

ENV-004e — Control Random Values

[Go to ENV-004 — Provide Deterministic Test Environment](#)

Statement

The [DIDO-TE](#) SHALL control each random value source in accordance with the applicable [Test Definition](#).

Derived From

- [ENV-004 — Provide Deterministic Test Environment](#)
- [\[DTE5\] DIDO-TE Requirements Register](#), source requirement identifier and obligation to be assigned
- [\[DTE6\] Structured Information Processing Reference Architecture \(SIP-RA\)](#)
- [\[DTE7\] Federated Data Interpretation Systems Reference Architecture \(FDIS-RA\)](#)

Rationale

Random and pseudorandom values influence data generation, sampling, scheduling, security behaviour, simulated events, fault injection, and other aspects of [Test Execution](#).

A pseudorandom value source produces a repeatable sequence when it uses the same algorithm, seed, parameters, and invocation sequence. A nondeterministic source does not necessarily provide this repeatability.

The applicable Test Definition identifies the random value sources requiring control. It also specifies the required algorithms, seeds, parameters, invocation conditions, or recording criteria.

Control of random value sources supports the interpretation, [Reproducibility](#), and [Comparability](#) of [Test Results](#).

Applies To

- [Test Environment](#)
- [Test Definition](#)
- [Test Execution](#)
- [Test Object](#)
- [Node](#)
- [Test Resource](#)
- [Configuration](#)
- [Constraint](#)
- [Evidence](#)

Verification

Verification confirms that:

- The applicable Test Definition identifies each random value source that influences the Test Execution.
- The Test Definition classifies each identified source as deterministic or nondeterministic.
- Each controlled pseudorandom value source uses the specified algorithm, seed, and parameters.
- Each controlled pseudorandom value source produces the specified sequence under equivalent invocation conditions.
- The DIDO-TE records the output of each applicable nondeterministic source.
- The DIDO-TE detects an unidentified or incorrectly configured random value source.
- The DIDO-TE records random value source identities, configurations, seeds, parameters, outputs, and detected deviations as [Evidence](#).
- The DIDO-TE maintains [Traceability](#) among each random value source, the Test Definition, the Test Execution, the Evidence, and the Test Results.
- An unidentified, incorrectly configured, unrecorded, or untraceable random value source constitutes nonconformance with this requirement.

Verification includes:

- Inspection of the random value sources identified by the Test Definition
- Inspection of algorithms, seeds, parameters, and invocation conditions
- Repetition of a Test Execution using equivalent pseudorandom source settings
- Comparison of the resulting pseudorandom value sequences
- Inspection of values obtained from applicable nondeterministic sources
- A negative assessment using an incorrect seed, algorithm, or parameter
- A negative assessment using an unidentified random value source
- Confirmation that the DIDO-TE detects and records each deviation
- Inspection of Evidence and Traceability records
- Confirmation that each negative assessment produces a nonconformance result

Referenced By

Plugin Backlinks: Nothing was found.

Related Architecture Sections

- Add links to the architecture sections governing random value generation, Test Configuration, Test Execution, Evidence, Reproducibility, and Traceability.

Delivery Phase

Assign the applicable delivery phase.

Requirement Status

Draft

Statement Reference

Use the following syntax to reference this requirement's Statement section from another DokuWiki page:

```
{{section>dido:03-dido-te:99-annexes:annex-c-requirements:02-test-environment-requirements:env-004-provide-deterministic-test-environment:env-004e-control-random-values#Statement&noheader&nofooter&noeditbtn}}
```

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