Metrolinx Maintenance Plan: Product Description

MX-SEA-PD-128

Revision 00

Date: May 2023

Maintenance Plan: Product Description

MX-SEA-PD-128

Publication Date: May 2023

Amendment Record

Revision	Date (DD/MM/YYYY)	Description of changes

Preface

This is the first edition of the Metrolinx Maintenance Plan Product Description (MX-SEA-PD-128). It forms part of a suite of guidance documents that describe the procedures to be followed to comply with Metrolinx's Reliability, Availability, Maintainability and Safety (RAMS) requirements.

The purpose of this document is to describe what the Maintenance Plan is and how it defines the impact a proposed change has on the maintenance of the railway system and details how this change shall be implemented. Project proponents may need to apply the process when they are undertaking a technical change to the railway system or modifying a maintenance regime or undertaking an operational change to the railway system.

Suggestions for revision or improvements can be sent to the Metrolinx Systems Engineering Assurance office at Engineering.Assurance@metrolinx.com. The Director of the Systems Engineering Assurance office authorizes the changes. Include a description of the proposed change, background of the application and any other useful rationale or justification. Be sure to include your name, company affiliation (if applicable), e-mail address, and phone number.

May 2023

Contents

Documents ..... **iv**

Acronyms and Abbreviations ..... **v**

Definitions ..... **vi**

1 Maintenance Plan **1**

1.1 Purpose 1
1.2 Applicability 1
1.3 Supporting Material 1
1.4 Products 1
1.5 Key Responsibilities 1
1.6 Competence 2
1.7 Structure 2
1.8 Contents 2
1.9 Quality Criteria 3
1.10 Document Management 3

Tables

Table 1 Supporting Documents iv

Table 2 Acronyms and Abbreviations v

Table 3 Definitions vi

Table 4: Document Phases 4

Documents

Table 1 Supporting Documents

Document Number	Document Title	Relation
BS EN 50126-1:2017	Railway Applications – The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) Part 1: Generic RAMS Process	Parent Standard
ISO 9001:2015	Quality management systems — Requirements	Supporting Standard
MX-SEA-STD-100	RAMS Process Standard	Related Standard
MX-SEA-GDC-128	Maintenance Plan Guidance	Guidance
MX-SEA-TPL-128	Maintenance Plan Template	Template
MX-SEA-PD-144	Maintenance Procedure Product Description	Product Description
MXSD-SSA-L1-STD-0001	Railway Risk Assessment Standard	Supporting Standard
MX-SEA-TOR-001	Metrolinx System Review Panel (SRP) Terms of Reference (ToR)	Review Panel ToR
April 5, 2023	Metrolinx Safety Certification Committee (SSC) Terms of Reference (ToR)	Certification Committee ToR

Acronyms and Abbreviations

Table 2 Acronyms and Abbreviations

Abbreviation	Full Name
CTC	Consent To Construct
CTO	Consent To Operate
FRACAS	Failure Reporting Analysis and Corrective Action System
ISA	Independent Safety Assessor
PDD	Process Description Document
PFD	Process Flow Diagram
RACI	Responsible, Accountable, Consulted and Informed
RAM	Reliability, Availability and Maintainability
RAMS	Reliability Availability Maintainability and Safety
SCC	Safety Certification Committee
SRP	System Review Panel
ToR	Terms of Reference

Definitions

Table 3 Definitions

Term	Definition	Source
Asset Owner	Groups and individuals that are responsible for asset ownership, asset maintenance, inventory management, document control, asset handover and reliability engineering	MX-ALM-STD-001
Availability	Ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided.	BS EN 50126:2017
Maintainability	Ability to be retained in, or restored to, a state to perform as required, under given conditions of use and maintenance.	BS EN 50126:2017
Project Company	The private sector entity which enters into the Project Agreement with Infrastructure Ontario and Lands Corporation and Metrolinx to design, build and where applicable, finance, operate or maintain a Project. The special-purpose entity which has entered into a Project Agreement with the Contracting Authority.	CKH-QMA-FRM-003
Project Management	Appointed by Metrolinx as its representative and is responsible for the delivery of the Project within the prescribed Schedule and budget. Metrolinx employees fulfilling the role of the Project Manager may also be considered the Cost Centre Manager, if this person is also delegated signing authority in accordance with the Metrolinx Corporate Administrative Manual, Administrative Management, Approval Authorization Controls and Designations. It is noted that non-Metrolinx employees fulfilling the role of the Project Manager are not considered Cost Centre Managers. In such cases refer to	CKH-QMA-FRM-003

	approved Project Chart of Accounts for the Program for the designated Cost Centre Manager.	
Reliability	Ability to perform as required, without failure, for a given time interval, under given conditions.	BS EN 50126:2017
Subsystem	Part of a system, which is itself a system	BS EN 50126:2017
System	Set of interrelated elements considered in a defined context as a whole and separated from their environment	BS EN 50126:2017

1 Maintenance Plan

1.1 Purpose

1.1.1 The Maintenance Plan defines the impact the proposed change has on the maintenance of the railway system and details how this change shall be implemented.

1.2 Applicability

1.2.1 This product is mandatory for any project that undertakes a technical change to the railway system (i.e., introduction of a new subsystem, renewal of an existing subsystem, a modification to an existing subsystem, or introduction of a new or modified maintenance regime) or undertakes an operational change to the railway system.

1.2.2 This product is not applicable for established routine maintenance activities including like-for-like replacement of components.

1.2.3 This product is considered good practice when developing or modifying any complex system.

1.3 Supporting Material

1.3.1 The Maintenance Plan shall be documented in the Maintenance Plan template is located in MX-SEA-TPL-128.

1.3.2 Guidance on completing the Maintenance Plan is located in MX-SEA-GDC-128.

1.4 Products

1.4.1 The Maintenance Plan is a product of the System Assurance process. Guidance on this process is available via MX-SEA-STD-100

1.5 Key Responsibilities

1.5.1 The Project Company is responsible for the production of the Maintenance Plan. Preparation of the Maintenance Plan may be delegated; however, the Project Company is responsible for its content and quality. The RACI does not specify that the stakeholders mentioned below need to hold any specific competences outside their job role.

1.5.2 The Project Company is the organization responsible for the contracted scope of work at the time of development Project Engineer is the individual that is responsible for the design at the time of development.

1.5.3 The System Review Panel (SRP) has delegated authority from the Safety Certification Committee (SCC) and is responsible for endorsing the Maintenance Plan. The System Review Panel ensures that the Maintenance Plan is compliant with the project requirements, applicable legislation, and national, industry, and Metrolinx standards. The SRP may also

identify uncertainties, issues, and assumptions that may arise as the project progresses that should be addressed.

1.5.4 The Project Management may be performed by Metrolinx or may be contracted, for example in a Design/Build, whereby Metrolinx Project Management would ensure contract provisions for the Maintenance Plan are met and would not develop the Maintenance Plan.

1.5.5 Some of the Asset Owner obligations and responsibilities may be transferred through contracting, whereby the contract contains Reliability, Availability and Maintainability (RAM) and operating requirements. The Metrolinx Asset Owner would participate in endorsing the Maintenance Plan whereas a contracted party responsible for RAM would develop the Maintenance Plan as directed by the Project Management.

1.5.6 The full Responsible, Accountable, Consulted, and Informed (RACI) information that sets out the interaction between all stakeholders involved in the production and endorsement of the Maintenance Plan is available in MX-SEA-STD-100.

1.6 Competence

1.6.1 All personnel responsible for the Maintenance Plan shall have knowledge of safety management and railway maintenance. Additional support may be needed from personnel with expertise of maintenance in the area of the project company.

1.7 Structure

1.7.1 The Structure of the Maintenance Plan is described in the Maintenance Plan Guidance document located in MX-SEA-GDC-128.

1.7.2 The document requires the following section titles:

a) Introduction and Background

b) Project Scope

c) Maintenance Impact

d) Maintenance Strategy

e) Readiness Schedule

1.8 Contents

1.8.1 The contents of the Maintenance Plan are described in the Maintenance Plan Guidance document located in MX-SEA-GDC-128.

1.8.2 As a minimum, it shall contain the following:

a) the maintenance impact of the project;

b) the actions taken to implement those changes;

c) the plan to complete those actions;

d) safety requirements or SRACs that the maintenance plan addresses; and

e) deliverables

1.8.3 The maintenance strategy shall include:

a) maintenance planning assumptions;
b) deliverables;
c) preventative maintenance activities;
d) corrective maintenance activities; and
e) equipment monitoring and diagnostic activities.

1.8.4 Each maintenance activity shall include:

a) a description of the activity, including method and process;
b) any required existing or new procedures;
c) safety requirements or SRACs that the maintenance activity addresses;
d) special equipment;
e) required personnel;
f) materials;
g) maintenance environment;
h) required training;
i) required documentation and records;
j) logistical considerations;
k) human factors considerations;

1.8.5 Any update to the Maintenance Plan shall include the status of the implementation at the different Phase(s).

1.9 Quality Criteria

1.9.1 The Maintenance Plan shall have sufficient detail to understand the changes to maintenance required by the project and the plan for implementing those changes at the correct stage. It shall set a clear plan for all actors responsible for maintenance activities.

1.9.2 The quality management system used shall conform to ISO 9001:2015 rules or equivalent rules accepted by the Metrolinx Project Delivery Team and be appropriate for the system under consideration.

1.10 Document Management

1.10.1 The Maintenance Plan is produced at Phase 5 (Architecture and Apportionment) and reviewed through Phase 10 (acceptance). The Maintenance Plan is a requirement for System Design Safety (SDS) gate progression.

1.10.2 Table 4 provides an overview of the Maintenance Plan document phases.

Document	Phase
Maintenance Plan	5 – Architecture and Apportionment of Design Requirements

TABLE 4: DOCUMENT PHASES