH orders.
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# Section 5 – Track geometry

Equipment wi	ith EGI 'TR0001 Tra	ack – Running Line' or 'TR0005 Track – Loops	· .					
Detailed Track Geometry Inspection	Track Geometry	Includes: Top, Twist, Line, Variation from design superelevation and Gauge.	CoP Sect 5: Track Geometry	5.4.1.4 & Table 5-16	GEOM01	Det. Geometry and Rail Wear Insp Recording Car	All ARTC Hunter Valley	Main lines: Up & Down Coals - Scholey St (16
								Up & Down Mains - Woodville Jct Muswellbrook (289.010), Down Relief - Woodville Jct TfNSV Jct (164.457), Up & Down - Hamilton Jct TfNSW Jct (164.409), Up Relief Roads - Farley to Greta, Camberwell to Mt Owen, Hexham Up Relief, Drayton Down Maitland (192.301) to Telarah (19- Muswellbrook (288.936) to Ulan (4 Muswellbrook (289.010) to Werris Werris Creek (410.711) to Turraw. Werris Creek (410.711) to CRN I/I

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

	Inspection Interval	Latitude (±)	Conducted by
00-03.			
mined from ETE-00-05.			
er than double the frequency t state a frequency, the stand	that would other ard frequency sh	wise apply nall apply.	
b; RAIL01 'Det. Insp. of Rail - Testing Of Rail (for Internal & ecting tracks are ultrasonically th the Ultrasonic Car. nissed by the rail mounted co robes to avoid damage) for ex	Ultrasonic Car' Surface Defects / tested but; ntinuous ultrasor ample housed p	s)', Section nic testing oints	Ultrasonic Rail Flaw Detection Vehicle or Manual hand held URFD by qualified person
should be scheduled to n in conjunction with, the ity. id as Mud Holes are to be ditions and thence -10-01 using Ad Hoc work	365 Days	10%	Track Inspector
			Track geometry recording vehicle or equivalent.
64.804) to Maitland	122 Days	10%	
TfNSW I/F (163.920) to			
V I/F (163.920) to Islington			
I/F (164.045) to Islington			
Branxton to Whittingham &			
Relief, 4.920) North Coast line, 135.525), Creek (410.711), an (547.600), <sup>7</sup> (411.201) Armidale line.			

Type of Inspection	Infrastructure Element	Element Description	Refere	ence	Ellipse	Ellipse Std Job		Applicability	Inspection Interval	Latitude (±)	Conducted by
							Hunter Valley Central & North West	Turrawan (547.600) to Moree (665.800), Dubbo CRN I/F (460.890) to Dubbo 107 Pts (462.460).	122 Days	10%	
								Ulan (435.525) to Gulgong (460.114), Gulgong (340.174) to Merrygoen (418.500), Dubbo (461.577) to Merrygoen (562.320), Dubbo 107 Pts (462.460) to Narromine CRN I/F (497.790) Main West.	182 Days	10%	
								Moree (665.800) to Camurra West CRN I/F (679.040), Camurra (677.027) to North Star Stop Block (760.570), Narrabri Jct (564.718) to Narrabri West Jct (564.799) Walgett line, Narrabri North Triangle (565.274 to 565.351), Troy Jct (466.020) to CRN I/F (466.224) Coonamble line, Merrygoen (418.500) to Binnaway (459.220), Binnaway (458.235) to The Gap (599.974).	365 Days	10%	
							Interstate Network	Telarah (194.920) to Acacia Ridge (971.136) North Coast line, Port Botany (9.941) to Marrickville (16.472) Botany line, Marrickville (6.371) to Flemington (18.909) Metropolitan Goods, Chullora Jct North Fork (17.246 to 17.596), Chullora Jct (17.083) to Macarthur (58.092) SFN, Macarthur (57.965) to Albury NSW/VIC Border (648.433) Main South, Joppa jct (230.496) to CRN I/F (230.610) Canberra line, Unanderra (91.080) to Moss Vale (150.600), Moss Vale North Fork (150.116 to 150.500). Seymour (99.809) to Albury VIC/NSW Border (302.835) East Track, Seymour (99.809) to Wodonga (302.620) West Track, Craigeburn (30.285) to Seymour (99.809) Single VIC NE, Passing Lanes – Donnybrook, Kilmore East, Tallarook, & Tullamarine, Tottenham Jct (10.181) to Craigeburn (30.285) Single VIC NE line, Tottenham Triangle West Leg (10.080 to 10.633) KMs via VIC NE, Moonee Ponds (2.056) to Tottenham Jct (10.181) Main, Sims St Jct (4.090) to Tottenham Jct (10.181) Main, Sims St Jct (4.090) to Tottenham Jct (10.181) Main, Sims St Jct (4.000) to SA/VIC Border Wolseley (313.290), Mile End (3.400) to SA/VIC Border Wolseley (313.290), Mile End (0.000) to Crystal Brook (197.240), Coonamia (0.000) to Spencer Jct (95.294), Spencer Jct (95.294) to Tarcoola (505.610), Tarcoola (505.610) to SA/WA Border (1050.965), WA/SA Border (1050.965) to Kalgoorlie (1780.600), Tarcoola (503.327) to API B'dry (163.500) Whyalla line.	122 Days	10%	
								Goobang Jct (447.521) to Narromine (556.912), Goobang Nth (449.502) to Goobang West (454.442) North West Link, Goobang West NWL East Fork (452.937 to 454.134), Goobang Jct CRN I/F (446.950) to Broken Hill (1126.640), Stockinbingal (454.729) to Goobang Jct (628.340), Cootamundra (428.224) to Stockinbingal CRN I/F (454.906) Lake Cargelligo line, Cootamundra South Fork (428.332 to 428.808) KMs via S70, Junee (485.921) to CRN I/F (486.021) Griffith line.	182 Days	10%	

#### **Civil Technical Maintenance Plan**

### ETP-00-03

Type of Inspection	Infrastructure Element Description		Refer	ence	Ellipse	e Std Job		Applicability
							Crossing loops: (whe NSW & VIC	The Rock (550.960) to CRN I/F ( Bogan Gate (483.280) to CRN I/F Dry Creek (0.000) to Outer Harbo Benalla (194.970) to Oaklands I/F line, Maroona (232.094) to I/F B'dry (4 re operating speed is 25kph or less NSW (except Goobang Jct to Bro Goobang Jct), VIC (only where adjacent to XPT
							WA	
							SA, NSW & VIC	NSW (Goobang Jct to Broken Hil Goobang Jct), VIC (where XPT doesn't operate)

### Section 6 – Track stability

#### Equipment with EGI 'TR0001 Track – Running Line' or 'TR0005 Track – Loops'.

Track Stability General Inspection	Track Stability	Includes: Sleepers & fastenings, ballast and rail adjustment for tracks with both welded and non-welded rail.	CoP Sect 6: Track Lateral Stability ETM-06-08 ETM-06-09	6.4.2.2 & 6.4.3	TSMP01	Gen. Insp. of Track Stability	All ARTC	The General Inspection of Track S scheduled to occur as temperature cold season, normally the end of A possible to, even in conjunction w of Ballast.
Pre & Post High Temperature Season Reviews of the TSMP	Desk Top Review	Review TSMP to ensure preparedness for high temperatures prior to the HTS and then to ensure lessons learnt are captured post HTS.	ETM-06-08	3.4	TSMP03 TSMP02	TSMP- Pre-High Temp Season Review TSMP- Post High	-	Should be scheduled prior to the e identified stability issues enough t the start of high temperature seas Should be scheduled to be conclu
						Temp Season Review		

## Section 7 - Clearances

Equipment with EGI 'TR0001 Track – Running Line', 'TR0002 Track – Siding' or 'TR0005 Track – Loops'.

Scheduled General Clearances Inspections	Clearance between the track and adjacent structures or tracks and the clearance/fouling point of diverging tracks.	Includes: Measurement of clearance to structures within structure gauge, platforms and other approved permanent infringements to the Maintenance Intervention standard, track centres and clearance points. Note: May be undertaken manually or via electronic method	CoP Sect 7: Clearances	7.3.1 b) & c) 7.2.12 7.2.13 7.2.14 Appendix E	CLEAR1 CLEAR2 CLEAR4	Gen. Insp. of Track Centre Clearances Gen. Insp. of Structure Clearances Gen. Insp. of Clearance Points	All ARTC	All Running Lines carrying > 10 M Passenger Lines.
			ETG-07-01: (SA, WA, VIC)		CLEAR3	Gen. Insp. of Approved Perm. Infringements		
					CLEAR1 CLEAR2 CLEAR4	Gen. Insp. of Track Centre Clearances Gen. Insp. of Structure Clearances Gen. Insp. of Clearance Points		Running Lines carrying < 10 MG <sup>-</sup> Lines or Sidings > 25 km/h.

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

	Inspection Interval	Latitude (±)	Conducted by
51.075) Boree Creek line, (486.050) Tottenham line, ur (14.928), B'dry (320.880) Oaklands 05.312) Portland line.	365 Days	10%	
loops are not tested)			
ken Hill & Cootamundra to	Twice the time specified for ac mainline	period ljacent	
	365 Days	10%	
& Cootamundra to	730 Days	10%	
Stability should be es start to increase after the August, and as close as ith, the General Inspection	365 Days	10%	Track Inspector
end of September to enable ime to be attended to before on. ded prior to the end of April.	365 Days	10%	Area Manager and all relevant Track Inspectors
IGT or	365 Days	10%	Track Inspector or Track geometry recording vehicle or equivalent
	182 Days	10%	
that are not Passenger	730 Days	10%	

Type of Inspection	Infrastructure Element	Element Description	Refer	ence	Ellipse Std Job		Applicability
					CLEAR3	Gen. Insp. of Approved Perm. Infringements	
					CLEAR5 CLEAR2 CLEAR4	Gen. Insp. of Track Centre Clearances Gen. Insp. of Structure Clearances Gen. Insp. of Clearance Points	Sidings ≤ 25 km/h.
					CLEAR3	Gen. Insp. of Approved Perm. Infringements	

### Section 8 - Earthworks

## Equipment with EGI 'RW0001 Right of Way'.

General Inspection of Earthworks - Embankments and Cuttings	Earthworks - Embankments and Cuttings	Includes: Indications of recent movement including slippage, slumping, settlement or heaving. Fissures and cracks in formation or earth batters. Rock, earth, or other debris falling on or near the track. Track subsidence due to ground movements. Earthwork scour and/or erosion including undercutting of the toe of embankments and cuttings. Water seepage from embankments and cuttings. Damage to embankments or cuttings or evidence of conditions that may cause future slip, scour, slump, settlement or otherwise likely to impact on the stability of earthworks.	CoP Sect 8: Earthworks	8.3.2 b)	ROW001	Gen. Insp. of Earthworks – Embankment/Cut.	All ARTC	All	365 Days	10%	Track Inspector
General Inspection of Earthworks - Geotechnical Sites	Geotechnical Special Locations	Includes: Geotechnical special location sites nominated as being vulnerable to earthworks instability.			ROW002	Gen. Insp. of Earthworks - Geotech Sites			365 Days	10%	
General Inspection of Geotechnical Site EWS Function	Geotechnical Special Locations Early Warning System	Includes: Geotechnical early warning system monitoring devices (slip detectors etc.) where installed.			ROW003	Gen. Insp. of Geotech. Site EWS Function			30 Days	20%	

### Section 10 - Flooding

## Equipment with EGI 'RW0001 Right of Way', 'DGSCU1 Small Culvert/Pipe (Under Track)', 'DGSCU2 Small Culvert/Pipe (Off Track)' or 'DGSYS1 Drainage System'.

General Inspection of Waterways and	All Drainage that is "Group Maintained"	Includes: Waterways, Surface drains such as Cess, Top and Toe drains, all track cess drainage pipes with an opening less than 500mm.	CoP Sect 10: Flooding	10.3.2 b)	ROW004	Gen. Insp. of Waterways and Drains	All ARTC	All	365 Days	10%	Track Inspector
Drains for Flooding including	ROW001, DGSCU1 & DGSSCU2	Applied as a general inspection on the ROW001 only.									
General Inspection of	Drainage DGSYS1	For drainage systems possibly with pumps and sumps etc in yards typically	RTS 3432 (NSW, QLD)		SUBDR1	Gen. Insp. of Sub- Surface Drainage			365 Days	10%	Track Inspector
Sub Surface Drainage											

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

Inspection Interval	Latitude (±)	Conducted by
365 Days	10%	
1461 Days	10%	
730 Days	10%	

Type of Inspection	Infrastructure Element	Element Description	Reference	Ellipse Std Job	Applicability
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## Section 11 – Railway operating signs

### Equipment with EGI 'TR0001 Track – Running Line' or 'TR0005 Track – Loops'.

General Inspection of Trackside Railway Operating Signs	Railway operating signs	Includes: Permanent and temporary signs, warning signs including whistle and advance warning signs, change of operations systems or operational parameters.	CoP Sect 11: Railway Operating Signs	11.2.1 b)	SIGN01	Gen. Insp. of Trackside Signs	AII ARTC	All

#### Section 12 – Level crossings

#### Equipment with EGI 'LX0301 or LX0302 or LX0303 or LX0304 or LX0305 or LX0306 or LX0307 or LX0308 or LX0309 or LX0310 or LX0311 or LX0312 or LX0313 or LX0314 or LX0314

Visual Check for Crossing	Level Crossings	Includes: All Active Level Crossings	ESW-26-01	S03011	S03011	Level Crossing Test	VIC	All Active Level Crossings
Operation							SA, WA	All Active Level Crossings *Level crossings assessed with sul 7 day inspection as per ESD-03-01

#### Equipment with EGI 'LCING1, LCING2, LCING3, LCING4, LCING5 Level Crossing'.

General Inspection of Level Crossing	Level Crossings	Includes: Public, Private and Service Level Crossings, Pedestrian level crossings	ETS-12-01 ETS-12-00	12.4 Part 4	LXNG01	Gen. Insp. of Level Crossing	All ARTC	All highway, main road, and major crossings on: All Running Lines carrying > 10 M All pedestrian crossings
								All other level crossings

### Section 17 – Right of Way

#### Equipment with EGI 'RW0001 Right of Way'.

General Inspection of RoW - Fences, Vegetation, Access Roads	Right of Way - Fences, Vegetation, Access Roads	Includes: Damaged or defective fencing, unsafe condition of access facilities. Treated or controlled areas including ballast, cesses and firebreaks not substantially free from vegetation growth. High risk fire locations. Evidence of unauthorised encroachment onto the ROW.	CoP Sect 17: Right of Way	CoP Sect 17: 17.3.2 tight of Way	ROW005	Gen. Insp. of Right of Way	All ARTC	All
General Inspection of Redundant Infrastructure	Redundant assets	Includes: Infrastructure no longer utilised to carry traffic which is still located within the rail corridor that pose a third-party safety risk. Assets covered by ETE-09-01 must be inspected discretely as per ETE-09-01			ROW006	Gen. Insp. of Redundant Infrastructure		

#### **Civil Technical Maintenance Plan**

#### ETP-00-03

	Inspection Interval	Latitude (±)	Conducted by	
	1095 Days	10%	Track Inspector	
5'				
	7 Days	20%	Track Inspector	
Ifficient battery capacity for	3 / 7* Days	20%		
arterial road level	365 Days	10%	Track Inspector	
	730 Days	10%		
	365 Days	10%	Track Inspector	
	730 Days	10%		