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# Tool Qualification-Kit for Testwell CTC++ Test Coverage Analyser

# Content

- **Overview**
- Qualification Method
- Example: First Qualification Steps
  - Installation
  - Qualification Planning
  - Text Execution & Analysis
- Availability and feedback

# Testwell CTC Qualification Kit

- **Conforms to ISO 26262, DO-330, DO-178C, IEC 61508, EN 50128**
- **Based on a qualification model for Testwell CTC++**
  - Flexible, i.e. fit for *many* purposes
  - Process integration: considers development process
  - Minimal effort: integrate existing verification activities
  - Extensible: User can add tests and mitigations
- **Covers:**
  - Language C,
  - Coverage: Statement, conditions, MC/DC,
  - report generation: text, xml, html
- **Developed together with VALIDAS**
- **Q-Kit contains**
  - User Manual
  - Qualification Support Tool
  - Test cases for Testwell CTC++
  - Test Automation Unit to run tests
  - V&V Report
  - 8 hours of qualification support from Validas AG
- **Price: please contact us**

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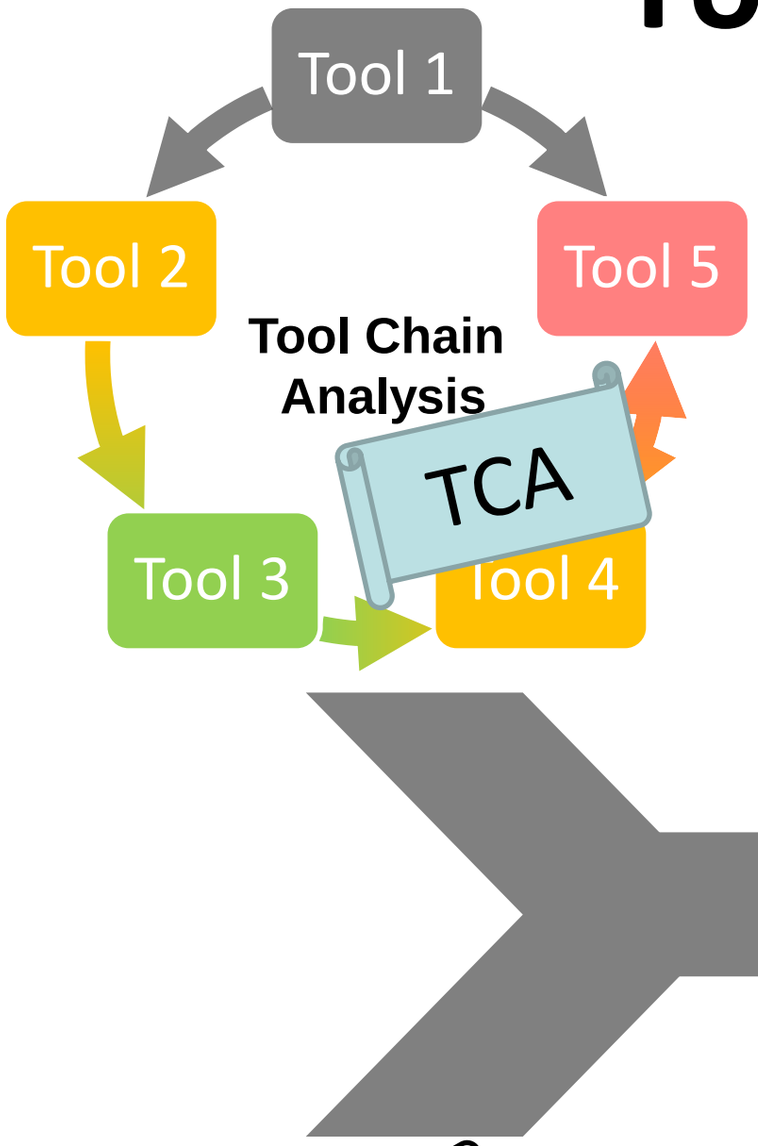
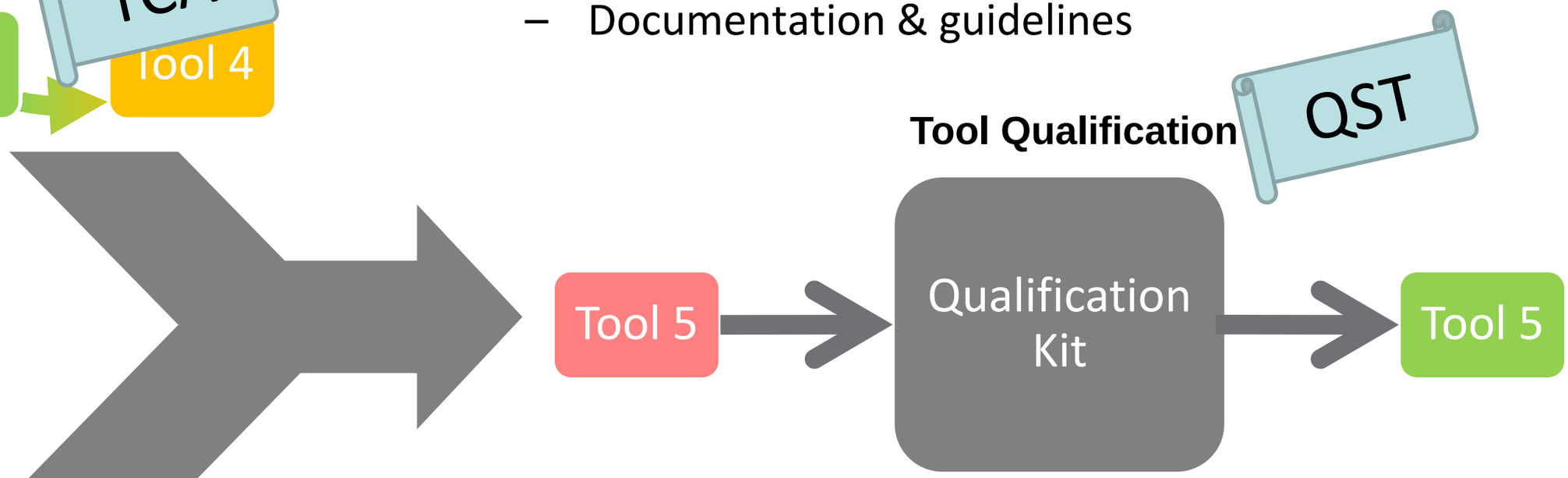
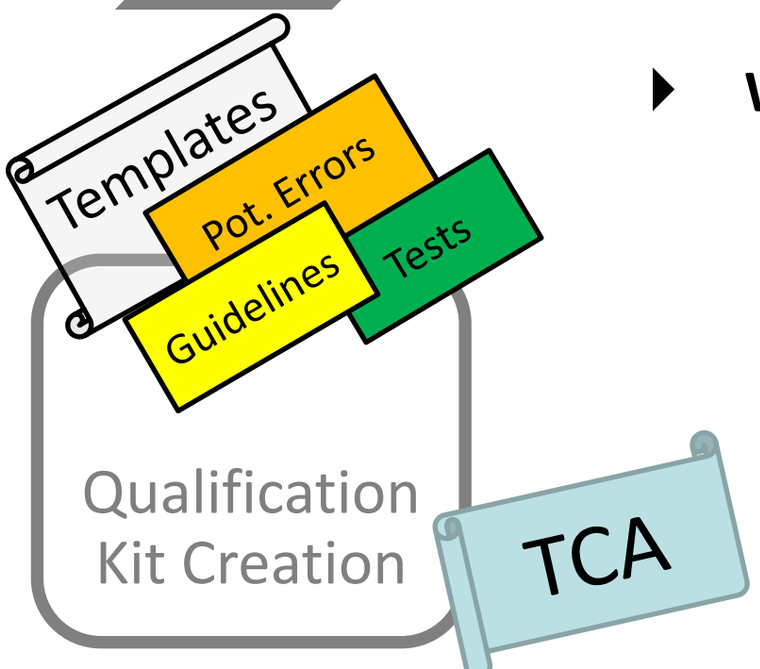
# Tool Qualification




- **Standards (ISO 26262, IEC 61508, DO 178, EN 50128) require a safe usage of all SW development tools**
  - Tool classification: Determine impact & qualification needs
  - Critical tools: Qualification
  - Documentation & guidelines




- **We consider the following processes**
  - **Tool Chain Analysis**: Classification of all tools (TCA)
  - **Tool Qualification**: Qualification of one tool, e.g. by application of a qualification kit with a qualification support tool (QST)
  - **Qualification Kit Creation (TCA)**
    - **Create support for classification**
    - **Create support for qualification**

# Tool Classification & Qualification

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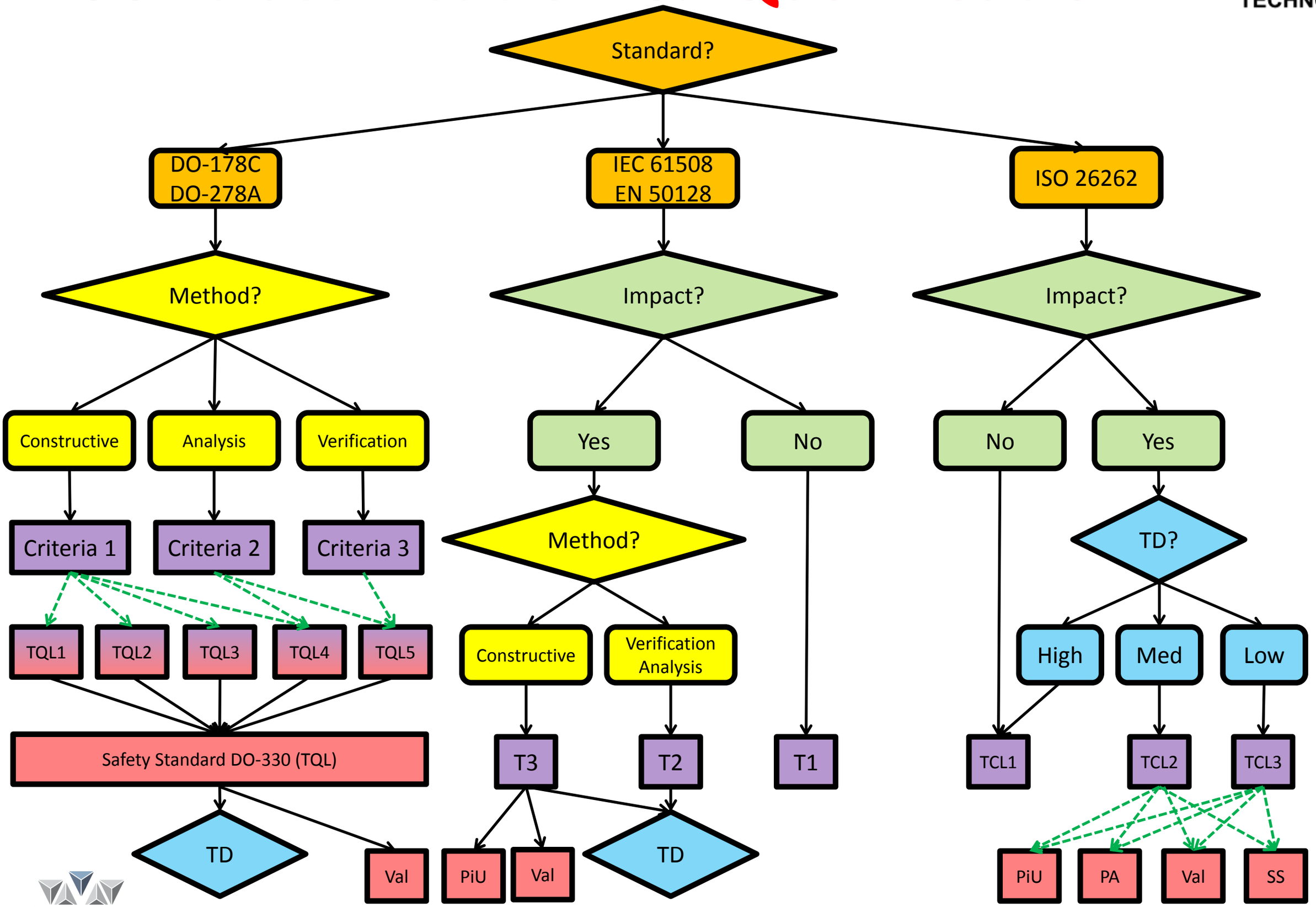
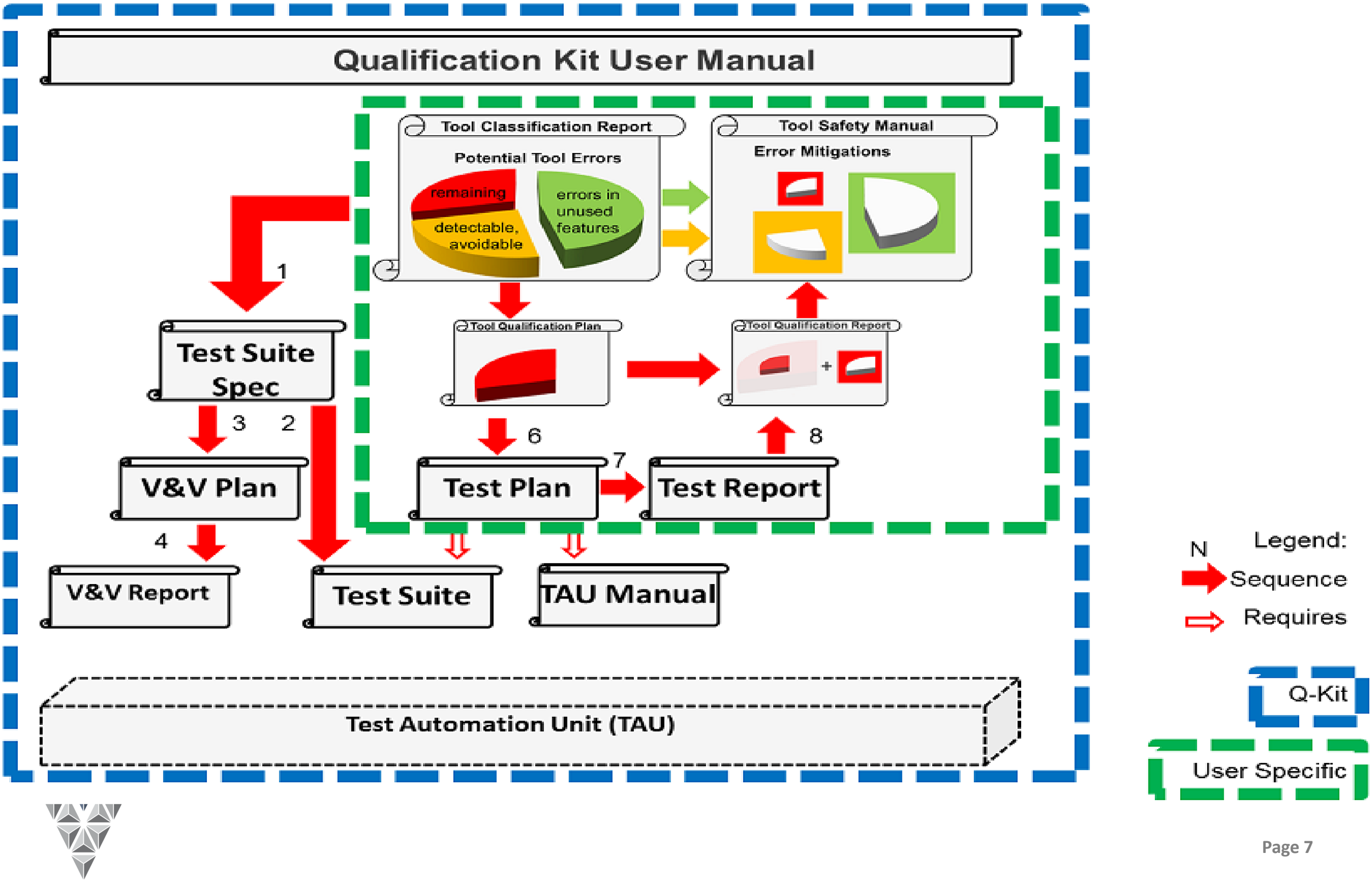



The verification objectives of the tool operational verification and validation process consist of the detection and reporting of errors that may have been introduced during the tool development processes.

# Qualification by Validation



# Model-Based Tool Qualification

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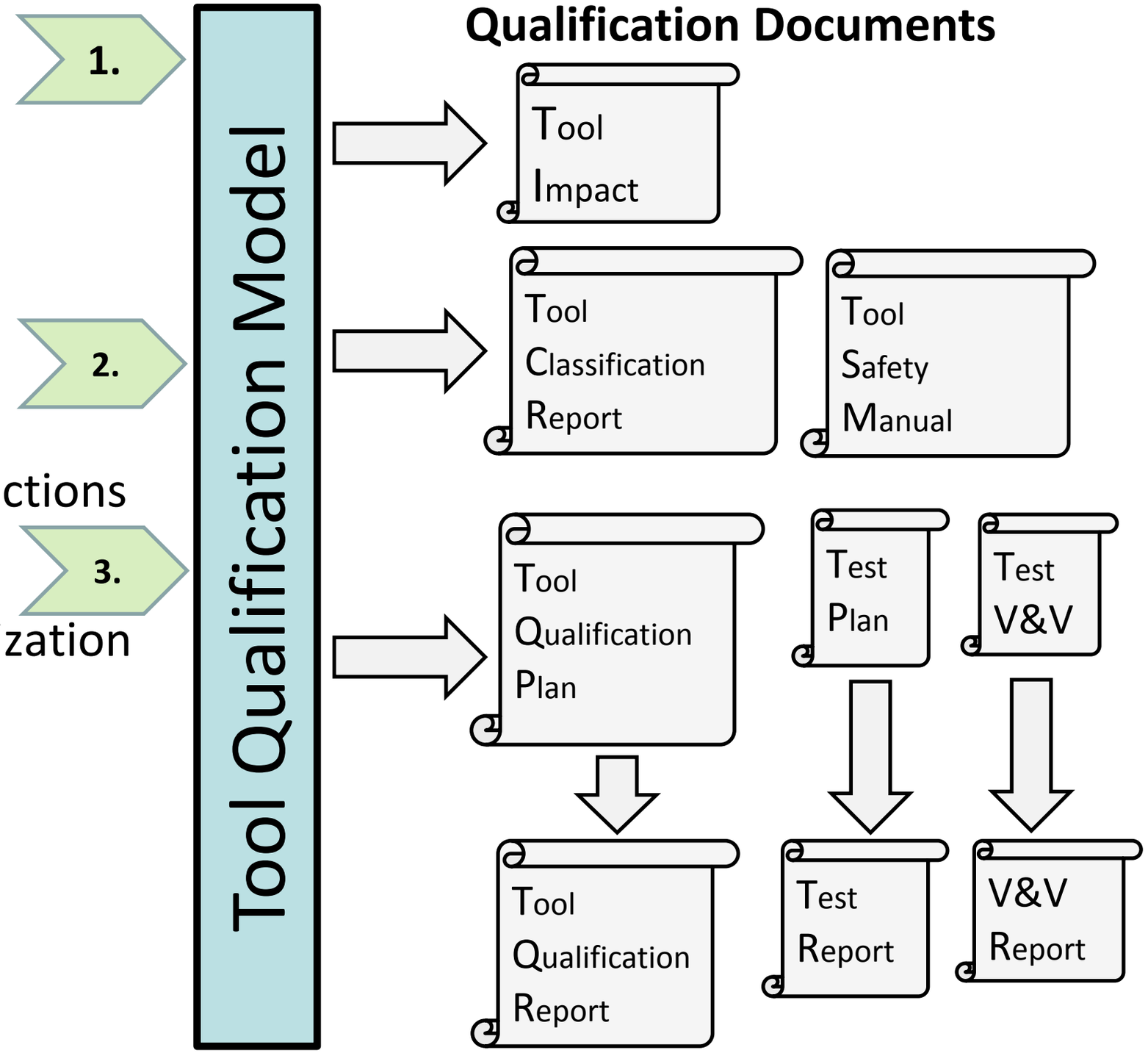
1. **Structure Modeling**
   - Use-Cases,
   - Relevant tool features,
   - Artifacts
2. **Analysis Modeling**
   - Potential errors
   - Available checks & restrictions
3. **Qualification Modeling**
   - Qualification cost optimization
   - Qualification planning
   - Qualification tests
     - Identification
     - Assignment to
       - Features
       - Errors




**1. Application of Qualification Kit**
**2. + 3. Creation of Qualification Kit**

# Tools & Generated Artifacts

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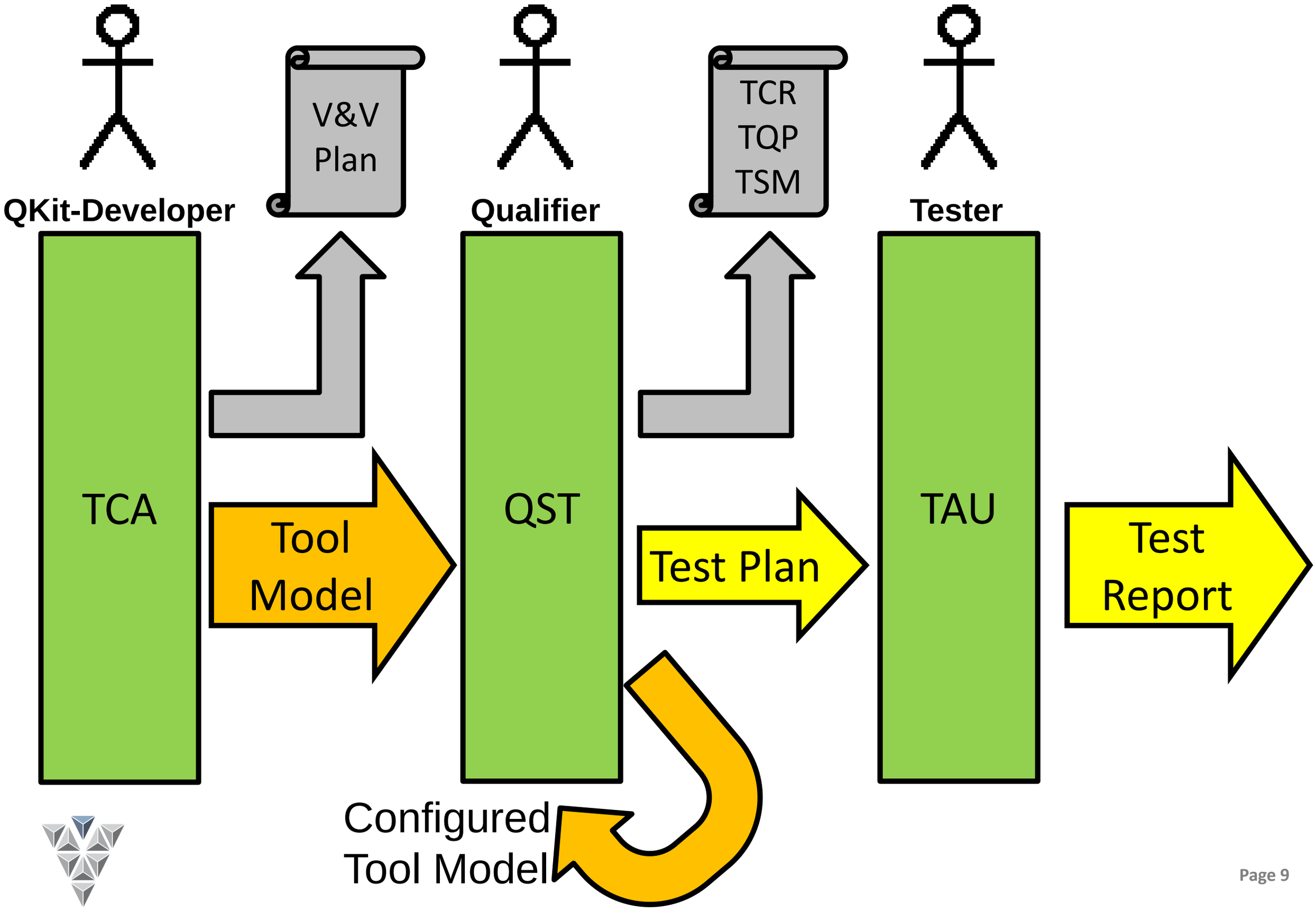

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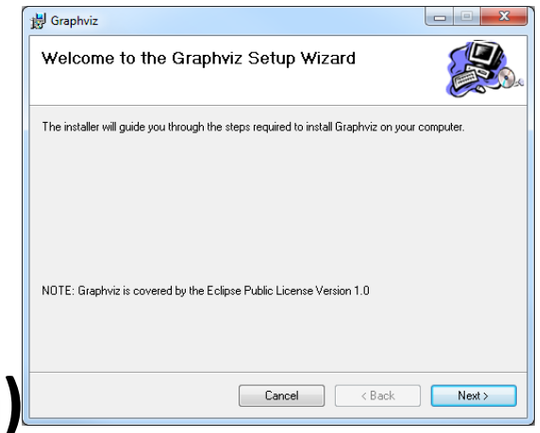
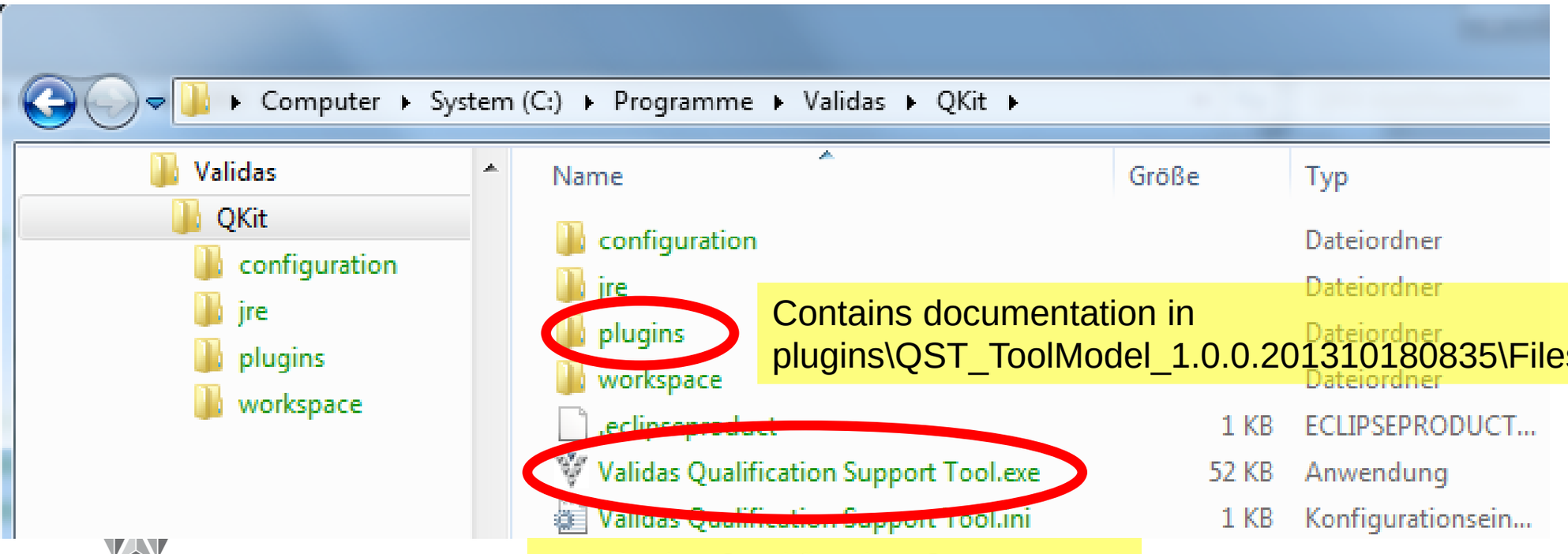
# Installation





- Install Graphviz (document generation) from http://www.graphviz.org
- Install Python 3.2 or higher (test execution) from http://www.python.org/download/releases/3.2/ and add it to your search PATH
- Install CTC
- Install Qualification Kit
  - Get QKit_Qual-win32.win32.zip


  - Unpack it, e.g. into C:\Program Files\Validas\QKit




Contains documentation in plugins\QST_ToolModel_1.0.0.201310180835\Files\QKit\Documentation

This is the Qualification Support Tool

# Content

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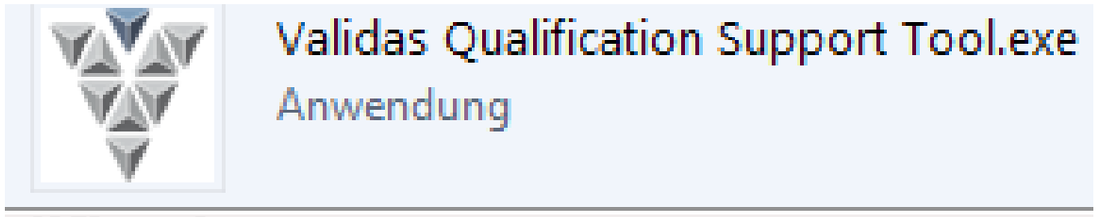
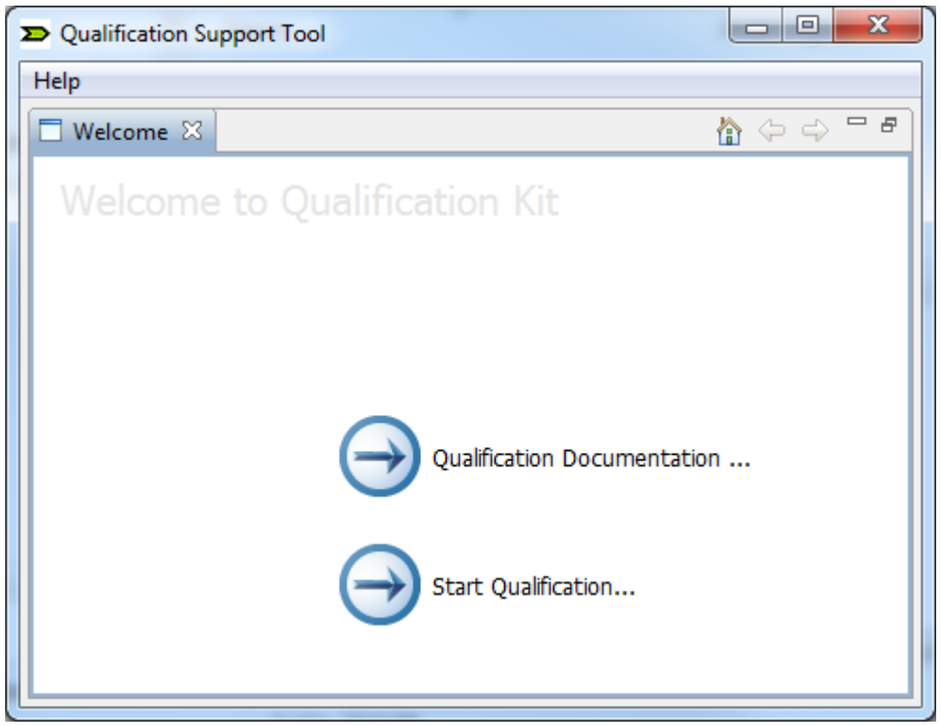
# Start QST

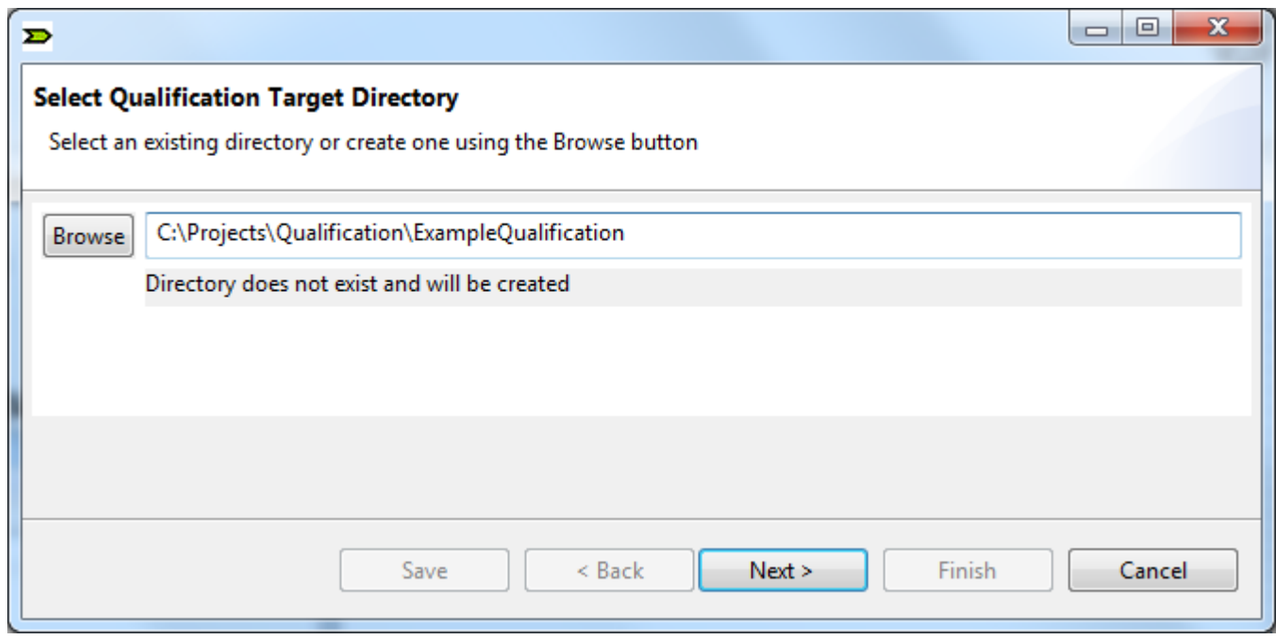
- Details can be found in documentation (QKit User Manual)
- Double click on



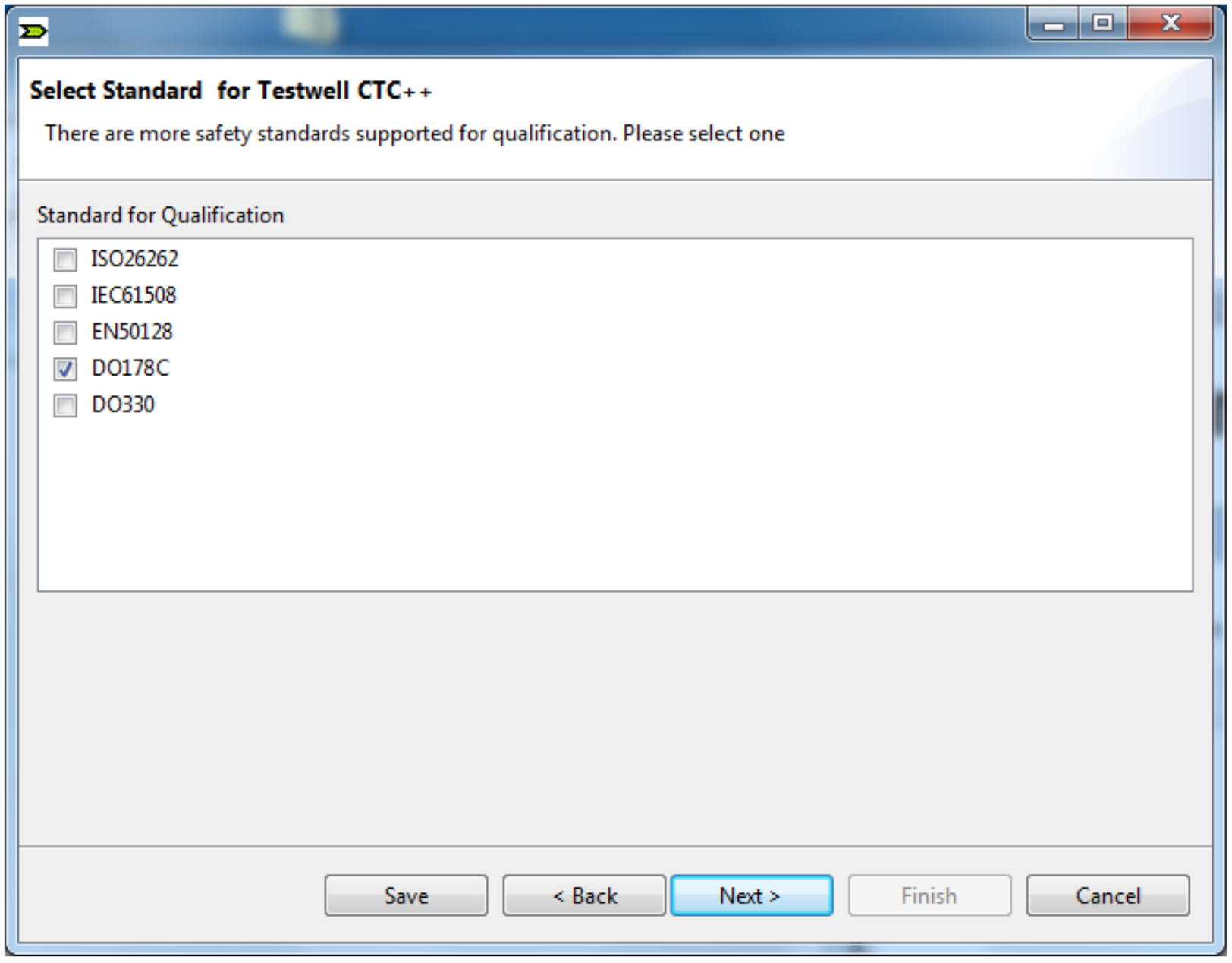

- Click on Start Qualification



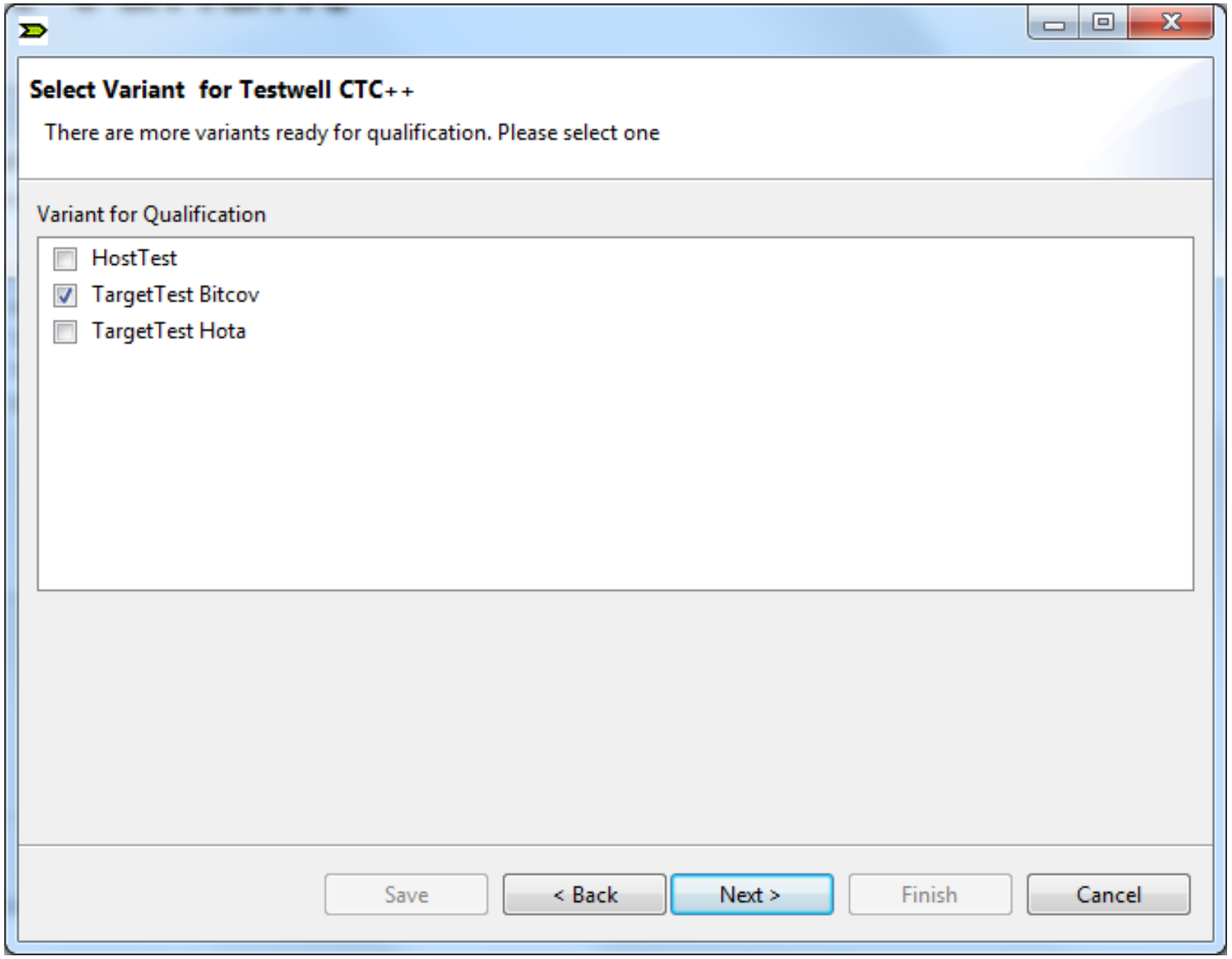

- Select an (empty/non-existent) Directory for Qualification, e.g. C:\Projects\Qualification\ ExampleQualification



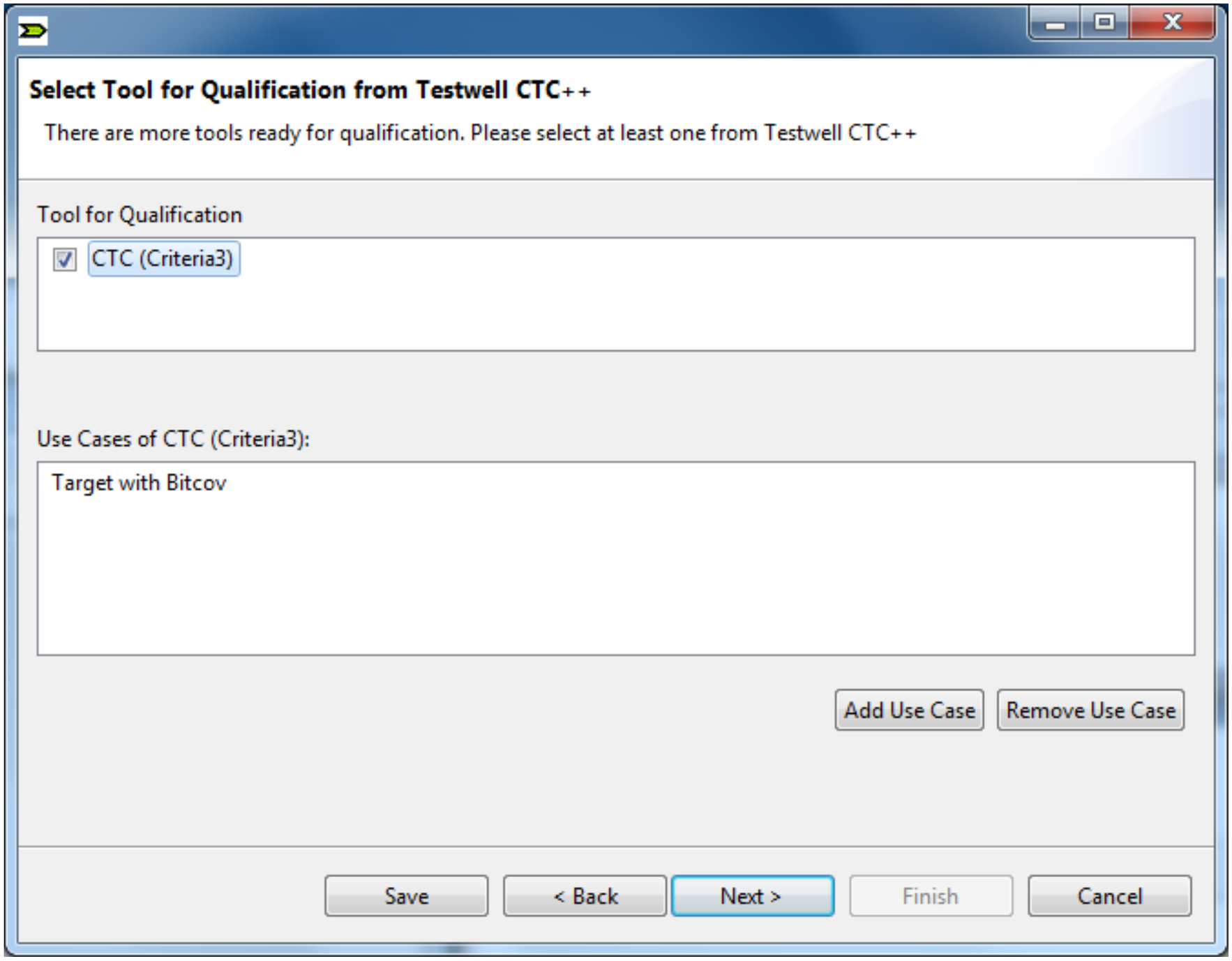
# Select Qualification Standard



# Select Variant



# Select Tool


Select Tool for Qualification from Testwell CTC++
There are more tools ready for qualification. Please select at least one from Testwell CTC++
Tool for Qualification
CTC (Criteria3)
Use Cases of CTC (Criteria3):
Target with Bitcov
Add Use Case
Remove Use Case
Save
< Back
Next >
Finish
Cancel

# Configure Use Case (Default)

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**Use Case Definition**

Define your Use Case of "CTC" for qualification: Select Features and Mitigations

**Use Case Target with Bitcov with 29 Features and 55 Errors: 0 Tested, 55 Mitigated, 0 Untested. Known Bugs: 6/6 mitigated**

**Identification**

Name: Target with Bitcov

**Features**

- CTC
  - Counters (Selection is mitigatable)
    - Counter Size 1 Bit (mitigatable)
  - Coverage (Selection is mitigatable)
    - Condition (mitigatable)
    - Decision (mitigatable)
    - Function (mitigatable)
    - MC/DC (mitigatable)
    - Multicondition (mitigatable)
    - Statement (mitigatable)
  - ctc.exe (Selection is mitigatable)
    - CodeExclusion (mitigatable)
    - Instrumentation (Selection is mitigatable)
      - -i d (mitigatable)
      - -i f (mitigatable)
      - -i m (mitigatable)
  - ctc2dat.exe (mitigatable)
  - ctc2html.bat (mitigatable)
  - ctc2static.bat (mitigatable)
  - ctcpost.exe (Selection is mitigatable)
    - -fc (mitigatable)
    - -fd (mitigatable)
    - -ff (mitigatable)
    - -fmcdc (mitigatable)
    - -p (mitigatable)
    - -t (mitigatable)
    - -u (mitigatable)
    - -x (mitigatable)
    - FileExclusion (mitigatable)

**Potential Errors**

- CTC
  - Incomplete Instrumentation of ? Operator (mitigated)
  - Instrumentation only in Control Structures (mitigated)
  - Non Compilable Code (mitigated)
  - Non Compilable String Code (mitigated)
  - Tool Crash of Ctcpost (mitigated)
  - Uninstrumented Global Code (mitigated)
  - Uninstrumented or Non Compiling Code for ^ (mitigated)
  - Counters (mitigated)
    - Counter Size 1 Bit (mitigated)
  - Coverage (mitigated)
    - *Inferred Feature Error Condition Coverage Too High in Condition (mitigated)*
    - *Inferred Feature Error Condition Coverage Too Low in Condition (mitigated)*
    - *Inferred Feature Error Decision Coverage Too High in Decision (mitigated)*
    - *Inferred Feature Error Decision Coverage Too Low in Decision (mitigated)*
    - *Inferred Feature Error Function Coverage Too High in Function (mitigated)*
    - *Inferred Feature Error Function Coverage Too Low in Function (mitigated)*
    - *Inferred Feature Error MC/DC Coverage Too High in MC/DC (mitigated)*
    - *Inferred Feature Error MC/DC Coverage Too Low in MC/DC (mitigated)*
    - *Inferred Feature Error MultiCondition Coverage Too High in Multicondition (mitigated)*
    - *Inferred Feature Error MultiCondition Coverage Too Low in Multicondition (mitigated)*
    - *Inferred Feature Error Statement Coverage Too High in Statement (mitigated)*
    - *Inferred Feature Error Statement Coverage Too Low in Statement (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in Statement (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in Condition (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in Decision (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in MC/DC (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in Multicondition (mitigated)*
    - *Inferred Feature Error Wrong Behaviour in Function (mitigated)*

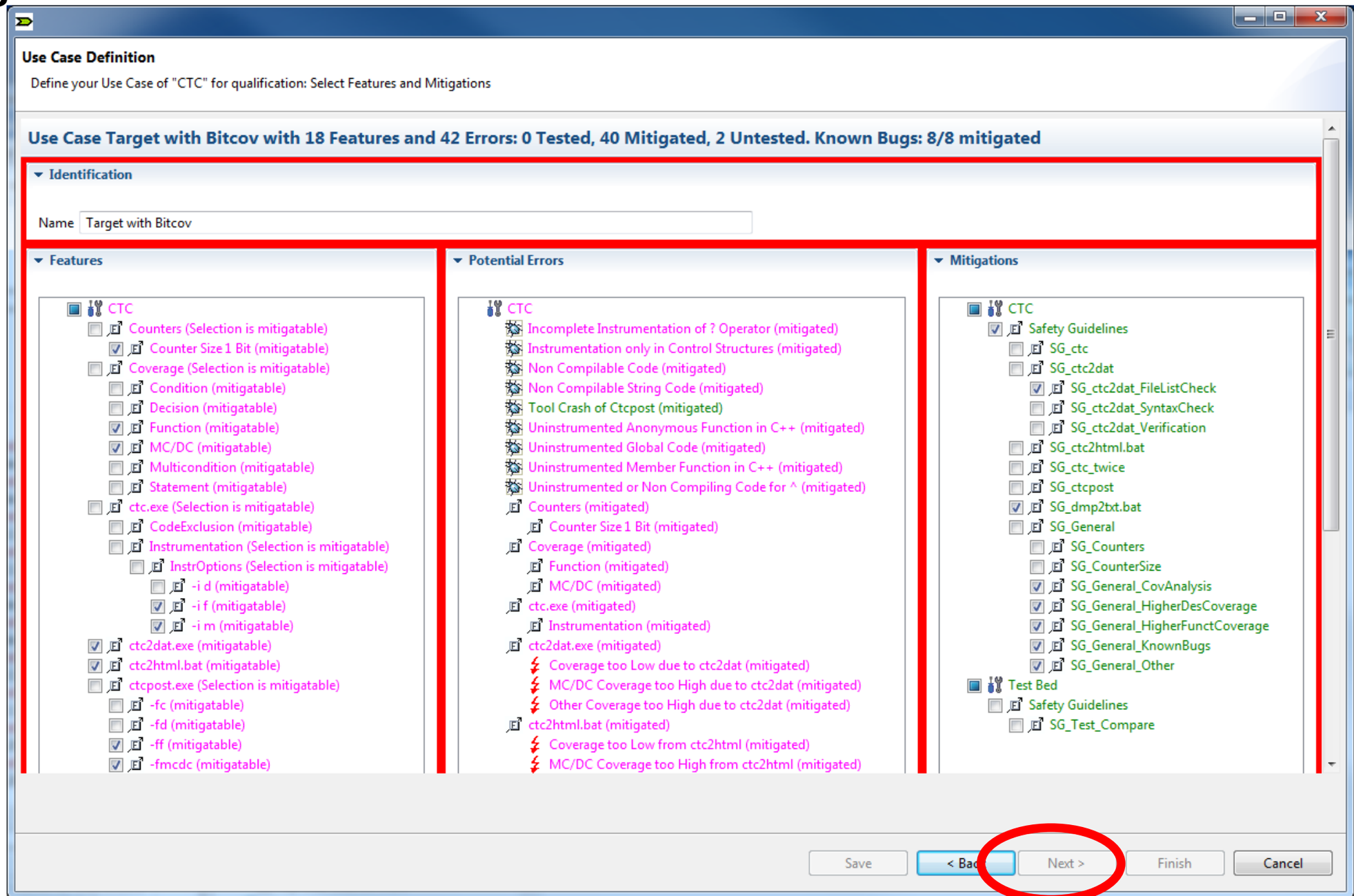
**Mitigations**

- CTC
  - Safety Guidelines
    - SG_ctc
      - SG_CodeExclusion
      - SG_CounterLocation
      - SG_CoverageView
        - SG_CoverageViewCondition
        - SG_CoverageViewDecision
        - SG_CoverageViewFunction
        - SG_CoverageViewMCDC
      - SG_FileSelection
      - SG_General_CoverageAnalysis
      - SG_General_KnownBugs
      - SG_InstrVerification
      - SG_ReportUntested
      - SG_ReportXML
      - SG_StatementCoverage
    - SG_ctc2dat
    - SG_ctc2html.bat
    - SG_ctc_twice
    - SG_dmp2txt
- Test Bed
  - Safety Guidelines
    - SG_Test_Compare

Save | < Back | Next > | Finish | Cancel

# Configure Use Case

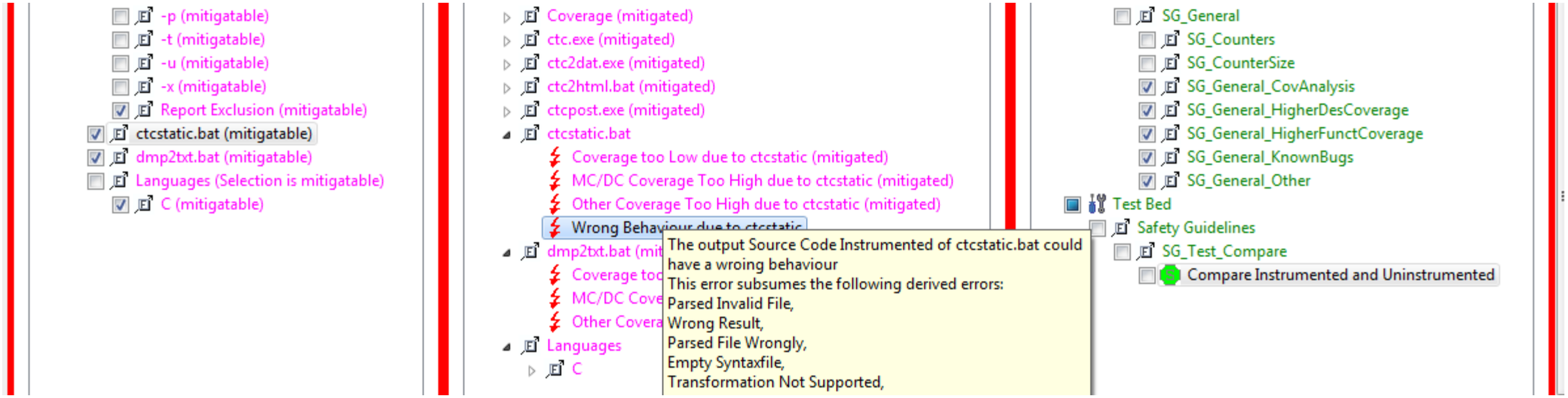
- **Use Case has Features**
- **Features have pot. Errors and known bugs**
- **Errors have Mitigations**
  - Checks
  - Restrictions
- **Status: Next disabled, i.e. not enough mitigations selected**



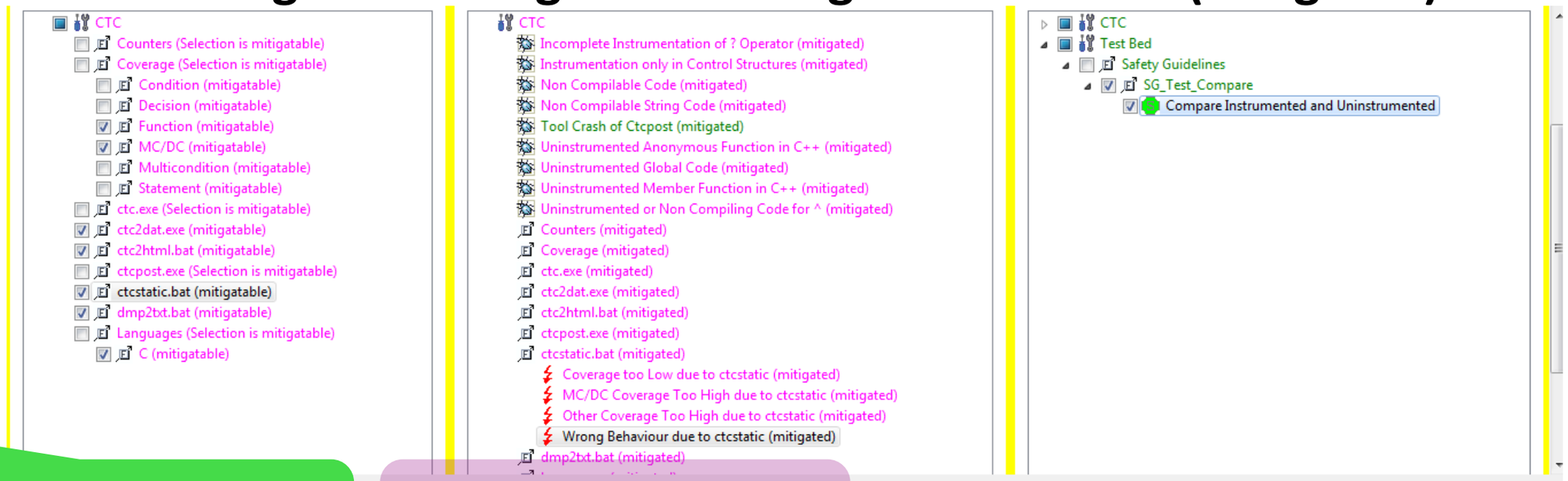
# Configure Use Case: Error Mitigation



- **Select Error: available mitigations get highlighted**




- **Choose mitigation: mitigated errors get marked as “(mitigated)”**

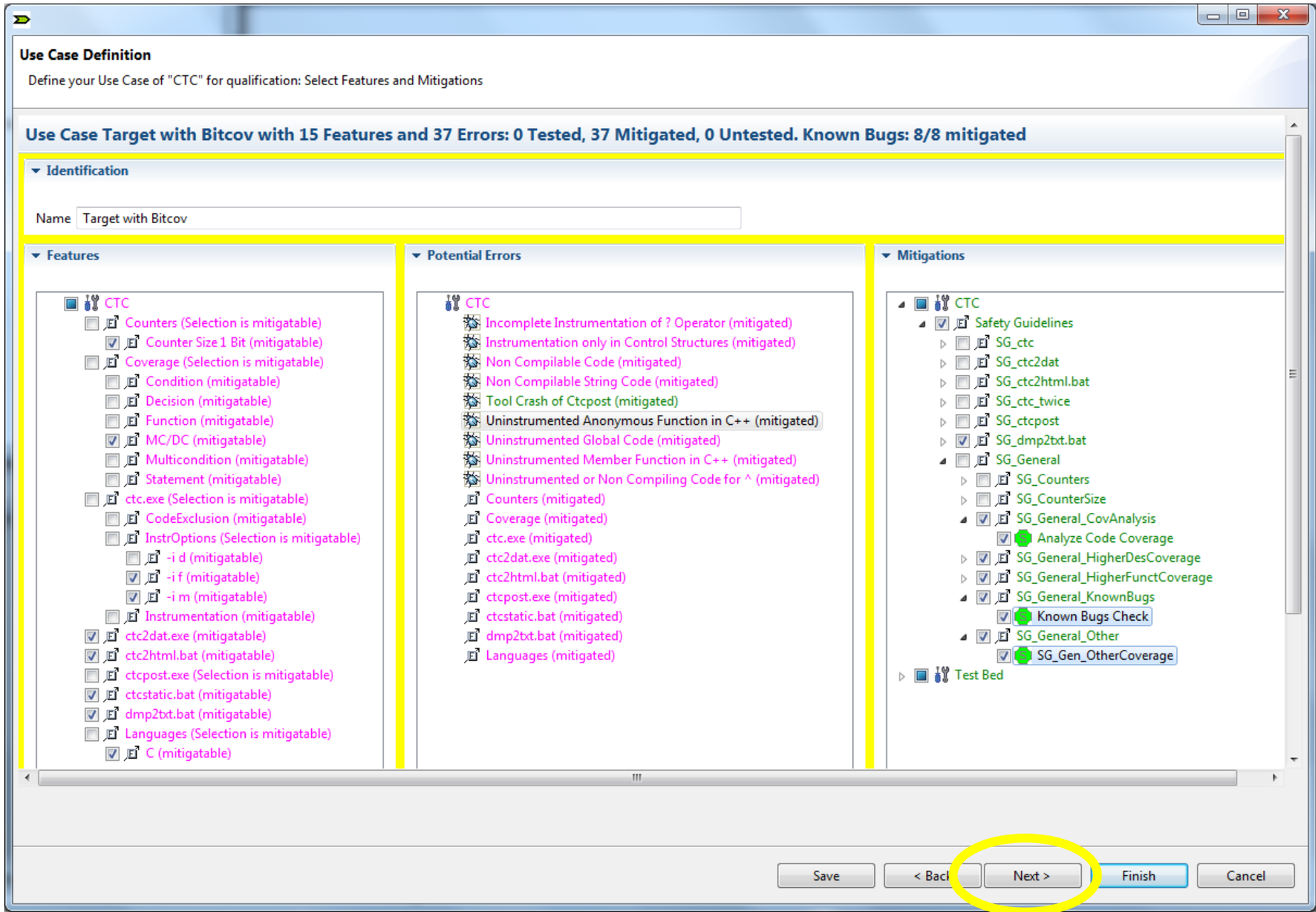



Green Errors are testable and do not need mitigations

Currently no tests available

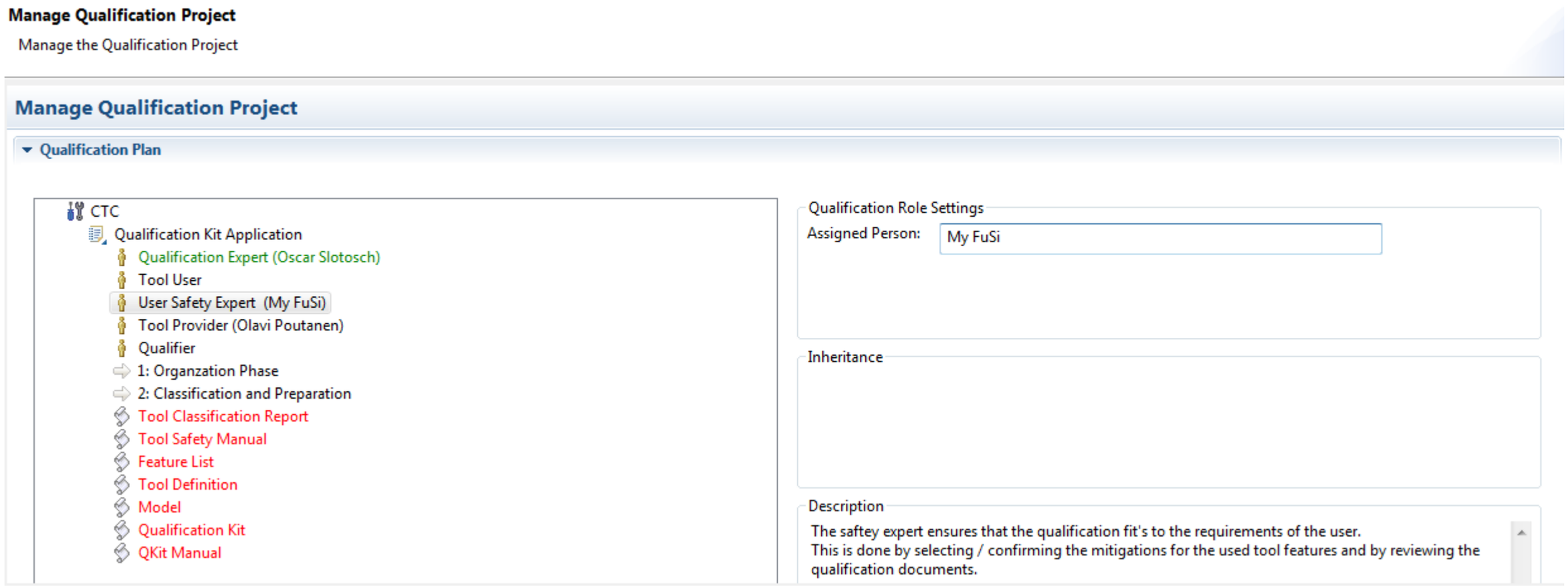
# Use Case: Known Bug Mitigation

- **Mitigate the Known Bugs (like potential errors)**
- **When all untestable potential errors are mitigated, color changes to yellow and “Next” Button is enabled**



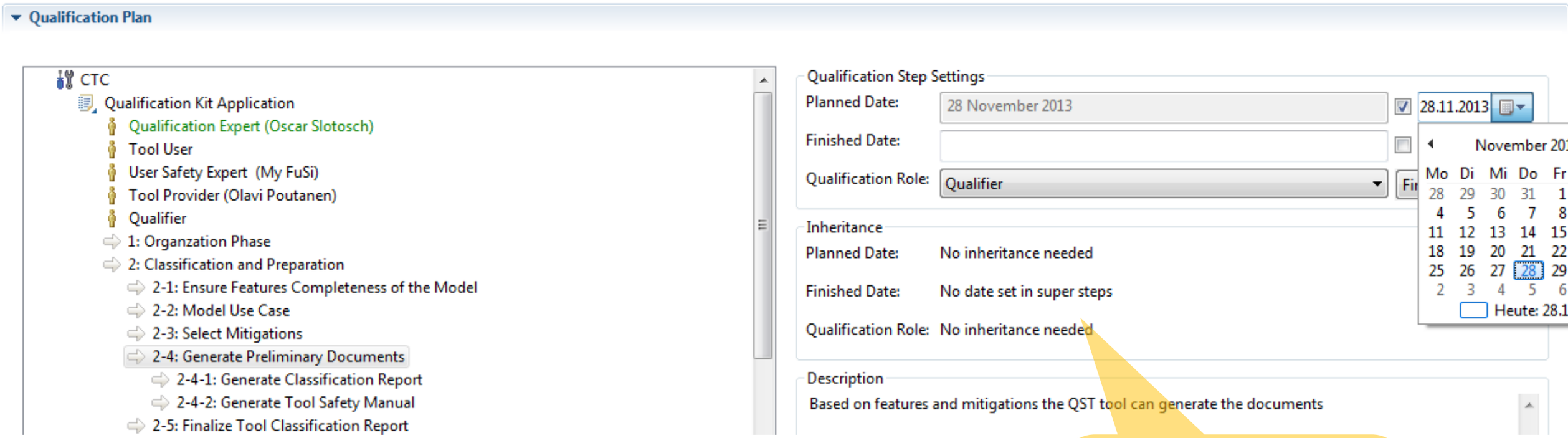
# Optional: Planning of Roles

- Select roles in the Qualification Project (left side)
- Assign persons names (right sides) by entering their names



# Optional: Planning of Steps

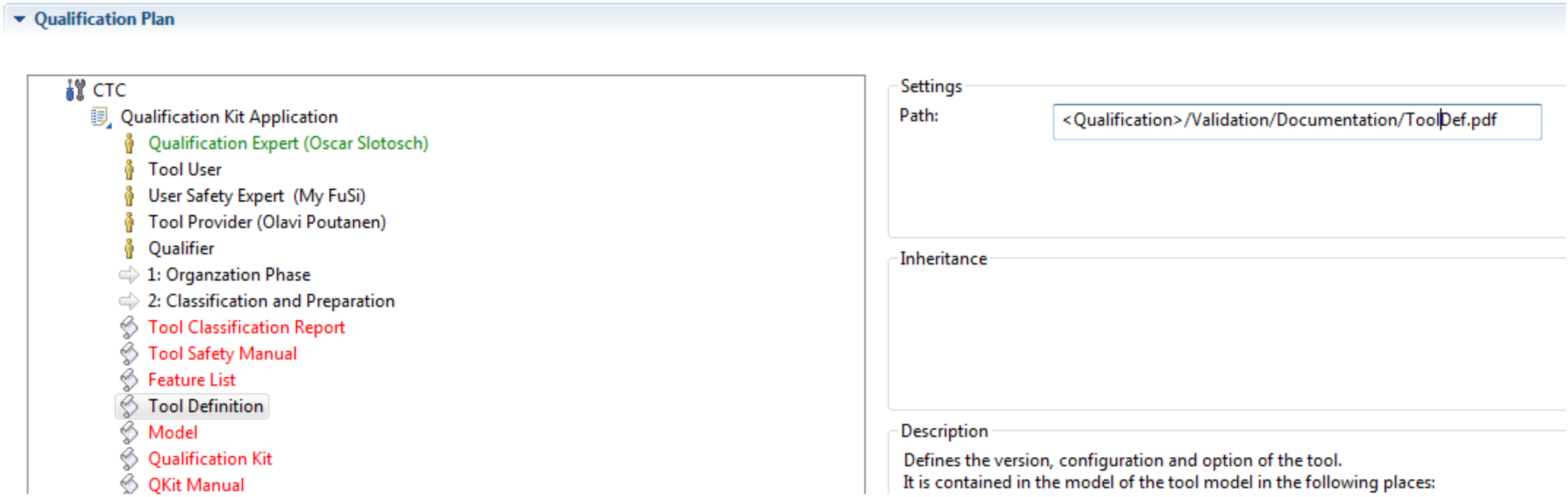
- Select step in the Qualification Project (left side)
- Assign dates (right sides) by entering their values and roles




Steps are hierarchic and can be planned with inheritance, i.e. planning super steps instead of detailed steps

# Optional: Planning Artifacts

- Select Artifacts in the Qualification Project (left side)
- Assign files (right sides) by entering their paths




- Note: the planning can also be done as documentation of the project before extending the Tool Qualification Plan to the Tool Qualification Report

# Optional: QST Summary

- Shows the status and the generated documents

**Qualification Summary for Qualification of CTC**

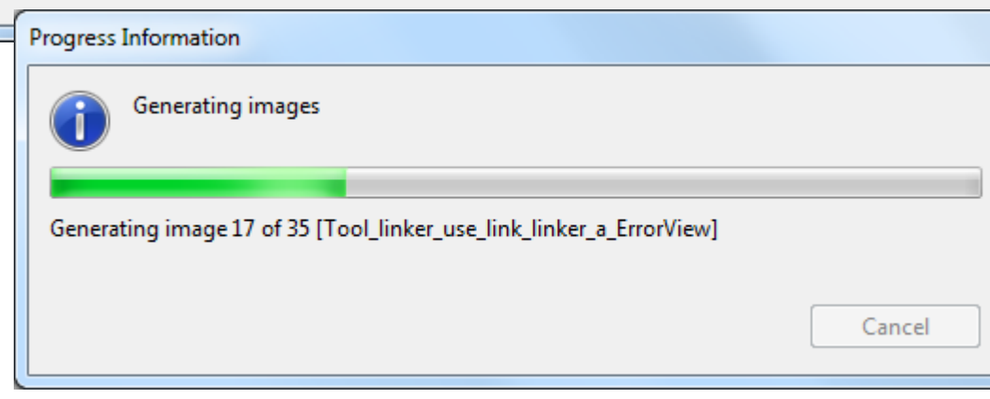
Summarizes the qualification that can be started now by creating the qualification documents of CTC in Target with Bitcov

| | |
|---|---|
| Target Directory | C:\Programme\Qualification\CTCExample |
| Names of Use Cases | Target with Bitcov |
| Number of Features | 18 |
| Number of selected Checks | 6 |
| Number of selected Restrictions | 2 |
| Number of Tests | 0 |

| Name: | Path: |
|---|---|
| Tool Classification Report | C:\Programme\Qualification\CTCExample\Validation\Documentation\TCR.docx |
| Tool Qualification Plan | C:\Programme\Qualification\CTCExample\Validation\Documentation\TQP.docx |
| Tool Safety Manual | C:\Programme\Qualification\CTCExample\Validation\Documentation\TSM.docx |
| Tool Test Plan | C:\Programme\Qualification\CTCExample\Validation\TestExecution.txt |
| Toolchain Model | C:\Programme\Qualification\CTCExample\QKit\Model\Model.tca |

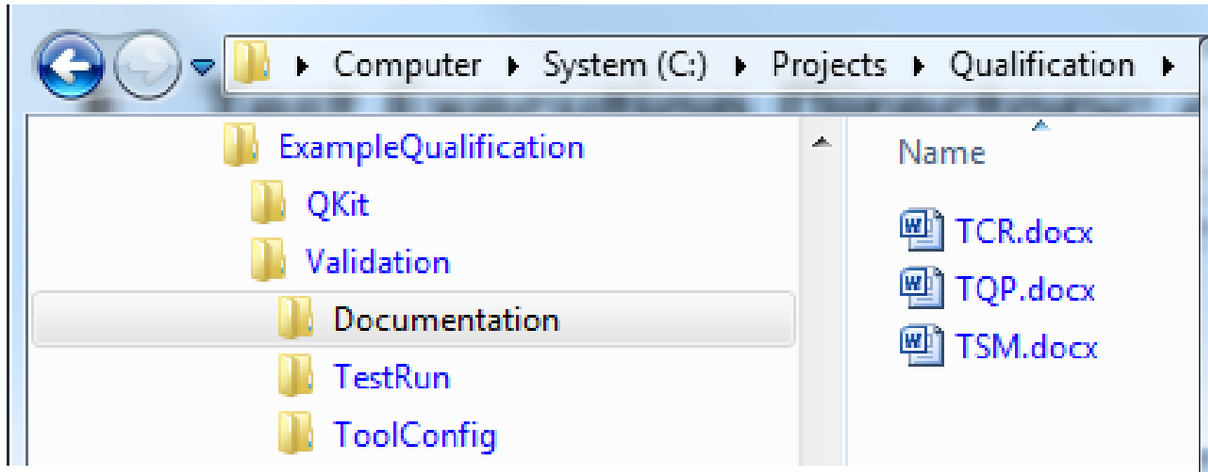
Save | < Back | Next > | Finish | Cancel

- Pressing Finish starts generation of documents

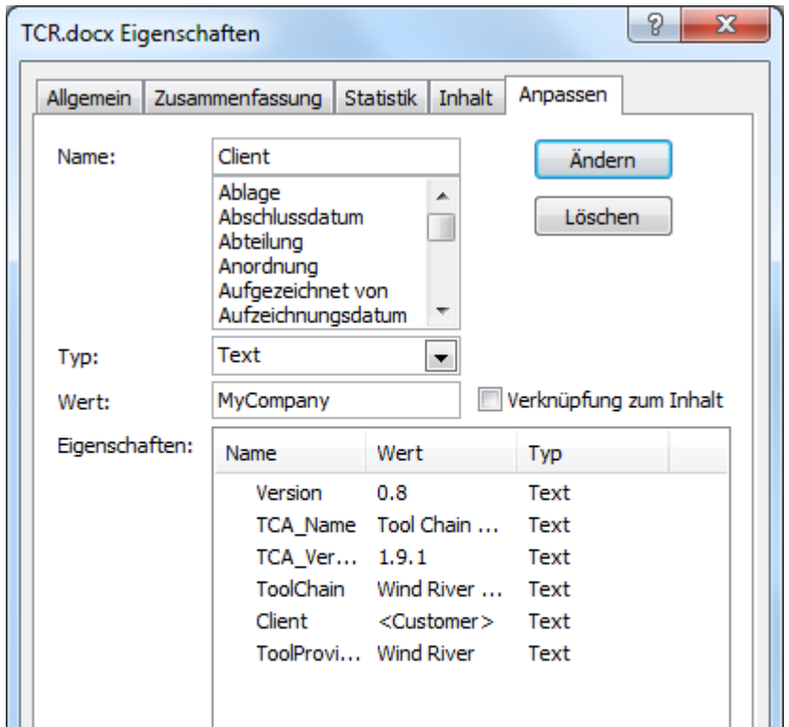


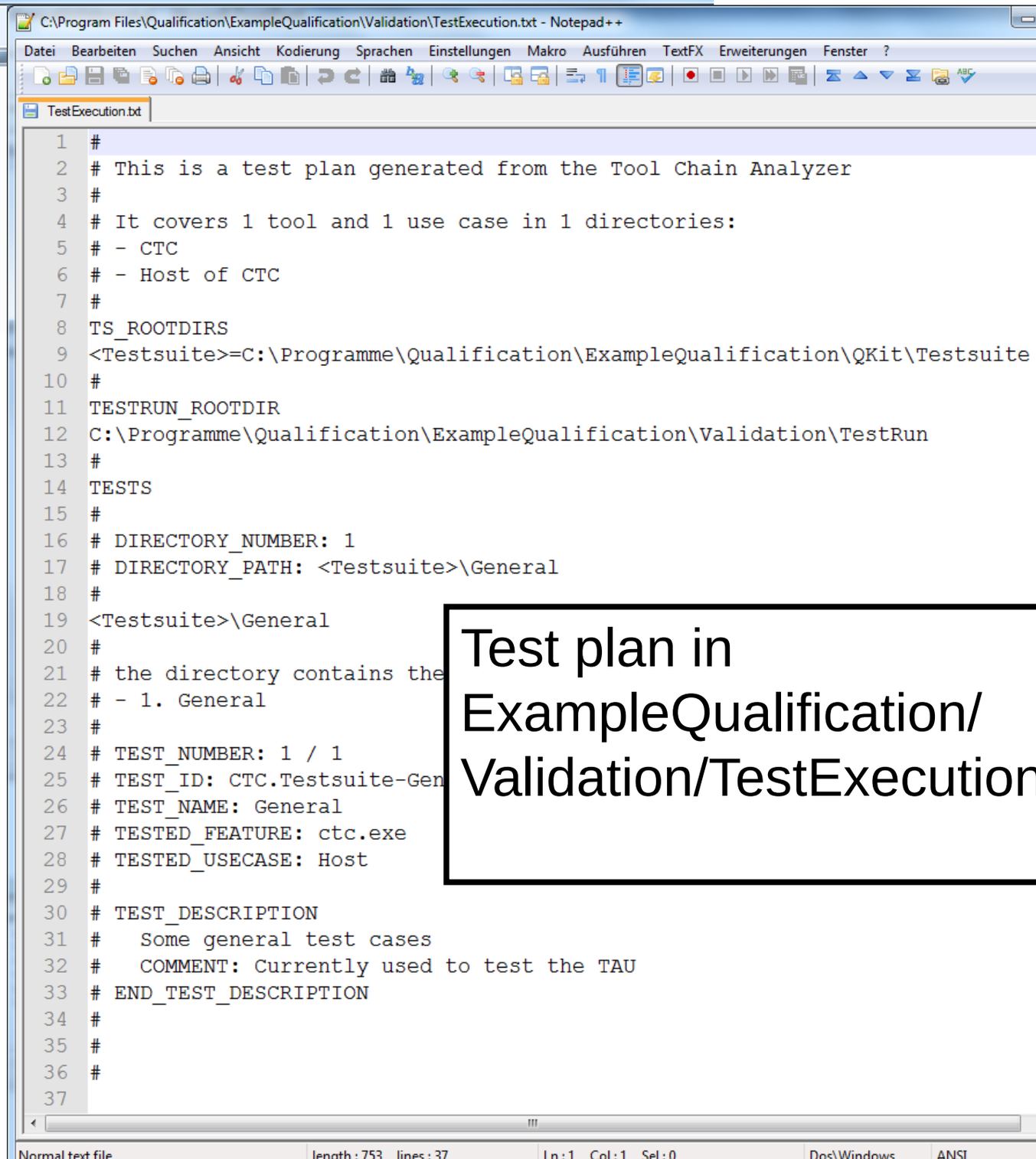
# Generated Documents

- **Qualification Documents**




- **Set the Word variable Client with your company/project name**
- **Update the document (Strg+a,F9)**




Test plan in ExampleQualification/ Validation/TestExecution

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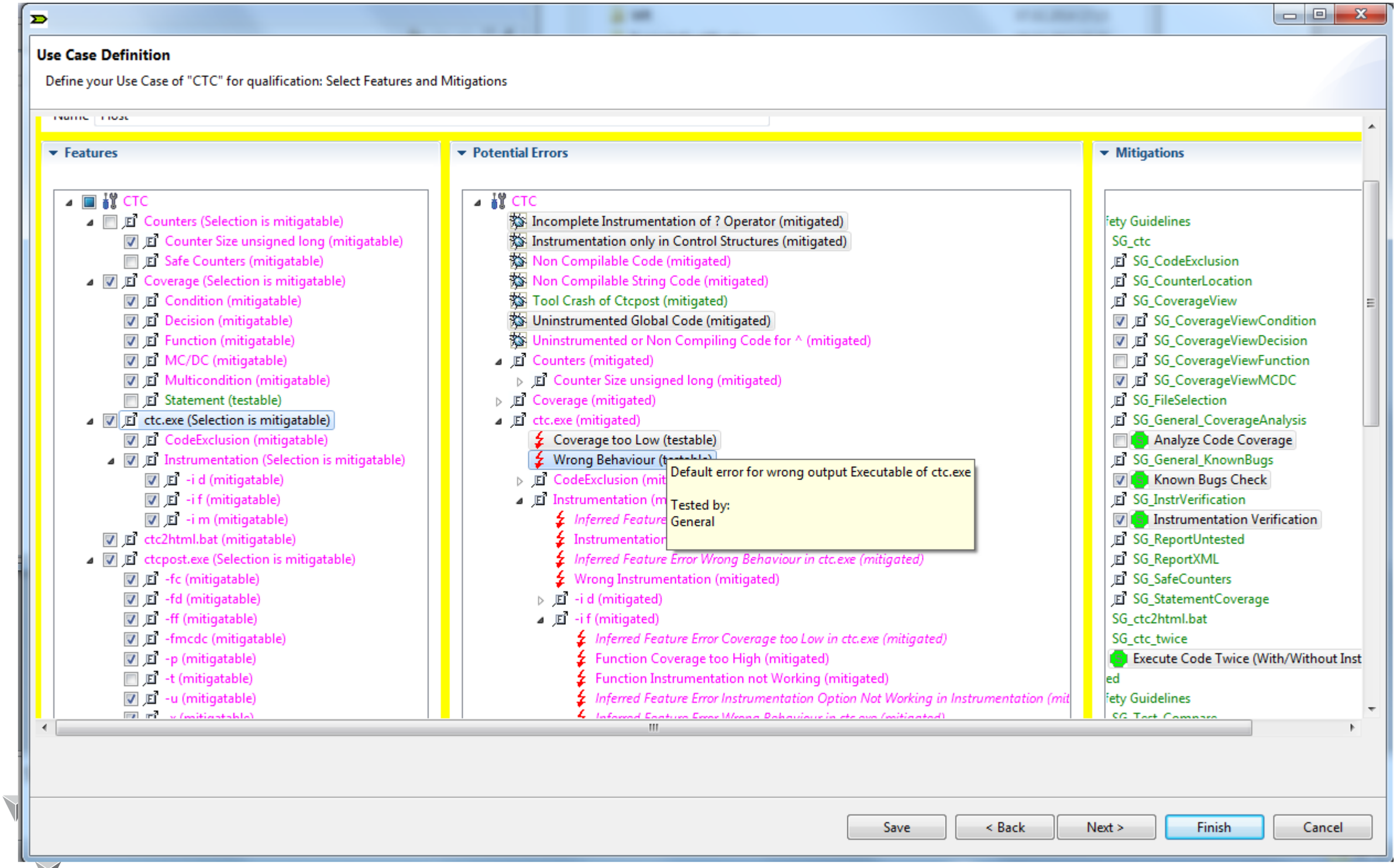
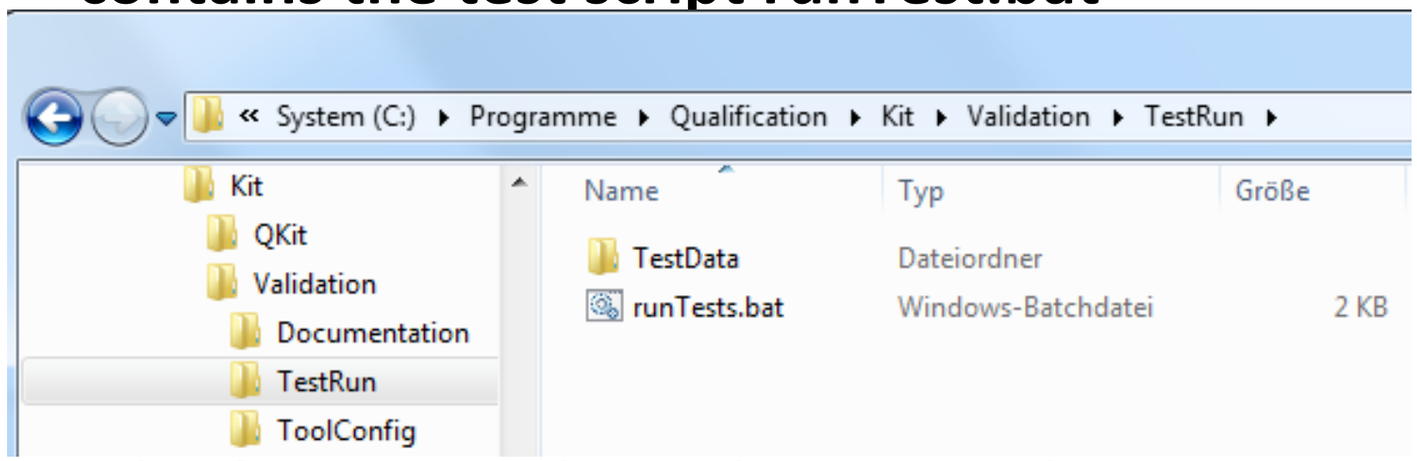
# Test Selection

- Some features are testable (green)

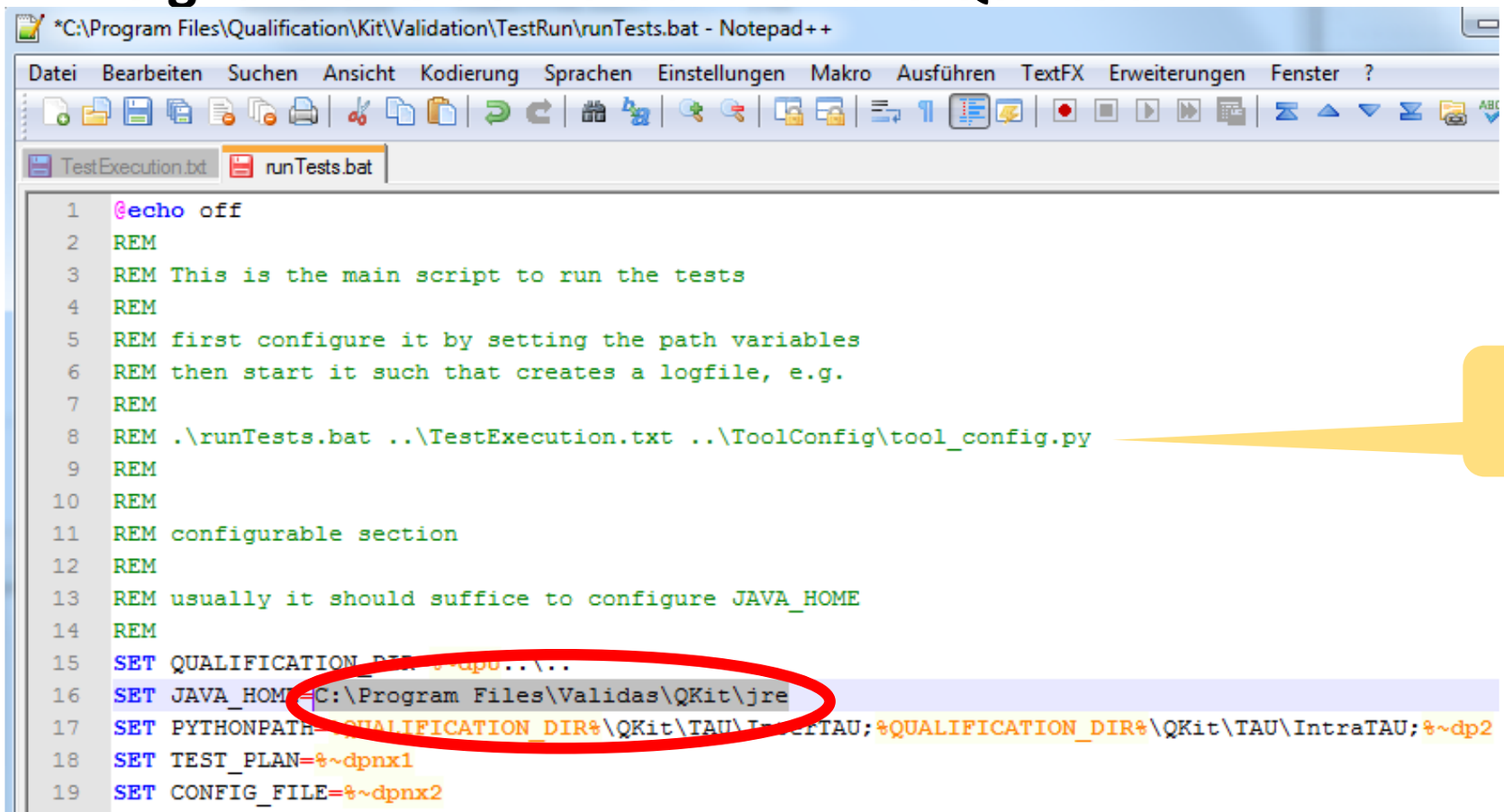


# Test Execution: Configuration

- **Test Execution Directory: ExampleQualification/Validation/TestRun contains the test script runTest.bat**



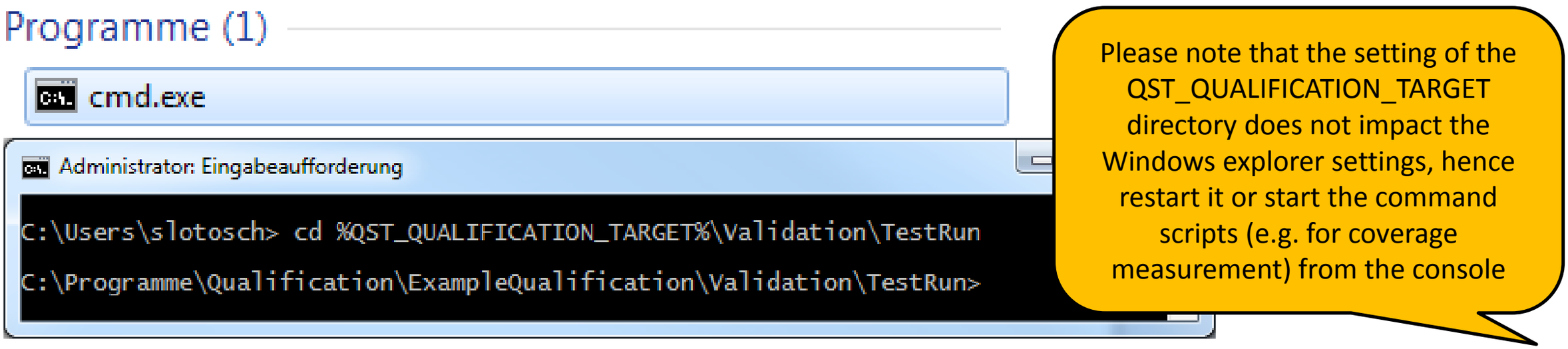

- **Edit the java path inside runTest.bat to a java runtime environment (jre), e.g. the one delivered with the QST tool**




This is the command to start the test execution

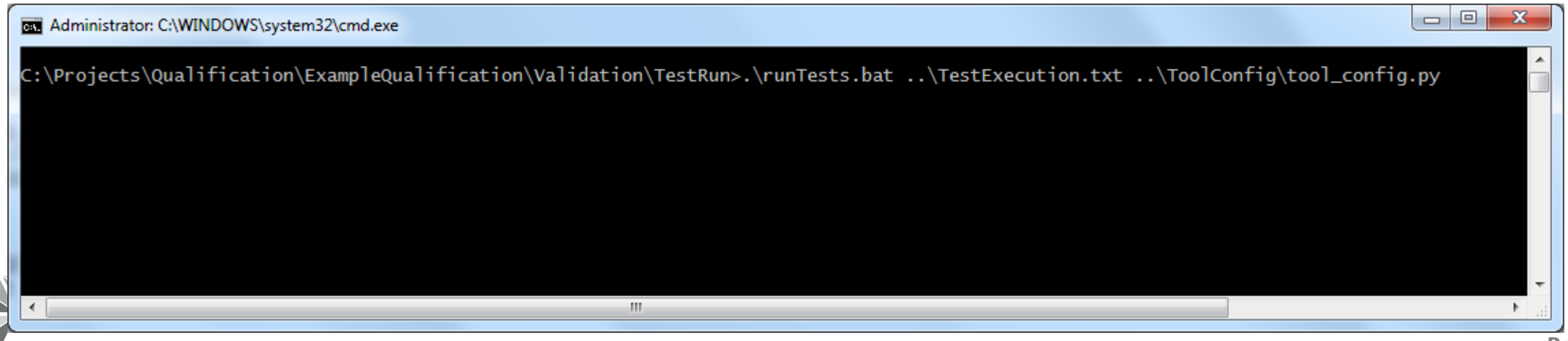
# Test Execution: Run Tests

- **Open a command shell and change into the TestRun directory by cd %QST_QUALIFICATION_TARGET%\Validation\TestRun**




Please note that the setting of the QST_QUALIFICATION_TARGET directory does not impact the Windows explorer settings, hence restart it or start the command scripts (e.g. for coverage measurement) from the console

- **Start the tests by .\runTests.bat ..\TestExecution.txt ..\ToolConfig\tool_config.py**



# Test Execution: Progress

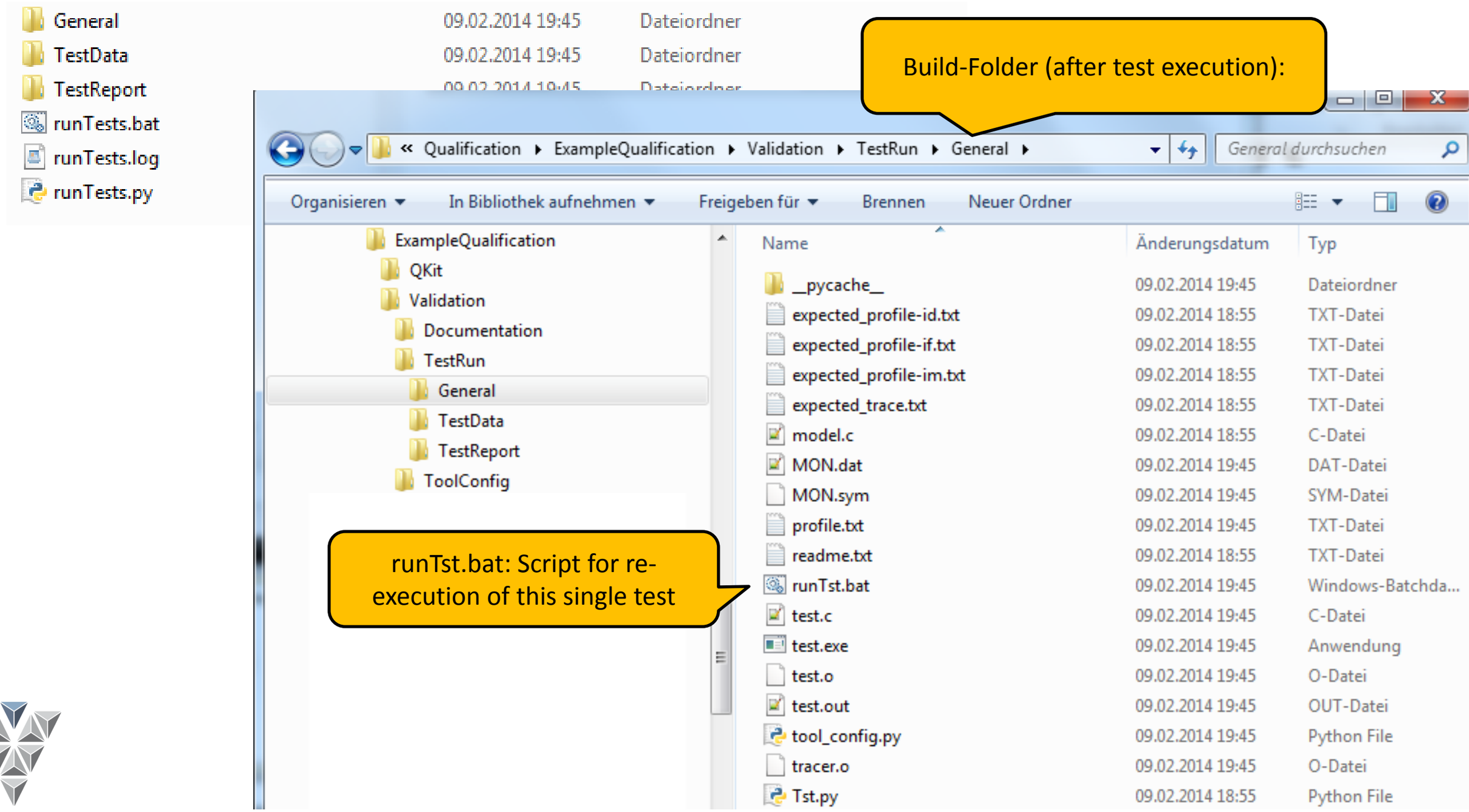
- **Console shows progress of test execution:**
  - Date, times, TAU version, results,…

```
c:\Programme\Qualification\ExampleQualification\Validation\TestRun>.\runTests.bat ..\TestExecution.txt ..\ToolConfig\
tool_config.py
[INTERTAU_VERSION]=[Version 1.13, $Rev: 3430 $]
[INTRATAU_VERSION]=[Version 0.1, $Rev: 554 $]
[TAU_VERSION]=[0.1]
starting tests
09.02.2014
19:45
configuration
[QUALIFICATION_DIR]=[c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..]
[JAVA_HOME]=[C:\Program Files\Java\jre7]
[PYTHONPATH]=[c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\InterTAU;c:\Programme
\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\IntraTAU;c:\Programme\Qualification\ExampleQual
ification\Validation\ToolConfig\]
[TEST_PLAN]=[c:\Programme\Qualification\ExampleQualification\Validation\TestExecution.txt]
[CONFIG_FILE]=[c:\Programme\Qualification\ExampleQualification\Validation\ToolConfig\tool_config.py]
[TOOL_NAME]=[CTC]
cre
cre
imp
Executing job command: "c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\IntraTAU"\t
rexpand.bat model.c > test.c
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: ctc -i m gcc test.c -I "c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\
..\QKit\TAU\IntraTAU" "c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\IntraTAU"\tr
acer.c -o test.exe
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: test.exe > test.out
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: ctcpost MON.sym MON.dat -p profile.txt
STDOUT: STDOUT: b''
STDERR: STDERR: None
[SUCCESS]: testDiffOutFiles
[FAILURE]: testDiffReportFiles: False is not true : Generated and reference coverage files differ.


FINISHED TEST RUN
Stop Time = [2014-02-09 19:45:18.741000]
Duration =  [0:00:02.335000]
```

# Test Output: Logfile and Report

- **Created in TestRun directory:**
  - runTests.log: Logfile
  - TestReport/junit-noframes.html



# Test Report: Overview

Verifysoft TECHNOLOGY

Unit Test Results

file:///C:/Program Files/Qualification/ExampleQualification/Validation/TestRun/TestReport/junit-noframes.html

## Unit Test Results

Designed for use with JUnit and Ant.

| | |
|---|---|
| Tool: | CTC |
| TAU Version: | 0.1 |
| Qualification directory: | c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\.. |
| Java home: | C:\Program Files\Java\jre7 |
| Pythonpath: | c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\InterTAU;c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\IntraTAU;c:\Programme\Qualification\ExampleQualification\Validation\ToolConfig\ |
| Test plan: | c:\Programme\Qualification\ExampleQualification\Validation\TestExecution.txt |
| Config file: | c:\Programme\Qualification\ExampleQualification\Validation\ToolConfig\tool_config.py |
| User: | slotosch |
| Date: | Sun Feb 09 19:45:20 CET 2014 |

### Summary

| Tests | Failures | Errors | Success rate | Time |
|---|---|---|---|---|
| 2 | 1 | 0 | 50.00% | 2.274 |

Note: *failures* are anticipated and checked for with assertions while *errors* are unanticipated.

### Package

| Name | Tests | Errors | Failures | Skipped[0/1] | Time(s) |
|---|---|---|---|---|---|
| General | 2 | 0 | 1 | 0 | 2.274 |

Back to top

### TestCase General

| Name | Status | Type | Time(s) |
|---|---|---|---|
| testDiffOutFiles | Success | | 0.001 |
| **testDiffReportFiles** | **Failure** | **N/A**<br>False is not true : Generated and reference coverage files differ.<br>File "C:\Python32\lib\unittest\case.py", line 370, in _executeTestPart<br>function()<br>File "C:\Programme\Qualification\ExampleQualification\Validation\TestRun\General\Tst.py", line 40, in testDiffReportFiles<br>self.assertTrue(boolOk, 'Generated and reference coverage files differ.')<br>File "C:\Python32\lib\unittest\case.py", line 506, in assertTrue<br>raise self.failureException(msg) | **0.002** |



Properties »

# Test Logfile: TestRun/runTests.log

Verifysoft TECHNOLOGY

- Contains test results and commands to reproduce test

```
STARTED TEST RUN
Start Time = [2014-02-09 19:45:16.406000]

Configuration:
TAU Version: Version 1.13, $Rev: 3430 $
QUALIFICATION_DIR: c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..
JAVA_HOME: C:\Program Files\Java\jre7
PYTHONPATH: c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\InterTAU;c:\Pro
TEST_PLAN: c:\Programme\Qualification\ExampleQualification\Validation\TestExecution.txt
CONFIG_FILE: c:\Programme\Qualification\ExampleQualification\Validation\ToolConfig\tool_config.py

Parsing the test plan: c:\Programme\Qualification\ExampleQualification\Validation\TestExecution.txt...
Finished parsing the test plan successfully.
Removing .xml files from TestData...
----------
Collecting all test files from C:\Programme\Qualification\ExampleQualification\QKit\Testsuite\General
Adding test file C:\Programme\Qualification\ExampleQualification\QKit\Testsuite\General\Tst.py

TESTSUITE_DIR: C:\Programme\Qualification\ExampleQualification\QKit\Testsuite
TESTRUN_DIR: C:\Programme\Qualification\ExampleQualification\Validation\TestRun

Deleting preexisting test run folder C:\Programme\Qualification\ExampleQualification\Validation\TestRun\Gener
Copying test files from : C:\Programme\Qualification\ExampleQualification\QKit\Testsuite\General to test fold
Creating file C:\Programme\Qualification\ExampleQualification\Validation\TestRun\General\runTst.bat

Loaded 2 tests from C:\Programme\Qualification\ExampleQualification\Validation\TestRun\General\Tst.py
Running test package: General.Tst

Executing job command: "c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKit\TAU\Int
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: ctc -i m gcc test.c -I "c:\Programme\Qualification\ExampleQualification\Validation\Tes
STDOUT: STDOUT: b''
```

# Test Analysis: One Test Failed

Verifysoft TECHNOLOGY

- **Logfile message explains**

```
Executing job command: "c:\Programme\Qualification\ExampleQualification\Validation\TestRun\..\..\QKi
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: ctc -i m gcc test.c -I "c:\Programme\Qualification\ExampleQualification\Valic
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: test.exe > test.out
STDOUT: STDOUT: b''
STDERR: STDERR: None
Executing job command: ctcpost MON.sym MON.dat -p profile.txt
STDOUT: STDOUT: b''
STDERR: STDERR: None
[SUCCESS]: testDiffOutFiles
[FAILURE]: testDiffReportFiles: False is not true : Generated and reference coverage files differ.
```

- **From Tst.py:**

```
def testDiffReportFiles(self):
    boolOk=checkutils.diff(strFile1=T_Test.here+r'\profile.txt',
                           strFile2=T_Test.here+r'\expected_profile-im.txt')
    self.assertTrue(boolOk, 'Generated and reference coverage files differ.')
```

# Reports are Different

Verifysoft TECHNOLOGY

profile.txt <-> expected_profile-im.txt - KDiff3

Datei Bearbeiten Ordner Navigation Vergleichsansicht Zusammenführen Fenster Einstellungen Hilfe

A: C:\Program Files\Qualification\ExampleQualification\Validation\TestRun\General\profile.txt

Oberste Zeile 1 Kodierung: System Zeilenende-Kodierung: DOS

```
*******************************************************************************
*           CTC++, Test Coverage Analyzer for C/C++, Version 7.1.1            *
*                                                                             *
*                           EXECUTION PR                                      *
*                                                                             *
*                      Copyright (c) 19                                       *
*******************************************

License_notice:_This_is_a_limited_period_evaluation_copy_license.

Symbol_file(s)_used    : MON.sym_(Sun_Feb_09_19:45:17 2014)
Data file(s) used      : MON.dat (Sun Feb 09 20:00:27 2014)
Listing produced at    : Sun Feb 09 20:00:27 2014
Coverage view          : As instrumented


MONITORED SOURCE FILE : test.c
INSTRUMENTATION MODE  : multicondit

 HITS/TRUE      FALSE     LINE DESCR
===============================================================================

        4                  2 FUNCTION main()
        4          0 -     6   if (tr2 ( 6 , 2 , 1 ))
        4          0 -     7   if (tr2 ( 7 , 4 , 0 ) || ( tr2 ( 7 , 5 , 1 ) || tr2 ( 7 ,
        0            -     7     1: T || (_ || _)
        4                  7     2: F || (T || _)
        0            -     7     3: F || (F || T)
                   0 -     7     4: F || (F || F)
       16          0 -     8     for (;i < tr2 ( 8 , 8 , 5 );)
        4         12      10       if (i == tr2 ( 10 , 10 , 3 ))
        4                 10         break
                          13   else
                          14   L:
        4                 16   return 1
                          17 }

***TER  60 % (  9/ 15) of FUNCTION main()
        94 % ( 16/ 17) statement
-------------------------------------------------------------------------------


***TER  60 % (  9/ 15) of SOURCE FILE test.c
        94 % ( 16/ 17) statement
-------------------------------------------------------------------------------


MONITORED SOURCE FILE : c:\Programme\Qualification\ExampleQualification\Validation\TestRu
INSTRUMENTATION MODE  : multicondition

 HITS/TRUE      FALSE     LINE DESCRIPTION
```

B: C:\Program Files\Qualification\ExampleQualification\Validation\TestRun\General\expected_profile-im.txt

Oberste Zeile 1 Kodierung: System Zeilenende-Kodierung: DOS

```
*******************************************************************************
*           CTC++, Test Coverage Analyzer for C/C++, Version 7.1.1            *
*                                                                             *
*                           EXECUTION PROFILE LISTING                         *
*                                                                             *
*                      Copyright (c) 1993-2013 Testwell Oy                    *
*******************************************************************************


Symbol_file(s)_used___:_host-im.sym_(Tue_Jan_21_08:50:45_2014)
Data_file(s)_used_____:_host-im.dat_(Tue_Jan_21_08:55:51_2014)
Listing_produced_at    : Tue_Jan_21_09:01:23 2014

Coverage view          : As instrumented


MONITORED SOURCE FILE : test.c
INSTRUMENTATION MODE  : multicondition

 HITS/TRUE      FALSE     LINE DESCRIPTION
===============================================================================

        1                  2 FUNCTION main()
        1          0 -     6   if (tr2 ( 6 , 2 , 1 ))
        1          0 -     7   if (tr2 ( 7 , 4 , 0 ) || ( tr2 ( 7 , 5 , 1 ) || tr2 ( 7 ,
        0            -     7     1: T || (_ || _)
        1                  7     2: F || (T || _)
        0            -     7     3: F || (F || T)
                   0 -     7     4: F || (F || F)
       _4          0 -     8     for (;i < tr2 ( 8 , 8 , 5 );)
        1         _3      10       if (i == tr2 ( 10 , 10 , 3 ))
        1                 10         break
                          13   else
                          14   L:
        1                 16   return 1
                          17 }

***TER  60 % (  9/ 15) of FUNCTION main()
        94 % ( 16/ 17) statement
-------------------------------------------------------------------------------


***TER  60 % (  9/ 15) of SOURCE FILE test.c
        94 % ( 16/ 17) statement
-------------------------------------------------------------------------------
```

Different dates

Different number of executions

More Information
(different report options?)

Anzahl der verbleibenden ungelösten Konflikte: 7 (0 davon Leerraum-Konflikte)

# Content

- Overview
- Qualification Method
- Example: First Qualification Steps
  - Installation
  - Qualification Planning
  - Text Execution & Analysis
- **Availability and feedback**

# Trac & Wiki System

- https://opentrac.teststatt.de/tracs/verifysoft/wiki
- Documentation
- Download of Releases & Nightly Builds
- Issue Reporting &Tracking (of the Q-Kit, not CTC)

## Available Reports

| Report | Title |
|---|---|
| {1} | Active Tickets |
| {2} | Active Tickets by Version |
| {3} | Active Tickets by Milestone |
| {4} | Accepted, Active Tickets by Owner |
| {5} | Accepted, Active Tickets by Owner (Full Description) |
| {6} | All Tickets By Milestone (Including closed) |
| {7} | My Tickets |
| {8} | Active Tickets, Mine first |

- Q-Kit users get access to it