**Software Verification & Validation (V&V)**

**Test Case (SWTC) Template**

**for use with**

**ESM Chapter 21, Software, Section SOFT-V&V**

**Usage Notes (delete from final SWTC):**

1. Use of this draft (of a future LANL template) is highly encouraged.
	1. Chapter 21 requires an SWTC but doesn’t not mandate the format, so use of best available template, including this draft, is acceptable.
2. User is responsible for meeting the SWTC requirements of Ch. 21 SOFT-V&V (this template draft has not been verified to contain all necessary steps/information to ensure same).
3. There are template instructions in the last 3 pages of the file (starting ~ page 5).
4. A separate, draft test plan (SWTP) template is also posted with SOFT-V&V.

Suggestions on the template are welcome; please consolidate them and send to P1040@lanl.gov and stdsweb@lanl.gov

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| **1.0 SOFTWARE & Traceability information** |
| **1.1 Software Name and Version** |  |
| 1.2 Software ID (SWID) |  |
| 1.3 Software Test Plan Name and Rev. |  |
| 1.4 Software Requirements Document |  |
| 1.5 Software Design Document (SWDD) |  |
| 1.6 Software Traceability Matrix |  |

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| **2.0** **SOFTWARE TEST CASE (SWTC) DESCRIPTION** |
| 2.1 Summary Description of SWTC |  |
| 2.2 Criteria used for establishing test case | Test requirements and acceptance criteria are based upon specified requirements contained in applicable design documents that provide approved requirements. |
| 2.3 Configuration Item(s) being tested |  |
| 2.4 Description of computer hardware used  | *< description of computer hardware used >* |
| [ ]  n/a | 2.5 Test equipment and calibrations | *< list of test equipment and calibrations >* |
| [ ]  n/a | 2.6 Simulation models used | *< description of simulation models used >* |
| 2.7 Test Conditions required |  |
| 2.8 Required test controls |  |
| 2.9 Traceability to software design requirements. |  |

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| **3.0** **SOFTWARE TEST CASE (SWTC) DETAIL** |
| 3.1 Date of test  | *< date when test was performed >* |
| 3.2 Name of tester or data recorder  | *< name of tester or data recorder >* |
| 3.3 Test Case Steps and Instructions |  |
| 3.4 Ranges of input parameters |  |
| 3.5 Characteristics to be tested |  |
| 3.6 Test requirements and acceptance (i.e., pass/fail) criteria. |  |
| 3.7 Expected Results  |  |
| 3.8 Comparison of test results using alternative methods (e.g., hand calculations, etc.). |  |
| 3.9 Observations of unexpected or unintended results |  |
| 3.10 Testing problems (e.g., issues) | *< description of any testing problems >* |
| 3.11 Results of testing and applicability  | *< results of testing >* |
| 3.12 Action taken in relation to any deviations noted. | *< actions taken for identified deviations >* |
| 3.13 Selective regression testing to detect unintended adverse effects created by software changes. |  |
| 3.14 Acceptance testing performed in the operating environment. |  |

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| **4.0 SOFTWARE TEST CASE (SWTC) REVIEW & APPROVAL** |
| 4.1 As the Responsible Test Acceptance Authority for evaluating SWTC results, I have analyzed and evaluated the test results to verify:1. completeness of results,
2. achievement of test objectives, and
3. conformance to the associated Software Test Plan (SWTP) and SWTC.

I conclude this test case has passed or failed, as indicated. | [ ]  Pass |
| [ ]  Fail |
| 4.2 Comments (as applicable)  |
| 4.3 Responsible Test Acceptance Authority (*Name, Z# [if applicable], Organization, Signature, Date*) |  |

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| **5.0 REVISION HISTORY** |
| 5.1 Rev. | 5.2 Date | 5.3 SWTC Revision Description and Reasons for Revision |
| 0 |  | Initial issue. |
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| **6.0 SWTC ATTACHMENT lIST** |
| 6.1 Att. # | 6.2 Attachment Title |
| 1 | Description of testing evidence. |

 **GENERAL**

This template may be used to implement the software testing requirements of [P1040](https://int.lanl.gov/policy/information-management.shtml), *Software Quality Management* or [STD-342-100](http://engstandards.lanl.gov/ESM_Chapters.shtml#esm21), *LANL Engineering Standards Manual, Chapter 21-Software,* as applicable.Use of this template is not mandatory; other templates or formats may be used.

The governing program (i.e., P1040 or Chapter 21) provides additional definitions and details to support the implementation of all applicable SQA requirements.

For additional information on software testing requirements, see [P1040](https://int.lanl.gov/policy/information-management.shtml), R11, Section 3.9 (for software governed under P1040); [STD-342-100](http://engstandards.lanl.gov/ESM_Chapters.shtml#esm21), *LANL Engineering Standards Manual, Chapter 21-Software* (for software governed under Chapter 21); or contact an SQA representative at p1040@lanl.gov.

**HEADER**

* Enter the Test Case ID and Revision Number for the Software Test Case (SWTC).
* Enter the SWTC Revision (or creation) Date.

**1.0 SOFTWARE & TRACEABILITY INFORMATION**

| **Field** | **Entry Information** |
| --- | --- |
| 1.1 | Enter a summary description of the Software Test Case. |
| 1.2 | Enter the software ID (SWID), as applicable. |
| 1.3 | Enter the corresponding Software Test Plan name and revision. |
| 1.4 | Enter the Software Requirements document name and revision. |
| 1.5 | Enter the Software Design Document (SWDD) name and revision. |
| 1.6 | Enter the Software Traceability Matrix document name, as applicable. |

**2.0 SOFTWARE TEST CASE (SWTC) DESCRIPTION**

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| --- | --- |
| **Field** | **Entry Information** |
| 2.1 | Enter a summary description of the Software Test Case. |
| 2.2 | Enter the criteria used for establishing the test case. |
| 2.3 | Enter the software configuration item(s) being tested (e.g., software code, module, or function names, etc.) |
| 2.4 | Enter the description of computer hardware used for this test case. |
| 2.5 | Enter required test equipment and calibrations. Check the “n/a” box if not applicable. |
| 2.6 | Enter simulation models used. Check the “n/a” box if not applicable. |
| 2.7 | Enter the test conditions required. |
| 2.8 | Enter the required test controls. |
| 2.9 | Describe the traceability to software design requirements (e.g., test case number correlated to design item based on approved requirement, etc.). |

**3.0 SOFTWARE TEST CASE (SWTC) DETAIL**

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| **Field** | **Entry Information** |
| 3.1 | Enter the date the test case was executed. |
| 3.2 | Enter the name of the tester or data recorder, as applicable. |
| 3.3 | Enter complete test case steps and instructions for the tester.  |
| 3.4 | Enter the ranges of input parameters, as applicable. |
| 3.5 | Enter the characteristics to be tested. |
| 3.6 | Describe the test requirements and pass/fail acceptance criteria for this test case. |
| 3.7 | Describe and/or quantify the expected results. |
| 3.8 | Describe the comparison of test results using alternative methods such as hand calculations, calculations using comparable proven programs, or empirical data and information from technical literature. |
| 3.9 | Document any observations of unexpected or unintended results from running the test case. |
| 3.10 | Document any testing problems (e.g., issues), such as incorrect test case instructions. |
| 3.11 | Enter the results of testing and applicability to software acceptance. |
| 3.12 | Document actions taken in relation to any deviations (i.e., unexpected or unintended results). |
| 3.13 | Enter selective regression test steps to detect unintended adverse effects created by software changes. |
| 3.14 | Document acceptance testing performed in the operating environment. |

**4.0 SOFTWARE TEST CASE (SWTC) REVIEW & APPROVAL**

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| **Field** | **Entry Information** |
| 4.1 | The reviewer indicates the pass or fail status of the test case based on the criteria in this box. |
| 4.2 | Enter reviewer comments, as needed. |
| 4.3 | Enter the Name, Z# [if applicable], Organization, Signature, and Date of the test case reviewer. |

**5.0 REVISION HISTORY**

| **Field** | **Entry Information** |
| --- | --- |
| 5.1 | As required, revise the SWTP per the governing document control procedure. Enter the SWTP revision number (or letter). Retain prior revision numbers/letters. |
| 5.2 | Enter the effective date of the SWTP revision (same as header). |
| 5.3 | Enter a summary description of the SWTP revision and the reason(s) for the revision. |

**6.0 SWTC ATTACHMENT LIST**

| **Field** | **Entry Information** |
| --- | --- |
| 6.1 | List of attachments as appropriate. Enter the attachment number or letter. |
| 6.2 | Provide attachment title. |