Metrolinx Commissioning Plan: Product Description

MX-SEA-PD-130

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Date: April 2023

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Amendment Record

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

Preface

This is the first edition of the Metrolinx Commissioning Plan Product Description (MX-SEA-PD-130). 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 the Plan that defines the actions required for the commissioning of the change to the railway system and details how the actions 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.

April 2023

Contents

Tables

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) (PHASE 1: Adoption of European Standard EN 50126-1:2017)	Parent Standard
ISO 9001:2015	Quality management systems — Requirements	Supporting Standard
MX-SEA-STD-100	RAMS Process Standard	Related Standard
MXSD-SSA-L1-STD-0001	Railway Risk Assessment Standard	Supporting Standard
MX-SEA-STD-005	RAM Verification& Validation Process	Related Standard
TBD	Safety Validation Plan PD	Related Document
MX-SEA-PD-123	RAM Validation Plan PD	Related Document
MX-SEA-GDC-130	Commissioning Plan Guidance	Guidance
MX-SEA-TPL-130	Commissioning Plan Template	Template
MX-SEA-PD-145	Commissioning Procedure Product Description	Product Description
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
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

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 Manager	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 approved Project Chart of Accounts for the Program for the designated Cost Centre Manager.	CKH-QMA-FRM-003

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 Commissioning Plan

1.1 Purpose

1.1.1 The Commissioning Plan defines the actions required for the commissioning of the change to the railway system and details how the actions shall be implemented.

1.1.2 Commissioning is the testing to demonstrate that the change functions as intended and is contractually required when introduced into the environment for operation. This also includes the demonstration that the existing systems which interface with the change continue to function as intended after implementation of the change.

1.1.3 Commissioning is the final set of activities to complete verification and validation of the system requirements before acceptance. The commissioning plan must ensure that sufficient credible evidence is produced to allow for the system to be accepted.

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.

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

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

1.3 Supporting Materials

1.3.1 The Commissioning Plan shall be documented in the Commissioning Plan template located in MX-SEA-TPL-130.

1.3.2 Guidance on completing the Commissioning Plan is located in MX-SEA-GDC-130.

1.3.3 The RAM V&V Process is documented in MX-SEA-STD-005.

1.4 Products

1.4.1 The Commissioning Plan is a product of the System Assurance process. Guidance on this process, including the review, approval and acceptance of products, is available via MX-SEA-STD-100.

1.5 Key Responsibilities

1.5.1 The Project Company is responsible for the production of the Commissioning Plan. Preparation of the Commissioning Plan may be delegated; however, the Project Company is responsible for its content and quality.

1.5.2 The System Review Panel (SRP) has delegated authority from the Safety Certification Committee (SCC) and is responsible for endorsing the Commissioning Plan. The System Review Panel ensures that the Commissioning 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.

1.5.3 The Project Company is the organization that is responsible for the contracted scope of work at the time of development.

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 Reliability, Availability, Maintainability and Safety (RAMS) Test Specification are met and would not develop the Commissioning Plan.

1.5.5 Some of the Asset Owner obligations and responsibilities may be transferred through contracting, whereby the contract contains RAM and operating requirements. The Metrolinx Asset Owner would participate in endorsing the Commissioning Plan whereas a contracted party responsible for RAM would develop the Commissioning 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 Commissioning Plan is available in MX-SEA-STD-100.

1.6 Competence

1.6.1 The Commissioning Plan shall be completed by personnel with knowledge of safety management and railway commissioning.

1.7 Structure

1.7.1 The Structure of the Commissioning Plan is described in the Commissioning Plan Guidance document located in MX-SEA-GDC-130.

1.7.2 The document requires the following section titles:

a) Introduction;

b) Project Scope; and

c) Testing and Commissioning Plan.

1.8 Contents

1.8.1 The contents of the Commissioning Plan are described in the Commissioning Plan Guidance document located in MX-SEA-GDC-130.

1.8.2 As a minimum, it shall contain the following:

a) Summary describing the overall commissioning strategy, phases, scope of activities, affected systems and interfaces, and reviews.

b) Commissioning Requirements including contractual obligations, required permits, notices, stakeholder or independent witness points, independent assessments and sign-off

c) List of Stakeholders and a Stakeholder management plan including responsible individuals, roles, authority and communications plan

d) List of commissioning tasks including

1) Description of each task

2) Rationale for each activity including:

i. The goal of the activity

ii. Any safety and RAM requirements being verified or validated during a commissioning activity is listed in the rationale to ensure traceability

3) Pass/Fail Criteria

4) System configuration during test, analysis and inspection activities, test conditions, type of test

5) A reference to, or description of, any procedures and test specifications that will govern the task

6) Equipment, space/infrastructure, facilities or other external resources required

7) Personnel including witnesses or other external resources

8) A complete, logic-tied schedule for all tasks

e) Risks associated with any commissioning activities

f) Health and Safety Requirements during commissioning activities

g) Identification of any commissioning activities that confirm key safety functionalities and therefore must be prerequisites of other activities

h) A problem resolution policy including required documentation, roles & responsibilities, troubleshooting protocols, and contingency plans for activities that have a high likelihood of occurrence or a severe consequence

i) Description of all required documentation to support and record commissioning results (e.g. test specifications, test records, inspection records, reports, list of witness signatures, standards, regulations, design documents etc.)

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

1.9 Quality Criteria

1.9.1 The Commissioning Plan shall have sufficient detail for the audience to understand the actions required by the project company to commission the contracted project, and detail of who is responsible for completing those actions at the correct stage. It shall set a clear plan for all actors responsible for commissioning 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 Commissioning Plan is produced at Phase 5 (Architecture and Apportionment) and reviewed as needed through Phase 10 (Acceptance). The Commissioning Plan is a requirement for System Design Safety (SDS) gate progression.

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

Document	Phase
Commissioning Plan	5 – Architecture and Apportionment of System Requirements

TABLE 4: DOCUMENT PHASES