

MO-001c — Reproducibility

[Go to MO-001 — Repeatable, Compliant, and Secure Infrastructure Environments](#)

Statement

Crucible SHALL reproduce an **Infrastructure Environment** from the same **Controlled Inputs** in accordance with the defined equivalence criteria.

Derived From

This requirement derives from:

- [MO-001 — Repeatable, Compliant, and Secure Infrastructure Environments](#)

The Original Requirement states:

Crucible SHALL enable rapid creation of repeatable, compliant, and secure infrastructure environments.[\[C1\]](#)

MO-001c preserves the portion of the Original Requirement that characterizes Infrastructure Environment creation as **repeatable** by requiring **Crucible** to reproduce an Infrastructure Environment from the same Controlled Inputs.

The separate requirements derived from MO-001 address:

- [MO-001a — Infrastructure Environment Creation](#)
- [MO-001b — Deployment Duration](#)
- [MO-001d — Security Baseline Conformance](#)
- [MO-001e — Compliance Baseline Conformance](#)

Rationale

Reproducibility allows an organization to recreate an Infrastructure Environment from the same Controlled Inputs and determine whether the resulting environments satisfy defined equivalence criteria.

The phrase **the same Controlled Inputs** requires reuse of the same identified input artifacts, configurations, baselines, revisions, and other controlled material.

The equivalence criteria determine which characteristics of the reproduced Infrastructure Environment must match the characteristics of the reference Infrastructure Environment. Exact byte-for-byte identity may not be required for every environment component, but any permitted variation must be defined.

Reproducibility supports:

- Consistent environment creation
- Controlled comparison of Infrastructure Environments
- [Provenance](#)
- [Traceability](#)
- Configuration control
- Defect investigation
- Recovery and replacement
- Independent evaluation of security and compliance outcomes

This requirement does not establish a deployment-duration threshold, [Security Baseline](#), or [Compliance Baseline](#). The other requirements derived from MO-001 address those outcomes.

Applies To

This requirement applies to:

- [Crucible](#)
- [Infrastructure Environments](#)
- Reference Infrastructure Environments
- Reproduced Infrastructure Environments
- [Controlled Inputs](#)
- Controlled Input identifiers and revisions
- Defined equivalence criteria
- [Declarative Descriptions](#)
- [Crucible Descriptions](#)
- [Baselines](#)
- [Baseline Composition](#)
- [Image Layers](#)
- [Infrastructure Baselines](#)
- [Machine Images](#)
- [Infrastructure Configurations](#)
- [Infrastructure Deployment](#)
- [Provisioning](#)
- [Evidence](#)
- [Provenance](#)
- [Traceability](#)

Verification

Verification confirms that:

1. The reference Infrastructure Environment is identified
2. The Controlled Inputs used to create the reference Infrastructure Environment are identified
3. The same Controlled Inputs, including their identifiers and revisions, are used to create the reproduced Infrastructure Environment

4. [Crucible](#) creates the reproduced Infrastructure Environment
5. The equivalence criteria identify the characteristics compared between the reference and reproduced Infrastructure Environments
6. The reference and reproduced Infrastructure Environments satisfy the defined equivalence criteria
7. Any permitted differences between the reference and reproduced Infrastructure Environments conform to the equivalence criteria
8. The verification record preserves [Traceability](#) among the Controlled Inputs, the reference Infrastructure Environment, the reproduced Infrastructure Environment, and the equivalence evaluation

Referenced By

The following pages reference this requirement:

- [MO-001a — Infrastructure Environment Creation](#)
- [MO-001b — Deployment Duration](#)
- [MO-001d — Security Baseline Conformance](#)
- [MO-001e — Compliance Baseline Conformance](#)
- [Annex D: Requirements Traceability](#)

Delivery Phase

Implemented and Verified

Implementation Status

☐ Assess whether the current Crucible implementation reproduces Infrastructure Environments from the same Controlled Inputs in accordance with the defined equivalence criteria.

Requirement Status

☐ Review and accept MO-001c as a proposed derived requirement created from the evaluation and decomposition of MO-001 in the Crucible System Requirements Specification, Version 1.1 Draft.

Issues

The following unresolved issues affect this requirement:

☐ Identify the controlling source that defines the equivalence criteria for reproduced Infrastructure

Environments.

- ☐ Identify the Infrastructure Environment characteristics that must remain equivalent across repeated creation.
 - ☐ Identify any permitted differences between the reference and reproduced Infrastructure Environments.
 - ☐ Determine whether reproducibility requires identical Controlled Input revisions or permits controlled substitution of equivalent inputs.
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Notes for Editors

This requirement page should retain the stable requirement identifier MO-001c.

This page is a leaf requirement page and omits a trailing :start from its namespace.

The parent MO-001 page is a non-leaf page and retains a trailing :start in its namespace.

Changes to the Statement should preserve:

- [Crucible](#) as the responsible actor
- Reproduction of an [Infrastructure Environment](#) as the required outcome
- Reuse of the same [Controlled Inputs](#)
- Evaluation of the reproduced Infrastructure Environment against defined equivalence criteria

The unresolved equivalence criteria should remain recorded in the Issues section until a controlling source defines them.

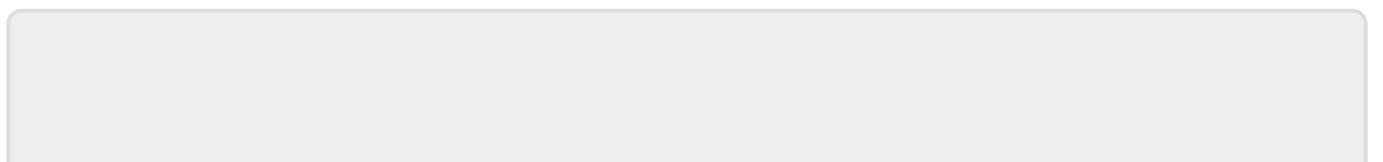
Material changes should receive review and should update the verification criteria, source records, and Issues section.

To reference this requirement Statement from another wiki page, insert:

```
{{section>dido:02-crusible:99-annexes:annex-c-requirements:01-mission-objectives:mo-001:mo-001c#Statement&noheader&nofooter&noeditbtn}}
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Last update: **2026/07/30 05:20**

