

DO-331 Coverage Guide

Overview

Model coverage analysis per DO-331 Table MB-A.5.

Coverage Types

| Type | Description | Required For |
|---------------------|---------------------------|--------------|
| State_Coverage | Each state visited | DAL A, B, C |
| Transition_Coverage | Each transition executed | DAL A, B, C |
| Decision_Coverage | Each decision true/false | DAL A, B |
| Condition_Coverage | Each condition true/false | DAL A |
| MCDC_Coverage | MC/DC analysis | DAL A only |
| Entry_Coverage | Function entry points | All DALs |
| Exit_Coverage | Function exit points | All DALs |

DAL Requirements (DO-331 Table MB-A.5)

DAL A

- Modified Condition/Decision Coverage (MC/DC)
- Decision Coverage
- Statement Coverage
- State Coverage
- Transition Coverage

DAL B

- Decision Coverage
- Statement Coverage
- State Coverage
- Transition Coverage

DAL C

- Statement Coverage
- State Coverage
- Transition Coverage

DAL D/E

- Minimal requirements

Coverage Point Format

```

action def ProcessInput {
  // D0-331 Coverage Point: CP_ENTRY_1 (entry)
  first start;

  then if input > threshold [
    // D0-331 Coverage Point: CP_DEC_1_T (decision_true)
    then assign result := true;
  ] else [
    // D0-331 Coverage Point: CP_DEC_1_F (decision_false)
    then assign result := false;
  ]

  // D0-331 Coverage Point: CP_EXIT_1 (exit)
  then done;
}

```

Coverage Report

```

{
  "schema": "stunir.coverage.do331.v1",
  "statistics": {
    "total_points": 42,
    "instrumented": 42,
    "covered": 0
  },
  "dal_coverage": {
    "DAL_A": {
      "required": 42,
      "achieved": 0,
      "percent": 0,
      "meets_objective": false
    }
  }
}

```