AUSTRALIAN RAIL TRACK CORPORATION LTD

**Discipline: Engineering** **Category: Procedure**

# Performance Measures for Track and Civil Infrastructure

## ETP-00-02

### Applicability

| | | | |
|---|---|---|---|
| **ARTC Network Wide** | ✓ | **CRIA (NSW CRN)** | |

### Document Status

| Version | Date Reviewed | Prepared by | Reviewed by | Endorsed | Approved |
|---|---|---|---|---|---|
| 1.0 | 4 November 2010 | Standards | Manager Standards | Exec Manager SS&P | Special Risk & Safety Committee 1/11/2010 |

### Amendment Record

| Version | Date Reviewed | Clause | Description of Amendment |
|---|---|---|---|
| 1.0 | 4 November 2010 | | First issue including amendments following Risk & Safety Committee conditional approval. Renumbered as ETP-00-01 already in use. |

### Document Distribution List

| Copy # | Position Title | Location |
|---|---|---|
| N/A | N/A | ARTC Intranet |

# Contents

# 1 Introduction

## 1.1 Purpose

To specify the performance measures for track and civil infrastructures to ensure that the infrastructure is in a condition to meet ARTC's business requirements.

## 1.2 Background

ARTC monitors the condition of infrastructure to meet train operational requirements as defined in the Corporate Plan.

A wide range of reports provide governance over track and civil infrastructure condition and integrity and demonstrate compliance with the ARTC Civil Technical Maintenance Plan (TMS 11) and where applicable the ARTC CoP. These reports are regularly reviewed by senior management.

Assets are reviewed by type to determine which measures are to be used for long term asset management. These measures indicate whether the infrastructure condition is deteriorating or improving so that future renewals may be predicted. The measures may be State specific.

## 1.3 Scope

This procedure specifies the performance measures for trending track and civil infrastructure condition for network wide application.

## 1.4 Procedure Owner

The Manager Standards is the procedure owner and is the initial point of contact for all queries relating to this procedure.

## 1.5 Responsibilities

The Manager Standards, as Procedure Owner, is responsible for the preparation of and any subsequent variations to this procedure.

The Manager Network Performance and Infrastructure Managers are responsible for implementing, managing and reporting on the requirements contained in this procedure.

## 1.6 Reference Documents

The following documents support this procedure:

- The ARTC Corporate Plan Key Performance Indicator Quarterly Report;
- NSW and Victoria Lease Annual Condition reports;
- The ARTC Corporate Plan;
- Corridor Network Performance Reports;
- PP–163 Speed Restriction Management;
- ARTC Track and Civil Code of Practice.
- TMS 11 Civil Technical Maintenance Plan (TMP's)

## 1.7 Definitions

The following terms are used within this document:

| Term | Description |
|---|---|
| Key Performance Indicator | Key Performance Indicators are quantifiable measurements, agreed to beforehand, that reflect the critical success factors of an organization. |
| Trending data | Measure of condition/performance against time. |
| Lead Indicator | A lead indicator is a measurable parameter, which will help to predict the occurrence of some related critical problems or events. |
| Lag Indicator | Lag indicators confirm long-term trends, but they do not predict them. |
| Broken rail | A broken rail is defined as forming two separate pieces (ie clean break or piece broken out). It includes breaks in switches and welds. It does not include breakaways, broken plates or small sections of rail <100mm in length eg shelling or foot damage. |
| A mud hole | A section of track where water drainage appears to be less than 2 mm per hour |

# 2 Performance measures

Performance measures including trending data for track and civil infrastructure are developed to monitor asset condition.

The measures show the asset component, (e.g. rail sleepers etc) or asset attribute (e.g. track geometry or smoothness) to be monitored. They show the performance, degradation, deterioration and where appropriate the lead indicators for those conditions. They also show conformance with the asset inspection regime and asset repair activities.

The performance measures and KPI targets are reviewed annually by the ARTC Executive.

**Table 1 – Performance measures**

| ARTC T&C CoP Section and description | KPI | Trending data | Lead/Lag Indicator | Analysed by | Performance measure | Recipient | Comment |
|---|---|---|---|---|---|---|---|
| **0 Track system** | | | | | | | |
| Time lost due to TSR's | ✓ | | Lag | Network Performance | Minutes delay | CEO, COO, GM's and Infrastructure Managers | Track and civil only |
| Inspections | | ✓ | Lag for management Lead for field | Infrastructure Managers | % of safety critical inspections carried out within specified latitude | GM's and Infrastructure Managers | As specified in TMP |
| Total inspections | | ✓ | Lag for management Lead for field | Infrastructure Managers | % of total inspections carried out within specified latitude | GM's and Infrastructure Managers | As specified in TMP |
| Overdue defects | | ✓ | Lag for management Lead for field | Infrastructure Managers | % of overdue defects not repaired within time | GM's and Infrastructure Managers | |
| **1 Rails** | | | | | | | |
| Broken rails | ✓ | | Lag | Network Performance | Number of broken rails per 100 track km. | Infrastructure Managers | As specified in ETE-01-01 and ETE-01-03 |
| New rail defects/track km and total defects | | ✓ | Lead | Network Performance | Total defects per test km and total number of defects | CEO, COO, GM's and Corridors | Includes rail surface condition |
| Worn rail | | ✓ | Lead | Infrastructure Managers | Metres of rail exceeding the Reporting Limit | GM's and Infrastructure Managers | As determined by profiles from AK car. Reporting limits as defined in the proposed ARTC T&C CoP |
| Surface roughness | | ✓ | Lead | Network Performance | Number of impacts exceeding threshold per line section | GM's and Infrastructure Managers | Monitor impacts from AK car. |
| **2 Sleepers** | | | | | | | |
| Timber sleepered track | | | | Infrastructure Managers | Report by exception | GM's and Infrastructure Managers | TSRs applied as specified in ARTC T&C CoP Section 2.3.3 |

| ARTC T&C CoP Section and description | KPI | Trending data | Lead/Lag Indicator | Analysed by | Performance measure | Recipient | Comment |
|---|---|---|---|---|---|---|---|
| **3 Points and crossings** | | | | | | | |
| TSR's in turnouts | | ✓ | Lag | Infrastructure Managers | Number of TSRs in turnouts per line section | GM's and Infrastructure Managers | Number of turnouts with defects A5 or worse as specified in ARTC T&C CoP Section 2.3.3 Table 3.9 |
| **4 Ballast** | | | | | | | |
| Loss of profile | | ✓ | Lag for management Lead for field | Infrastructure Managers | Metres of track | GM's and Infrastructure Managers | Metres with defects A5 or worse as specified in ARTC T&C CoP Section 2.3.3 Table 4.6 |
| Mud holes | | ✓ | Lead for field | Infrastructure Managers | Metres of track with mud holes | GM's and Infrastructure Managers | |
| **5 Track geometry** | | | | | | | |
| TQI | ✓ | | Lag | Network Performance | The % track where TQI is worse than 25 | ARTC Board, CEO, COO, GM's and Corridors | Corporate KPI |
| Track geometry parameters | | ✓ | Lead | Network performance | Measures for top, twist, line and gauge | CEO, COO, GM's and Infrastructure Managers | As measured by AK car |
| Geometry defects | | ✓ | Lag for management Lead for field | Infrastructure Managers | Number of defects per 100 track km. | GM's and Infrastructure Managers | Number of track geometry defects in the E1/E2 range s specified in the ARTC T&C CoP Table 5.6 |
| **6 Track stability** | | | | | | | |
| Lateral stability | | ✓ | Lag | Infrastructure Managers | Number of buckles per track section | GM's and Infrastructure Managers | |

| ARTC T&C CoP Section and description | KPI | Trending data | Lead/Lag Indicator | Analysed by | Performance measure | Recipient | Comment |
|---|---|---|---|---|---|---|---|
| **7 Clearances**<br>**8 Earthworks**<br>**10 Flooding**<br>**16 Grade Crossings**<br>**17 Right of Way** | | ✓ | Lag | Infrastructure Managers | Monitored by inspection, IAW ARTC CoP and TCR's by exception | GM's and Infrastructure Managers | Refer to section 0 of this table for trending of inspections carried out within specified time and overdue defects not repaired on time. |
| **9 Structures**<br>**11 Railway Signs**<br>**12 Access Control**<br>**13 Fire Prevention & Control**<br>**14 Electrical Infrastructure**<br>**15 Line of Sight** | | | | | | | **None of these Sections are applicable to this Procedure** |