

MO-002 — Reproducible Test Environments and Test Execution

[Go to C.1 Mission Objectives](#)

MO-002 identifies the mission-level objective for [Reproducible Test Environments](#) and [Test Execution](#).

The objective contains two independently verifiable outcomes and therefore serves as a non-leaf parent requirement.

Contents

- [MO-002a — Reproducible Test Environments](#)
- [MO-002b — Reproducible Test Execution](#)

Source

This Mission Objective consolidates mission-level intent from the draft [DIDO-TE](#) Requirements Register and the Broad Agency Announcement material concerning:

- Realistic and controllable [Test Environments](#)
- Deterministic Test Environment states
- Repeatable testing scenarios
- Consistent [Test Execution](#)
- Automated scenario execution
- Recording inputs supplied to [Nodes](#)
- Playing recorded inputs back to [Nodes](#)
- Coordinating playback across a [Node Set](#)
- Preserving Test Environment [Configurations](#)
- Preserving [Test Definitions](#)
- Preserving [Test Argument Values](#)
- Preserving [Test Run](#) context
- Comparing repeated [Test Results](#)

The Broad Agency Announcement material states the following objective:

Create repeatable testing scenarios, including regression testing, that allow rigorous evaluation of distributed systems under different conditions and configurations.

The source material also identifies:

- Deterministic states
- State consistency
- Predictable outcomes
- Scenario automation

- Repeatable and consistent execution
- Recorded input playback
- Coordinated playback across Nodes

The draft Requirements Register provides the controlling source requirement identifiers. The applicable identifiers require confirmation from a readable copy of the register before inclusion on the derived leaf pages.

Decomposition

The source mission-level intent combines two independently verifiable outcomes:

- Reproduction of a selected [Test Environment](#)
- Repetition of selected [Test Execution](#)

MO-002 decomposes into:

- MO-002a, which addresses reproduction of a selected Test Environment
- MO-002b, which addresses repetition of selected Test Execution and evaluation of the resulting [Test Results](#)

The decomposition permits [DIDO-TE](#) to satisfy one derived requirement while independently passing or failing the other.

MO-002a addresses whether DIDO-TE can recreate the applicable conditions, [Configurations](#), [Resources](#), [Nodes](#), [Node Sets](#), [Deployment Targets](#), [Execution Facilities](#), and [Dependencies](#) that constitute a selected Test Environment.

MO-002b addresses whether DIDO-TE can repeat selected Test Execution under defined conditions and produce Test Results within the permitted variation established by the [Acceptance Criteria](#).

Rationale

[Reproducibility](#) requires more than rerunning the same command or reusing a [Test Definition](#).

A reproducible [Test Environment](#) requires identification and preservation of the applicable:

- Test Environment identity
- Test Environment [Version](#)
- [Baseline](#)
- [Configuration](#)
- [Resources](#)
- [Operational Resources](#)
- [Nodes](#)
- [Node Sets](#)
- [Deployment Targets](#)
- [Execution Facilities](#)
- [Executable Artifacts](#)

- [Dependencies](#)
- Network conditions
- [Starting Conditions](#)
- Applicable [Governance Policies](#)

Reproducible [Test Execution](#) additionally requires identification and preservation of the applicable:

- Test Definition [Version](#)
- [Test Sequence](#)
- [Sequence Steps](#)
- [Test Argument Values](#)
- [Expected Results](#)
- [Starting Conditions](#)
- [Timing Conditions](#)
- External interactions
- [Execution Path](#)
- [Test Results](#)
- [Verdicts](#)
- Supporting [Evidence](#)

Distributed systems can contain nondeterministic behaviors caused by concurrency, timing, scheduling, communication latency, external services, random values, and failure conditions. Reproducibility therefore does not necessarily require identical Test Results.

The Acceptance Criteria establish:

- Which conditions remain controlled
- Which conditions can vary
- Which Test Results require exact equality
- Which Test Results permit bounded variation
- The permitted tolerances
- The required comparison method
- The treatment of incomplete, interrupted, failed, timed-out, canceled, or repeated [Test Runs](#)

Applies To

This Mission Objective applies to:

- [DIDO-TE](#)
- [Test Environments](#)
- [Test Execution](#)
- [Test Definitions](#)
- [Versions](#)
- [Configurations](#)
- [Test Sequences](#)
- [Sequence Steps](#)
- [Test Argument Values](#)
- [Starting Conditions](#)
- [Timing Conditions](#)
- [Execution Paths](#)

- [Timeouts](#)
- [Test Runs](#)
- [Test Results](#)
- [Expected Results](#)
- [Verdicts](#)
- [Baselines](#)
- [Resources](#)
- [Operational Resources](#)
- [Nodes](#)
- [Node Sets](#)
- [Deployment Targets](#)
- [Execution Facilities](#)
- [Executable Artifacts](#)
- [Dependencies](#)
- [Network conditions](#)
- [External interactions](#)
- [Acceptance Criteria](#)
- [Evidence](#)
- [Provenance](#)
- [Traceability](#)
- [Connected Environments](#)
- [Disconnected Environments](#)
- [Air-Gapped Environments](#)

Verification Allocation

Verification of MO-002 is allocated to:

- [MO-002a — Reproducible Test Environments](#)
- [MO-002b — Reproducible Test Execution](#)

MO-002 is satisfied only when [DIDO-TE](#) satisfies both derived requirements.

Referenced By

The following pages reference this requirement:

- [MO-002a — Reproducible Test Environments](#)
- [MO-002b — Reproducible Test Execution](#)

Delivery Phase

☐ TBD

Implementation Status

☐ Assess the current DIDO-TE implementation against MO-002a, MO-002b, and their supporting Operational, Functional, Logging and Auditing, Reliability, Performance, Data Management, and Interoperability requirements.

Requirement Status

☐ Review and approve the decomposition of MO-002 into MO-002a and MO-002b.

Issues

The following unresolved issues affect this requirement:

- ☐ Confirm the Original Requirement identifiers in the draft DIDO-TE Requirements Register that provide the source for MO-002.
 - ☐ Define the conditions under which DIDO-TE considers a `[[dido:99_annexes:annex-b-terms-and-definitions:t:test_environment|Test Environment]]` reproduced.
 - ☐ Define the conditions under which DIDO-TE considers `[[dido:99_annexes:annex-b-terms-and-definitions:t:test_execution|Test Execution]]` reproduced.
 - ☐ Define which Test Environment characteristics remain controlled during reproduction.
 - ☐ Define which Test Environment characteristics can vary during reproduction.
 - ☐ Define which `[[dido:99_annexes:annex-b-terms-and-definitions:t:test_result|Test Results]]` require exact equality and which permit bounded variation.
 - ☐ Define the permitted Test Result tolerances and comparison methods.
 - ☐ Define the treatment of nondeterministic distributed-system behavior.
 - ☐ Define the treatment of failed, incomplete, interrupted, timed-out, canceled, or repeated `[[dido:99_annexes:annex-b-terms-and-definitions:t:test_run|Test Runs]]`.
 - ☐ Define the `[[dido:99_annexes:annex-b-terms-and-definitions:e:evidence|Evidence]]` required to demonstrate Test Environment and Test Execution reproducibility.
-

Notes for Editors

This page retains the stable parent requirement identifier MO-002.

This page is a non-leaf requirement page and retains a trailing :start in its namespace:

dido:03-dido-te:99-annexes:annex-c-requirements:01-mission-objectives:mo-002:start

MO-002 does not contain a normative Statement. Its derived leaf requirements contain the independently verifiable Statements.

The derived leaf requirements use a **Derived From** section rather than a **Source** section.

The derived requirement identifiers remain:

- MO-002a
- MO-002b

Do not assign these identifiers to unrelated requirements.

Changes to the decomposition preserve:

- [Test Environment](#) reproducibility as the subject of MO-002a
- [Test Execution](#) reproducibility as the subject of MO-002b
- Independent verification of the two outcomes
- [Traceability](#) to the source material
- Traceability between MO-002 and both derived requirements

Incoming Traceability uses the Wiki Backlinks function rather than a manually maintained list.

Do not rename this page or either derived requirement page after an external citation unless a redirect or move plan is in place.

© 2026 Dido Solutions, Inc. and Jackrabbit Consulting, Inc.

From:
<https://wiki.didosolutions.com/> - Dido Solutions, Inc Wiki

Permanent link:
<https://wiki.didosolutions.com/dido/03-dido-te/99-annexes/annex-c-requirements/01-mission-objectives/mo-002/start?rev=1785953348>

Last update: 2026/08/05 11:09

