

DO-331 Compliance Documentation

Standard Reference

DO-331: Model-Based Development and Verification Supplement to DO-178C and DO-278A

Addressed Objectives

MB.1 - High-Level Requirements

Objective	How Addressed
MB.1.1	Traceability matrix links model to requirements
MB.1.2	Bidirectional traceability supported
MB.1.3	Test case mapping via trace framework

MB.2 - Model Development

Objective	How Addressed
MB.2.1	IR-to-Model transformation preserves semantics
MB.2.2	SysML 2.0 standard format
MB.2.3	Deterministic transformation

MB.3 - Detail Design

Objective	How Addressed
MB.3.1	Action definitions from functions
MB.3.2	State machines from behavioral specs
MB.3.3	Complete structural mapping

MB.4 - Model Verification

Objective	How Addressed
MB.4.1	Review checklist generation
MB.4.2	Static analysis support
MB.4.3	Test vector generation framework
MB.4.4	Coverage point tracking

MB.5 - Model Coverage

Objective	How Addressed
MB.5.1	Automatic coverage instrumentation
MB.5.2	DAL-appropriate coverage
MB.5.3	Coverage reporting

MB.6 - Configuration Management

Objective	How Addressed
MB.6.1	Hash-based artifact identification
MB.6.2	Traceability to source IR
MB.6.3	Deterministic output

Tool Qualification

Classification

Tool Type: Development Tool (Criteria 3 - Output Verified)

TQL Level: TQL-5 (when output is verified by qualified downstream tools)

Rationale

1. STUNIR generates models, not executable code
2. Users verify model output with their own tools
3. Users generate code using DO-330 qualified code generators
4. All transformation rules are documented
5. Deterministic output enables reproducibility

Qualification Evidence

- Tool Operational Requirements (TOR)
- Tool Qualification Plan (TQP)

- Test cases for all transformation rules
- SPARK proof artifacts

Limitations

1. **Code Generation:** STUNIR does NOT generate executable code from models. Users must use their own qualified tools.
2. **Model Simulation:** STUNIR does NOT simulate models. Users must use qualified simulation tools.
3. **Requirements Management:** STUNIR traces to requirements but does not manage requirements.