How to perform the

Unit Testing

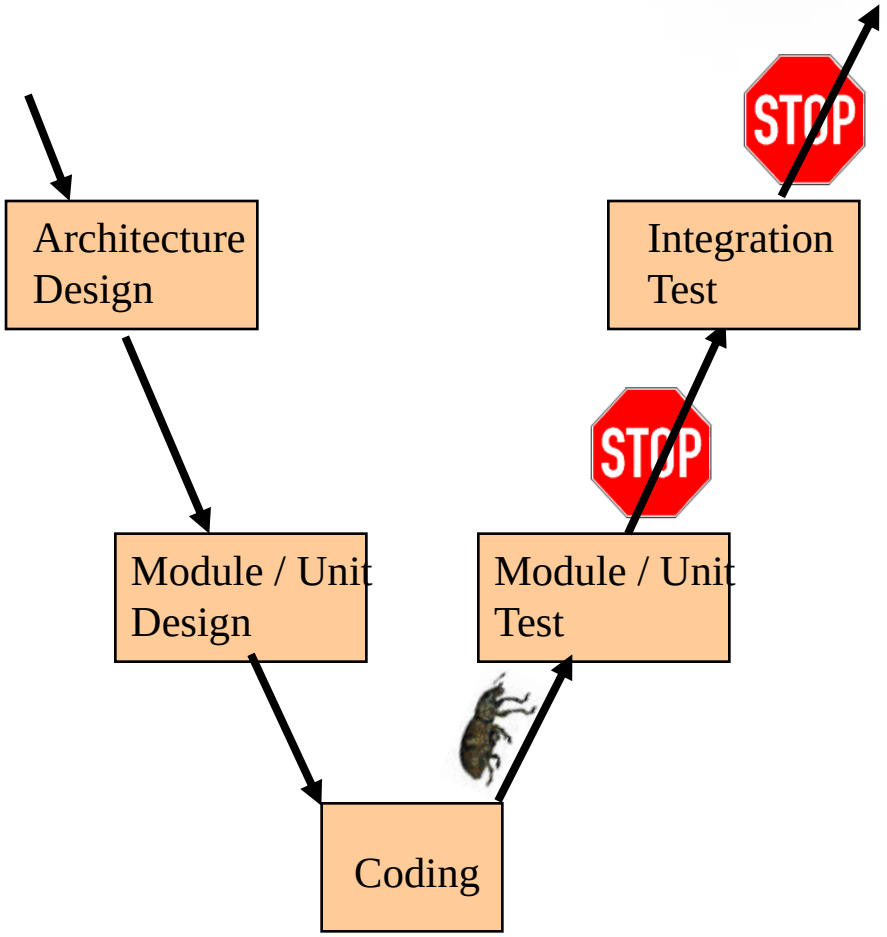
and

Integration Testing

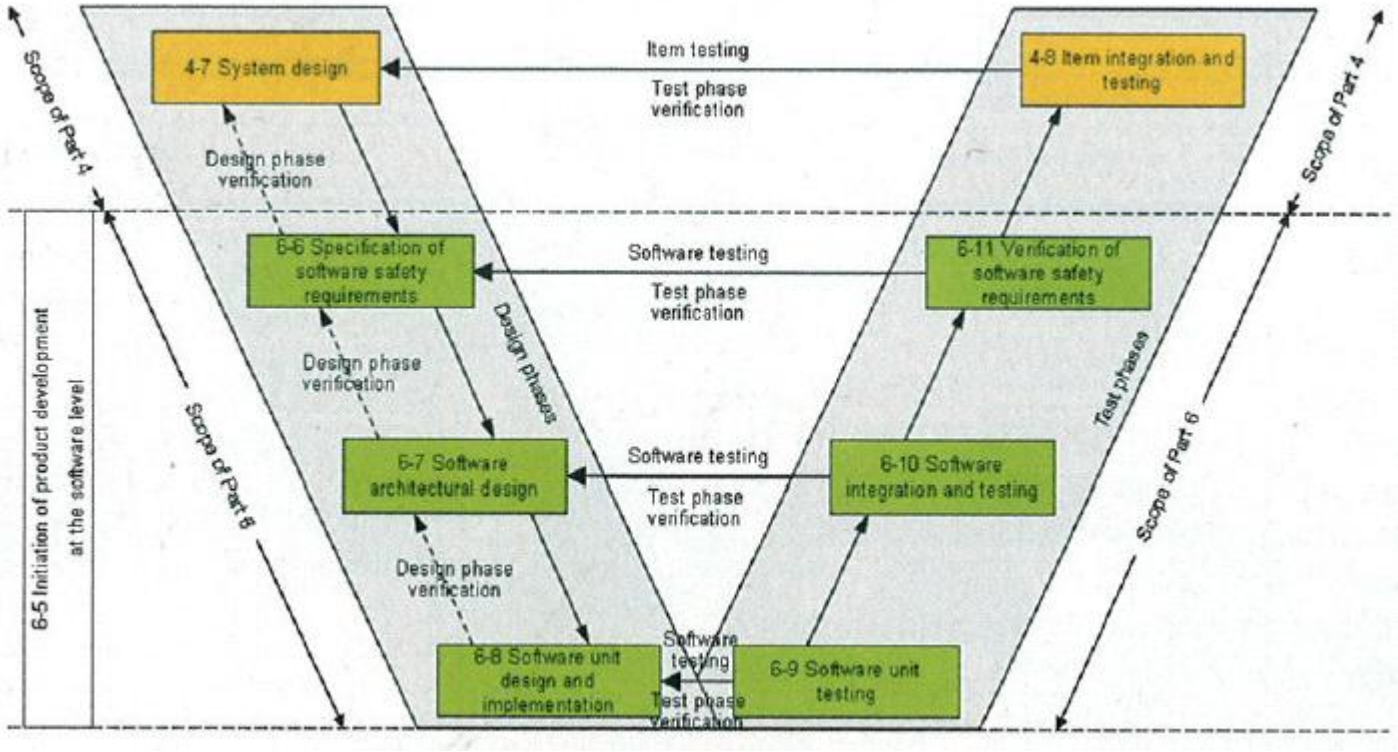
required by

ISO 26262

General V-Model of System Engineering



26262 V-Model of System Engineering



ISO 26262 Requirements

Table 11 — Methods for deriving test cases for software unit testing

	Methods	ASIL			
		A	B	C	D
1a	Analysis of requirements	++	++	++	++
1b	Generation and analysis of equivalence classes[a]	+	++	++	++
1c	Analysis of boundary values[b]	+	++	++	++
1d	Error guessing[c]	+	+	+	+

[a] Equivalence classes can be identified based on the division of inputs and outputs, such that a representative test value can be selected for each class.

[b] This method applies to interfaces, values approaching and crossing the boundaries and out of range values.

[c] Error guessing tests can be based on data collected through a "lessons learned" process and expert judgment.

The Classification Tree Method (tool included in Tessy) supports 1a, 1b, 1c and even 1d.

ISO 26262 Requirements

ISO/FDIS 26262-6:2010(E)

Table 12 — Structural coverage metrics at the software unit level

	Methods	ASIL			
		A	B	C	D
1a	Statement coverage	++	++	+	+
1b	Branch coverage	+	++	++	++
1c	MC/DC (Modified Condition/Decision Coverage)	+	+	+	++

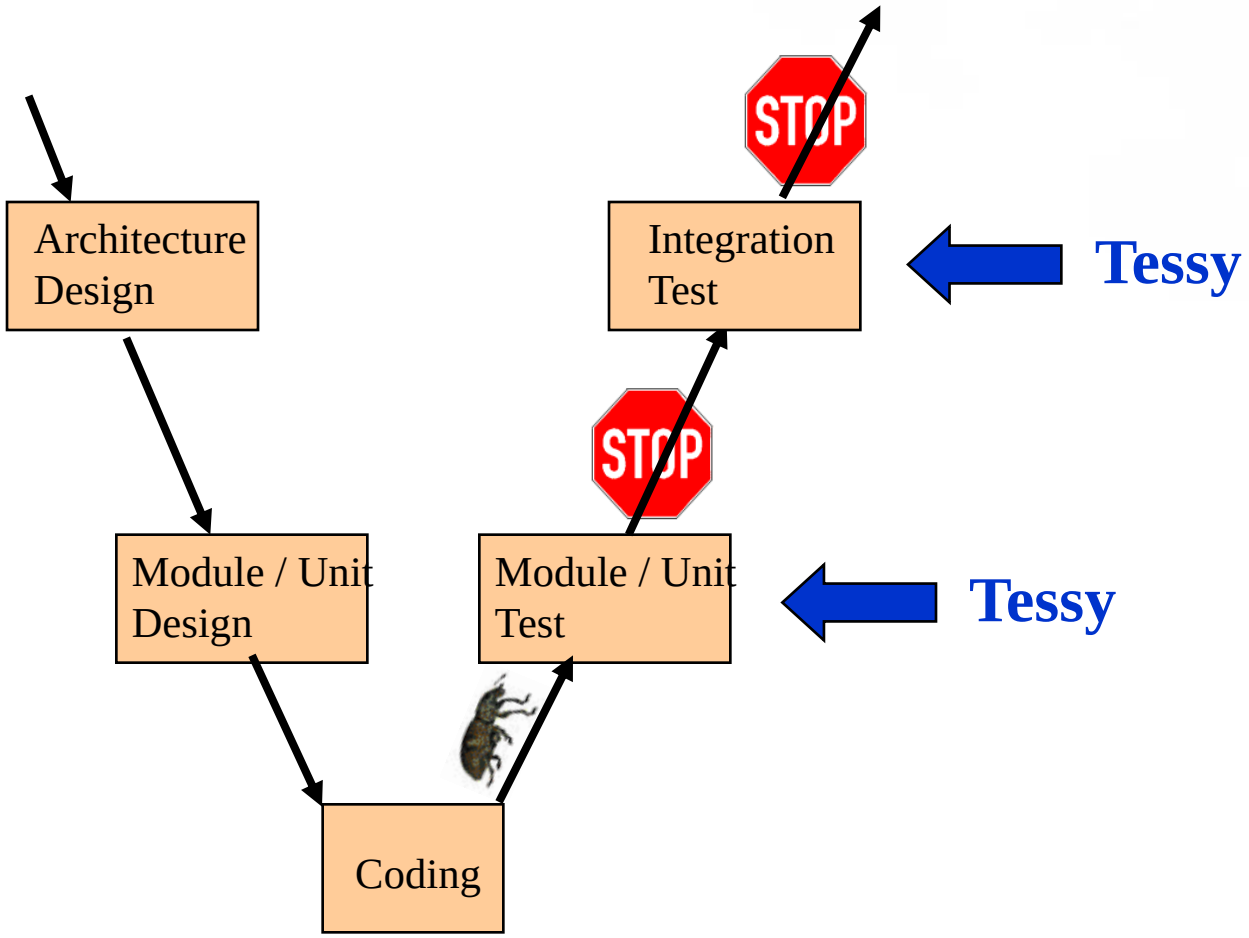
NOTE 1 The structural coverage can be determined by the use of appropriate software tools.

NOTE 2 In the case of model-based development, the analysis of structural coverage can be performed at the model level using analogous structural coverage metrics for models.

NOTE 3 If instrumented code is used to determine the degree of coverage, it can be necessary to show that the instrumentation has no effect on the test results. This can be done by repeating the tests with non-instrumented code.

9.4.6 The test environment for software unit testing shall correspond as closely as possible to the target environment. If the software unit testing is not carried out in the target environment, the differences in the source and object code, and the differences between the test environment and the target environment, shall be analysed in order to specify additional tests in the target environment during the subsequent test phases.

Tool in use - Tessy



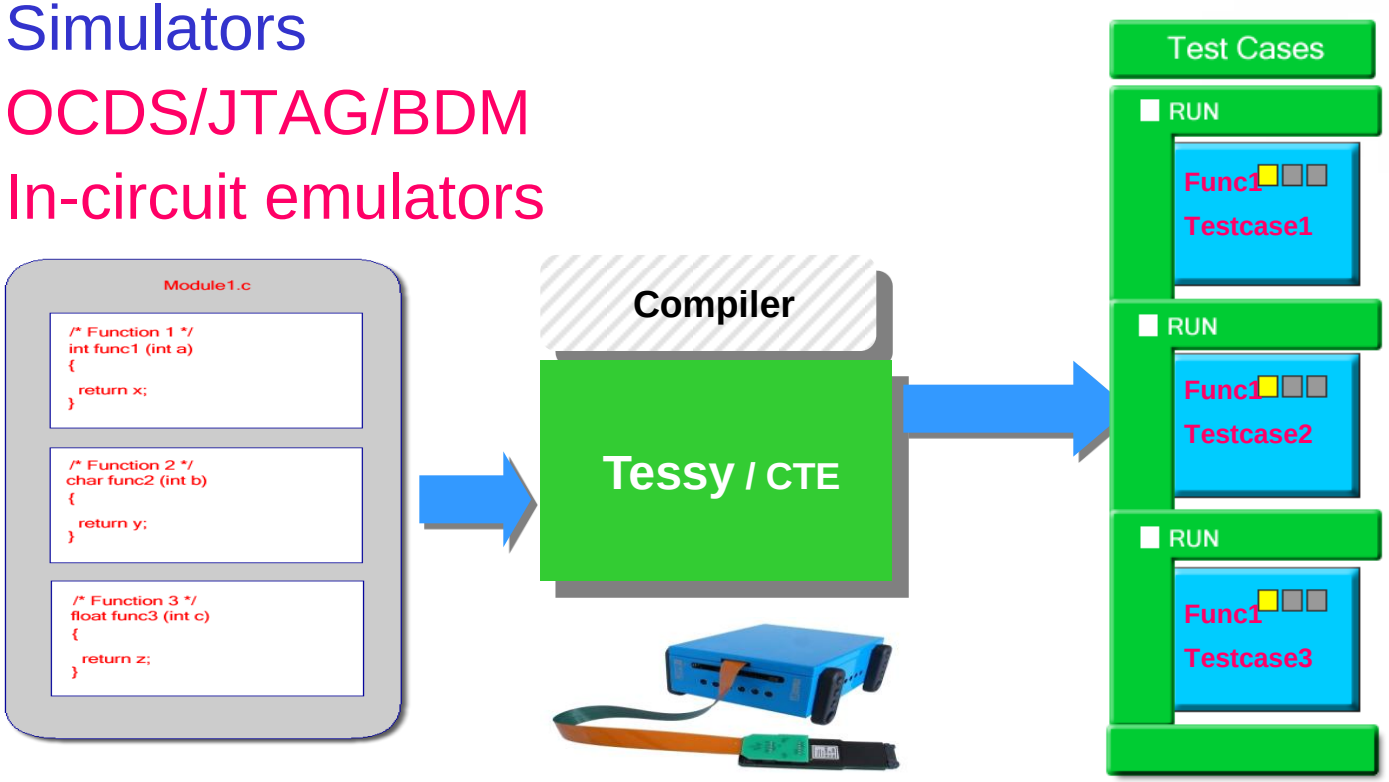
So What isTessy ?

- Tessy Provide Module tests and Integration tests according to below standards:
  - **IEC 61508 (ISO 26262), all SIL levels**
  - **DO178B, all levels**
  - **Automotive SPiCE (2005)**
- **Test coverage**
  - Branch coverage
  - MCC, MC/DC coverage

	Methods
1a	Statement coverage
1b	Branch coverage
1c	MC/DC (Modified Condition/Decision Coverage)

Tessy supports All relevant

- Microcontroller Architectures
- Cross-compiler for embedded systems
- Simulators
- OCDS/JTAG/BDM
- In-circuit emulators



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CERTIFICATE ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CER

CERTIFICATE

No. Z10 11 12 78930 001

Holder of Certificate: **Razorcat Development GmbH**
Witzlebenplatz 4
14057 Berlin
GERMANY

Factory(ies): 78930

Certification Mark:

Product: **Software Tool for Safety Related Development**

Model(s): **Tessy**

Parameters:

Tool Classification: T2 (acc. to IEC 61508)
TCL3 (acc. to ISO 26262)

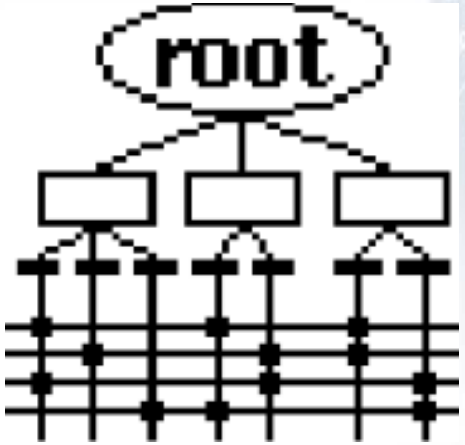
The verification tool fulfills the requirements for support tools according to IEC 61508-3.
The tool is qualified to be used in safety-related software development according to IEC 61508 and ISO 26262.
The test report is a mandatory part of this certificate.

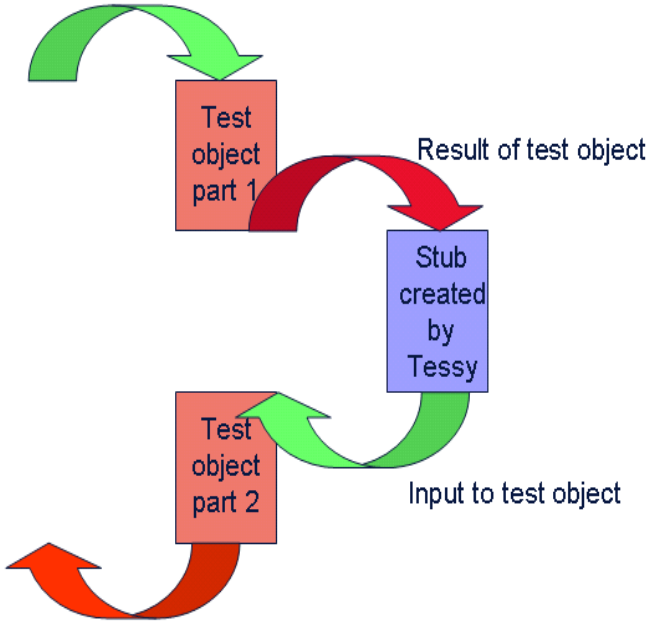
Tested according to:

IEC 61508-3:2010
ISO 26262-8:2011

Tessy's Features

- **Systematic Test Case Design**
  - According to the Classification Tree Method
  - Intuitive, Graphical representation of test specifications.
  - Easy to learn
- **Reproducible tests**
- Automatic test driver generation
- **Test execution on the target** and evaluation of test results
- **Standardized test reporting** and documentation
- **Powerful regression testing**

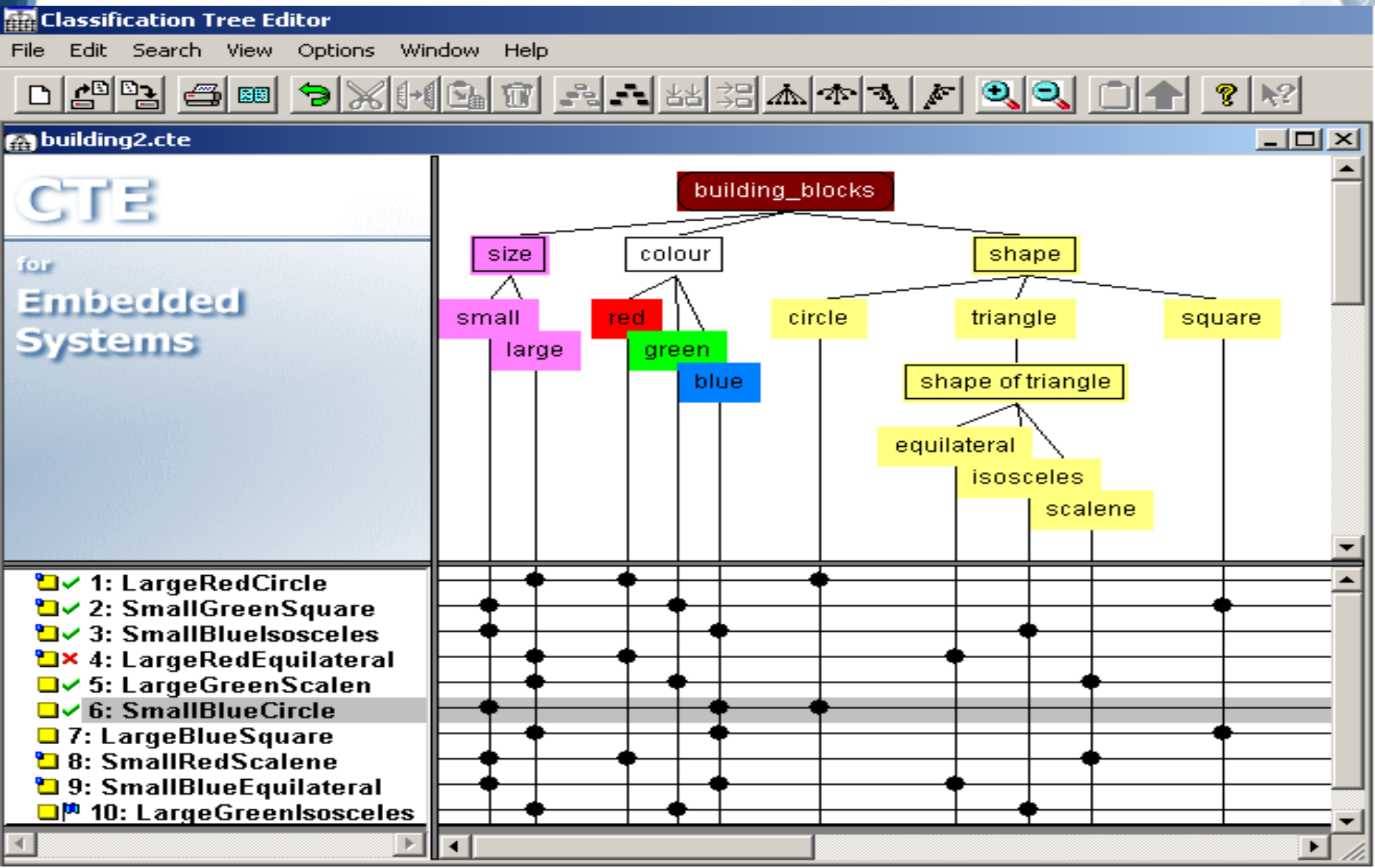




FLASH TECHNOLOGY
One Stop Tools Solution

Tessy®

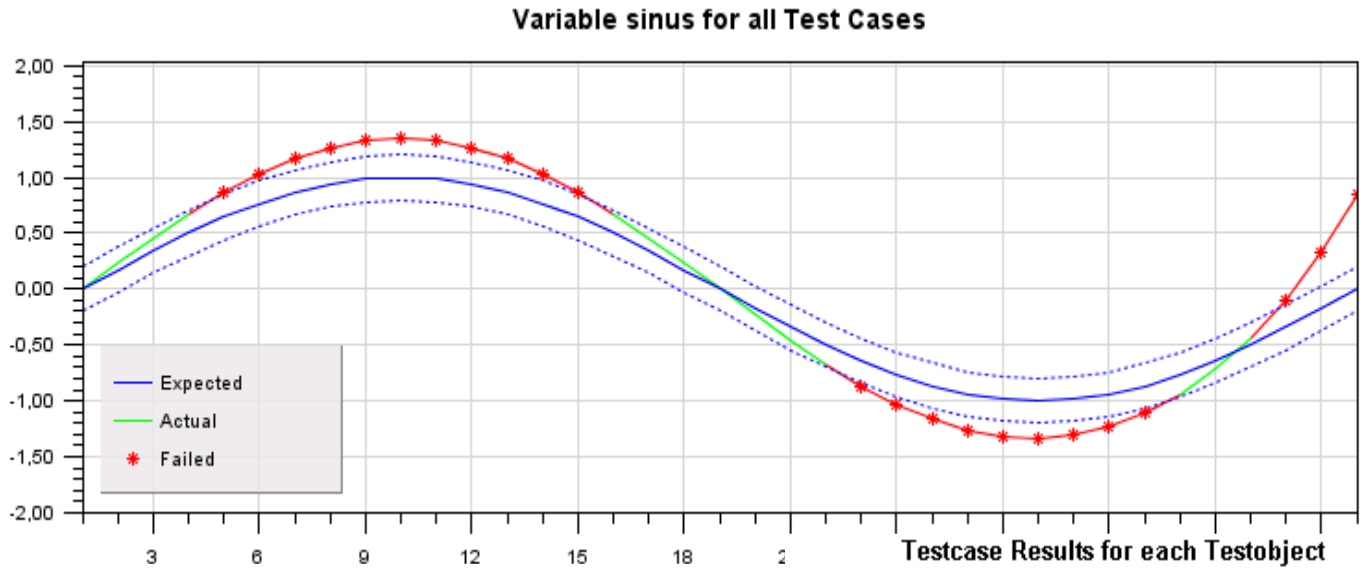
Test Planning-Classification Tree Editor (CTE)



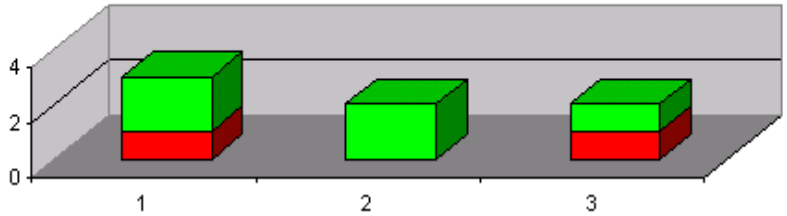
Various Testing Report

- **Excerpt from test reports**

Testobject Result Plot:

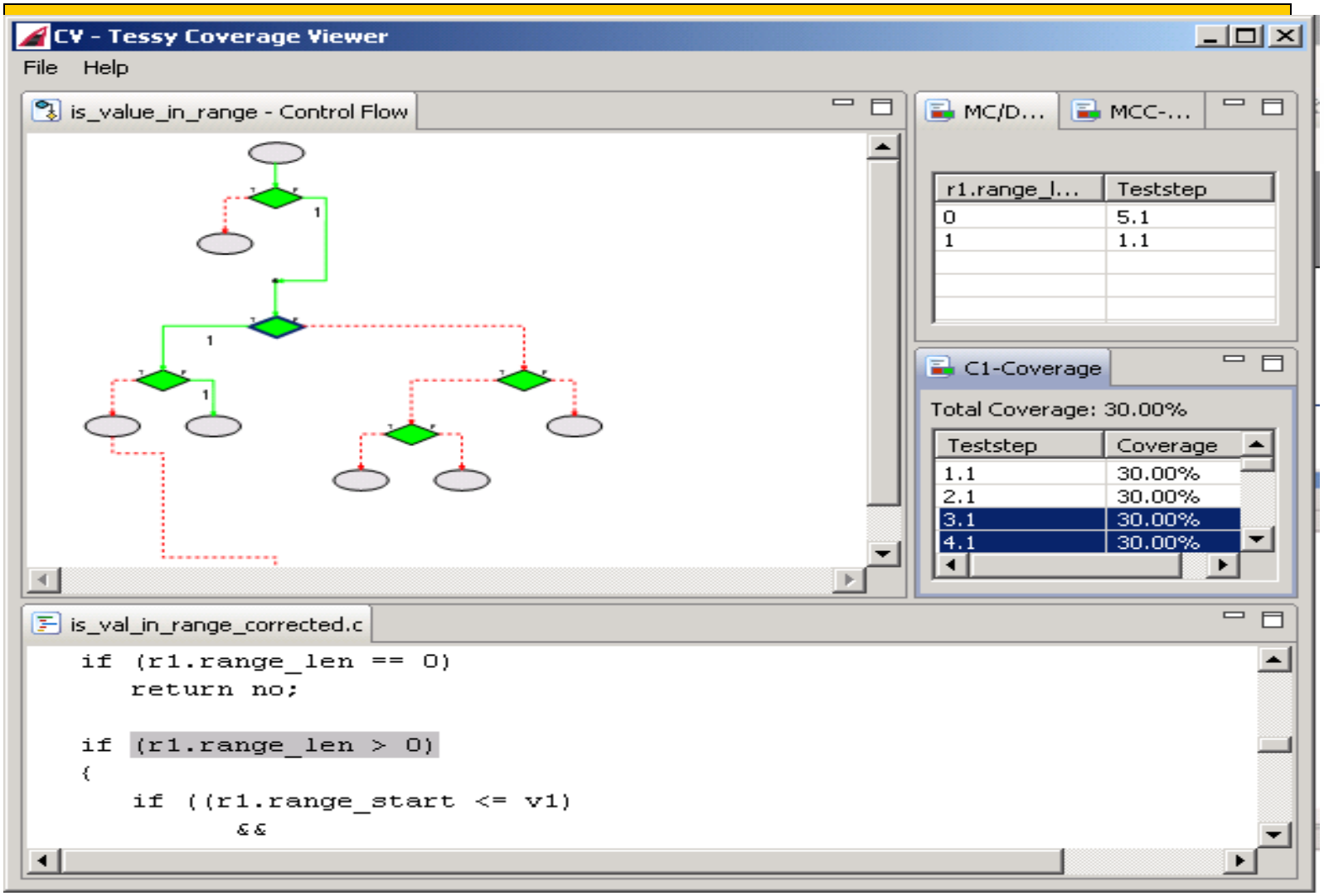


Testcase 2

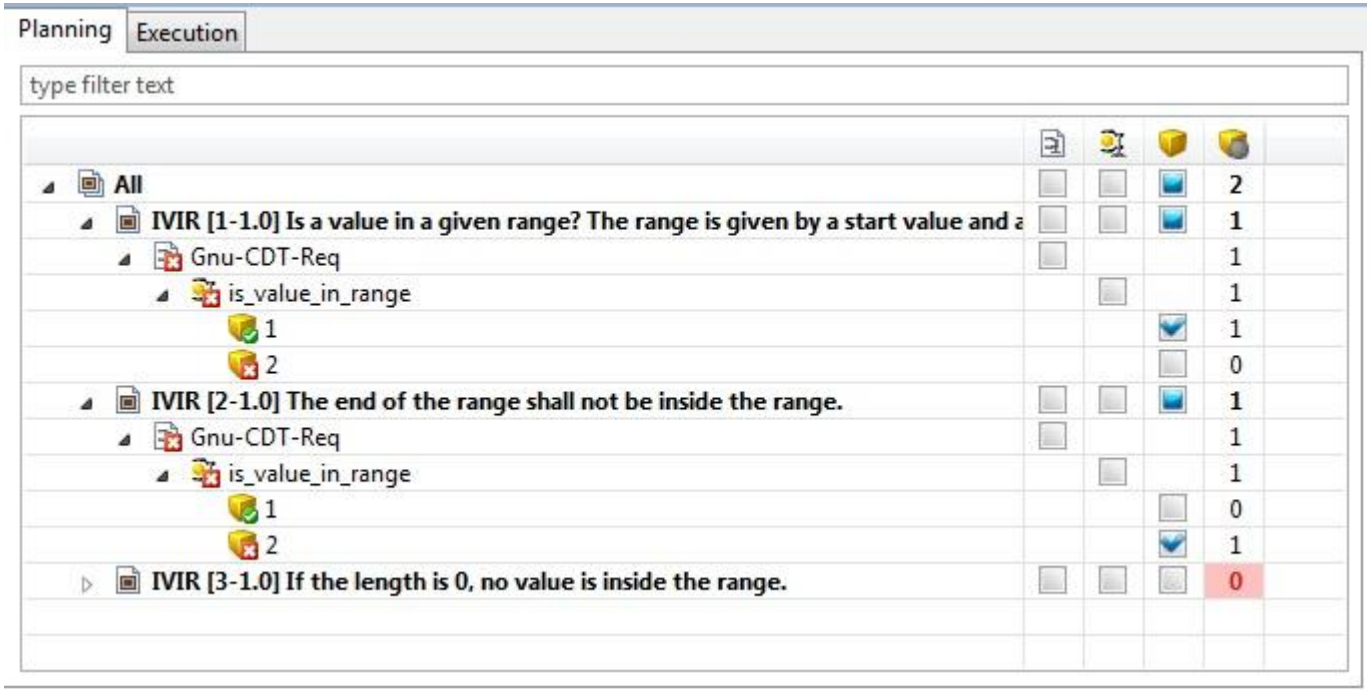


Teststep 2.1				
Name	Input Value			
r1.range_start	5			
r1.range_len	2			
v1	7			
Name	**Actual Value**	**Eval**	**Expected Value**	**Result**
is_value_in_range	yes	==	no	✗

Coverage Result Viewer



Traceability Requirements/Test cases



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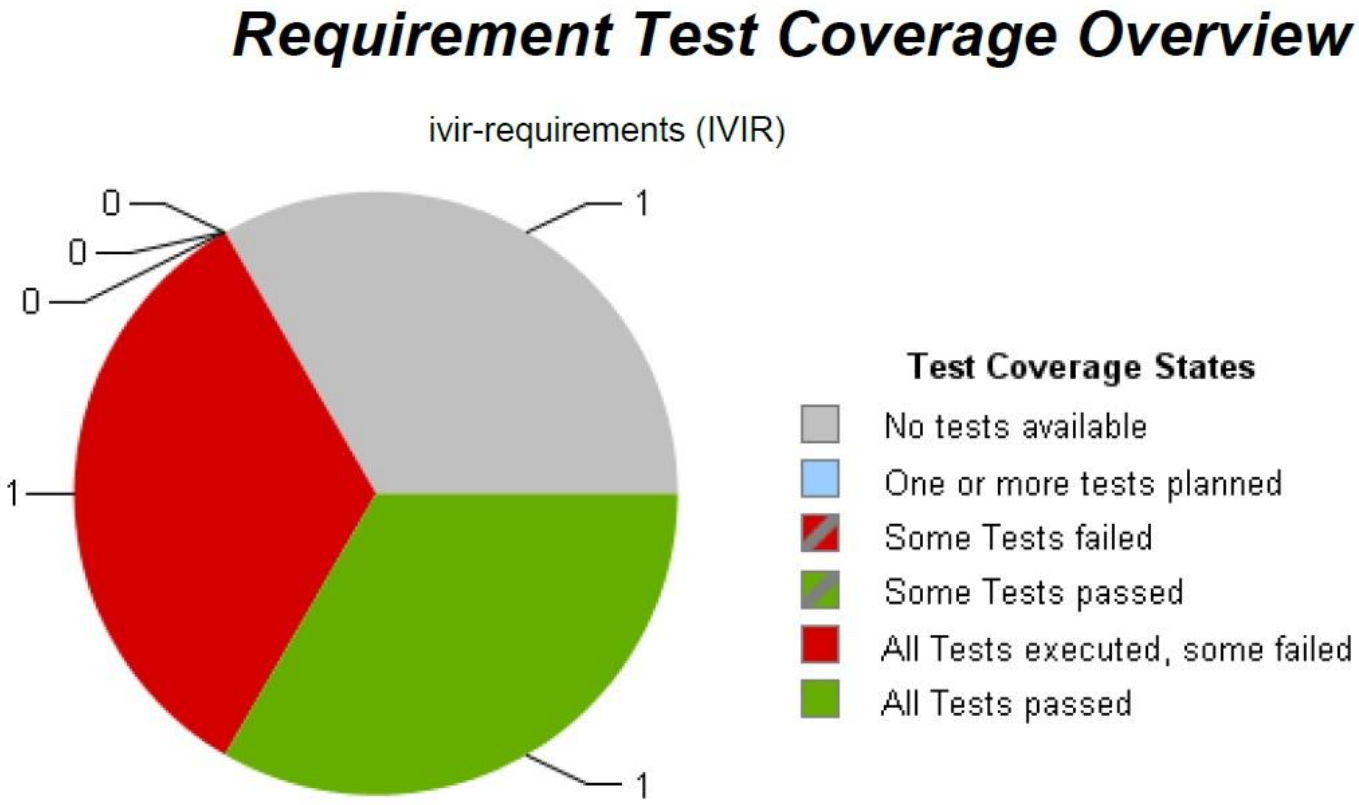

Email to sales@flashtech.com.cn for demo